The 1st International Conference on Safety and Security of the Scientific Applications (ICSSSA)

Will be held at:
Baghdad, Iraq on 26th - 27th September, 2018.
Mustansiriyah University, College of Science

Conference Proceeding

Preface


Dr. Bashar M. Nema

I am happy that our College is organizing an International Conference on Safety and Security of the Scientific Applications from 26–27 September 2018. Tutorials and invited lectures in the field of this conference within and outside the country are arranged for the benefit of researchers.

I hope it will be a forum for the participants to exchange ideas and results of their research. I also understand that our conference encourages Scientists to stimulate them to do further research in their respective fields. This conference also brings all the researchers, academicians and industrialists on a single platform to analyze and discuss the latest problem on Safety and Security. The outcome of this conference will help in dissemination of knowledge in the area of "Safe Scientific Applications".

We also proudly organize the 1st international Conference in this year which is one of the largest conferences of its kind in the nation. It attracts hundreds who come in a variety of fields within different fields, including Biology, Chemistry, Computer science, Physics, Mathematics, and Atmospheric. I wish the conference all the success and the efforts of organizers are to be appreciated, in their endeavor to conduct the conference in befitting manner.

Asst. Prof. Dr. Bashar M. Nema
Dean of College of Science
Mustansiriyah University, 2018

Conference Overview

The first International Conference on Safety and Security of the Scientific Applications (ICSSSA) aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results about all aspects of safety and security of the scientific applications. It also provides the premier interdisciplinary forum for researchers, practitioners and educators to present and discuss the most recent innovations, trends, and concerns, practical challenges encountered and the solutions adopted in the security fields of scientific applications.

Call for Contributions

All honorable authors are kindly encouraged to contribute to and help shape the conference through submissions of their research abstracts, papers and e-posters. Also, high quality research contributions describing original and unpublished results of conceptual, constructive, empirical, experimental, or theoretical work in multi-displinary areas of science and Technology are cordially invited for presentation at the conference. The conference solicits contributions of abstracts, papers and e-posters that address themes and topics of the conference, including figures, tables and references of novel research material.

Conference Aims

- Raising the awareness of the importance of CBRN to the employee in the related fields.
- Introduce the latest programs and plans to achieve the objective of CBRN and identify the extent of support for this activity to increase the coordination in this regard.
- Provide a scientific forum to the researchers in various scientific fields to exchanging ideas, scientific experiences, following-up the latest developments in the safety field, reducing the environmental pollutions and nanomaterials applications.
- Following up the scientific developments and encouraging communication between colleges, research centers and ministries to discuss safe solutions to the urgent environmental problems and try to use them in the service of the society.

Conference Proceedings

All submitted conference papers will be blind peer reviewed by three competent reviewers. The post conference proceedings will be published in Al-Mustansiriyah Journal of Science and the best articles submitted will be selected after the conference to be published in Thomson Reuter's journal. All submitted articles will be indexed in the Google Scholar and have DOI. The conference proceedings book and certificate of presentation will be distributed to the conference participants at the conference registration desk.

Sponsorship

This Conference is sponsored, under the Auspices of the Minister of Higher Education and Scientific Research, by the College of Science - Mustansiriyah University in cooperation with Iraqi Ministry of Health and Environment. The conference would offer a large number of invited speakers from many countries. The Best paper awards will be given for the papers judged to make the most significant contribution to the conference.

Conference Copyrights

Important Dates

All honorable authors are kindly encouraged to contribute to and help shape the conference through submissions of their research abstracts, papers and posters. Also, high quality research contributions describing original and unpublished results of conceptual, constructive, empirical, experimental, or theoretical work in multidisplinary areas of science and Technology are cordially invited for presentation at the conference. The conference solicits contributions of abstracts, papers and posters that address themes and topics

of the conference, including figures, tables and references of novel research material.

Deadline for Abstract Submission	1st June, 2018
Notification of acceptance	15th June, 2018
Deadline of Full paper submission	1st July, 2018
Conference Dates	26th - 27th September, 2018

Conference Management

The conference is registered and managed by the online Technical Committee member Ms. Rana M. Elewe Al Salman using EDAS conference system. The conference online website is: http://icsa.uomustansiriyah.edu.iq.

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Invited Speakers

Prof. Dr Munther Hussain Al Kadhimi	Professor of Immunology, King's college London and Hospital.	London, UK
Dr. Kadhim Ayyal Hamdan	Acting chairman of INMA, Iraqi national Monitoring Authority	Iraq
Asst. Prof. Dr. Munther S. Shuker	College of Health & Medical Technology	Iraq
Prof. Dr. Ahmad Kamel Hegazy	Professor of applied ecology and environmental sciences. Department of Botany and Microbiology, Faculty of Science, Cairo University.	Egypt
Prof. Dr. Yong Lei & Dr. Huaping Zhao	Group of Applied Nano-Physics (Fachgebiet Angewante Nanophysik), Institute of Physics, Technical University of Ilmenau.	Germany
Prof. Dr. Hamza Abbass Al-Sewadi	Software Engineering Dept., Faculty of Information Technology, Isra University.	Amman, Jordan
Prof. Dr. Jamela H. Soud	College of Science, Mustansiriyah University	Iraq

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First Section:

Chemical, Biological, Radiological and Nuclear Defense (CBRN).

Invited Speaker Lecture

Lecture: Workplace health and safety standards

Dr. Munther H. Al Kadhimi

Both safety and security is to protect the assets (whether a person or an organization) by creating safe, secure, risk-free condition. Safety measures that are adopted to safeguard people working can be used on different machines (biological, chemical and X-rays exposure). Most of the policy and guidelines adopted in the past in health services are the only measures to secure the safety in hospital and biological and chemical lab rather than standards established by international organization.

The standards usually are aimed at directors, managers with health and safety responsibilities, health and safety professionals and trade union safety representatives. They describe the principles, which provide the basis of effective health and safety management; set out the issues, which need to be addressed; provide links to the relevant guidance; and can be used for developing improvement programs, self-audit or self-assessment.

However the international standards set up by ISO that provides the basis of effective health and safety management to the patients care are poorly practiced. Complying to these standards is a specific legal requirements by ISO to legalize organization to provide safe services. On other hand, employers will have effective health and safety polices in place.

Whatever management approach is used, it needs to and systemic and should contain the following steps to make essential improvement:

- Plan: Say what you want to happen.
- Do: Make sure there are system in place to provide the tools and equipment to do the job.
- Check: make sure the work is being done safely.
- Act and learn: Listen to problems and success and make improvement.

Complying to Standards is secured by using quality tools such as performing risk assessment and audit system are essential to secure safety measures that are complying to standards i.e., Safety is free from harm and faults.

My talk will focus on two areas 1- The standards can be used by boards to scrutinize compliance with health and safety legislation.2- future safety polices derived from practicing ISO standards.

Prof. Dr Munther Hussain Al Kadhimi
Professor of Immunology, King's college London and Hospital, London, UK.

Lecture: CBRN Risk Mitigation Centers of Excellence Initiative (COE)

Dr.Kadhim A. Hamdan

CBRN is an acronym for chemical, biological, radiological, and nuclear materials that could harm the society through their accidental or deliberate release, dissemination, or impacts. The term covers all chemical, biological, radiological and nuclear materials Including dual-use and other materials (hazardous materials). The EU Centres of Excellence on Chemical, Biological, Radiological and Nuclear Risk Mitigation, launched in 2010, is an initiative of the European Union (EU). The initiative addresses the mitigation of and preparedness against risks related to CBRN materials.

The CBRN CoE network is currently present in more than 50 partner countries across the globe, grouped around eight CBRN CoE Regional Secretariats, located in the different regions) including the Center of Excellence in the Middle East hosted by Jordan/ Amman, which includes Iraq, Jordan and Lebanon).

The main objective of the EU CBRN CoE Initiative is to facilitate regional cooperation in order to enhance CBRN capabilities. Partner countries will benefit from the activities of the CBRN CoE Initiative in a variety of ways, including, reinforcement of National CBRN policies, National needs addressed through specific projects/resources and Maximization of existing capacities in the regions. Many projects have been completed and a series of other projects are currently supported within the framework of the CBRN CoE Initiative. They target via a bottom up approach specific needs identified regarding CBRN risk mitigation. This includes matters such as export control, illicit trafficking, border monitoring, bio-safety and bio-security.

The Iraqi government welcomed the establishment of Center of Excellence in the Middle East and stressed the importance of establishing this center and supporting the Iraqi government. In April 2013, the Ministry of Foreign Affairs directed to establish communication and coordination between INMA and EU Center of Excellence. The Iraqi National Monitoring Authority for Nonproliferation (INMA) was designated as a national focal point with this center and national authorities.

Dr.Kadhim Ayyal Hamdan
Acting chairman of INMA,
Iraqi national Monitoring Authority

Lecture: Effect of Smart Devices on Eye Amblyopic and Method of Physical Treatment

Dr. Munther S. Shuker

Weakness in the strength of the eye because of the lack of full natural optical maturity or the lack of eye use in the stage of eye growth in the child and usually one eye is called amblyopia.

Which is a common condition of children and according to global statistics up to 4% of the total world population?

But now shows amblyopic in young people because misuse of smart devices for long periods of more than 4H in conclusive, causing problems for the eye and need them to glasses up to 2D.

is that there is no cure eye amblyopia for more than 10 years ago, But A new method of treatment was found in terms of ages, time of closure and improvement of the power of sight or VA or both in each session.

Asst. Prof. Dr. Munther S. Shuker
Colleges of Health & Medical Technology

Reseach Articles

1. ### Future Effects and Impacts of Biometrics Integrations on Everyday Living

Amjad A. Ahmed
Imam Al-Kadhum University College for Islamic Sciences, Iraq.
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Abstract: Identification and access has been a concept that has evolved over time as the need to constantly identify people and grant them access to sensitive and classified data and information became very important. The effect is felt in most organizations, especially multinational companies that deal in highly classified research that has to do with pharmaceuticals, technology, power as well as the human biology coupled with security. The most common form of implementation of biometrics is facial recognition, fingerprints, iris recognition, retina scanner and voice recognition into so many applications and scenarios. The integration of this biometrics has had a rising effect and impact of everyday life and has practically changed some daily routines. This paper will examine future integrations of biometrics and it will in time affect everyday life and routine.

Keywords: biometrics, fingerprints, facial recognition, voice recognition, iris, retina, identification, authentication, verification.

2. ### Improving an illumination system in the microscopic imaging of nuclear tracks using light emitting diode

Saja F. Hassan[1], Iman T. Al-Alawy[2], Hazim G. Daway[3]
[1]Physics Department, Education College, Mustansiriyah University, [2]Physics Department, Science College, Mustansiriyah University. [3]Physics Department, Science College, Mustansiriyah University, Iraq.
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***Abstract*:** In this study, images vision of nuclear tracks was increased using two methods. The first is to design a new light system based on Light-Emitting Diodes (LED) light instead of traditional fluorescent light used in the optical microscope. Due to the high dynamic range of

the LED light, a high vision and an extra number of tracks were obtained during shooting. The second method is to establish a new scale depended on counting nuclear tracks. That is called No-Reference Image Quality Assessment Based on Wavelet Transform (NIQWT) scale. The quality of captured images was evaluated and no-reference scales like Entropy of First Derivative (EFD), Average Gradient (AG), the Measure of Enhancement by Entropy (EMEE), and (NIQWT) were calculated to be recommended. Then a good correlation coefficient was obtained for these scales. The best correlated coefficient 0.7870 was for (NIAWT) scale. Whereas, the statically results illustrated photography when using LED light much better than Florescent light in the optical microscopy. Therefore, these processes led to augment numbering of nuclear tracks discovered.

Keywords: image quality assessment; nuclear tracks; CR-39 detector; LED light; wavelet domain**.**

3. Isotopes Inhalation Rate

Israa K. Ahmed
Information &communication Department, College of information Engineering, Al-Nahrain University, Iraq.
*Contact: esraa_nuc_med@yahoo.com

Abstract: The results of this research showed by measuring the radius of samples unprecedented mentioned that the metered rate of radioisotopes may be very fast in some of them and in the other medium or it may be slow Compared with the results (ICRP 60 119) where the results showed that the radius of the samples ranged between (0.963μm_0. 145μm) with energy"9.60E-9Sv / Bq-'1.20E-7Sv / Bq at inhaling rate too fast or medium or slow the inhalation of radioactive isotopes may be caused some diseases, the most serious is lung cancer.

Keywords: inhalation Rate, NORM, TENORM, Heavy elements.

4. Attitudes of Biological Waste Management Among a Sample of Academic Personnel Working in Baghdad

Lamia Y. Mohammed, Raghad H. Sanyi, Izzat A.S. Al-Rayahi
College of Health and Medical technology, Middle Technical University, Iraq.
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Abstract: Biological waste generated through the activities of teaching and research laboratories pose a threat to human health and the environment if not treated and disposed of appropriately. Biosafety and biosecurity of academic and teaching facilities is maintained when the appropriate guidelines for the safe management of biological waste is implemented. Biological waste is a potential source of infections and occupational hazards. Previous studies assessing the awareness of some academic and technical laboratory staff working in Iraq has identified gaps in the awareness of the recommended procedures associated with biological and clinical waste disposal. This study was aimed to determine the awareness and attitude of laboratory staff towards biological waste practices and management policy.

A closed end questionnaire was distributed among a number of laboratory staff working in universities in Baghdad and the results were analyzed. Although waste disposal procedures were followed at some degree, but a wider implementation of appropriate waste disposal procedures is necessary. No satisfactory segregation or classification of biological waste was noticed. The results of this study identified the need for each laboratory to have its own code of practice and policy for the management of biological and clinical waste generated in the laboratory. The various biological wastes such as clinical samples, tips, tubes, etc., should be classified and an appropriate waste disposal procedure should be outlined for each category.

Intensive biosafety training programs to all laboratory personnel and frequent monitoring is recommended.

***Keywords*:** biosafety, waste management, clinical waste, segregation.

5. Determination of Radon concentration in some of cosmetics by using RAD-7 detector

Alyaa H. Abass, Entesser F. Salman
Department of Physics, College of Science, University of Babylon, Iraq.

Abstract: Radon is a naturally occurring radioactive gas found in soils everywhere. It is unique among radioactive elements because it is the only one that occurs as a gas. This allows movement up through the soils and cracks in rocks until the gas escapes into the atmosphere. In the atmosphere it is very dilute.

The present study presents an overview of the distribution of radon (^{222}Rn) activity concentration in in eight cosmetics samples from different origins in Hilla city/ Iraq by using alpha-emitters registrations that emitted from radon gas in Durridge RAD-7 radon-in-air monitor, using RAD- H_2O technique with closed loop aeration concept.

The value ranged between (1.43 Bq.L-1) for Blossom lotion sample and (1.45 Bq.L-1) for Remove makeup, the rate reaches about (1.438 Bq.L-1).

The present work all cosmetics samples were with lowest concentrations of radon gas than the allowed limit from International Commission of Radiation protection (ICRP) agency.

Keywords: Radon concentration, cosmetics, Durridge RAD-7, Hilla city.

6. Calculation of Optimum time exposure of Ultraviolet Radiation for different seasons at Baghdad City

Ahmed A. Hameed [1], Firas S. Basheer [2]*
[1]Technology, Directorate Space & Communications, Ministry of Science & Technology, Iraq.
[2]Mustansiriyah University, College of science, Department of Atmospheric Sciences, Iraq.
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Abstract: Ultraviolet radiation is the major risk factor for most skin cancers, where too much exposure to the UV light carries deep health risks, including pigmentary changes, skin cancer and wrinkling. Aims this study is focused to calculate exposure times which cause to skin damage (one minimum erythemal dose) and the optimal time for exposure to sunlight that is needed to receive adequate UV for vitamin D production, without inducing erythema at Baghdad city. In this study, calculating the annual and seasonal optimal time for exposure of Ultraviolet radiation and maximum exposure time for causes skin burns in Baghdad depending on the Fitzberk classification assuming normal ozone conditions throughout the year by using Ultraviolet radiation data received from French site for Solar radiation data (SODA) in the period 1/1/2005 to 31/12/2017. The greatest time for exposure to solar radiation to create vitamin D without skin burns was 16min in winter, 6min in spring, 5min in summer and 9min in autumn, While the greatest exposure time to solar radiation that causes burns is 80min in winter, 32min in spring, 22min in summer and 46min in autumn. It was find the number of days per UV Index level was found in one year (2015) were low level 8days, Medium level 74days, High level 68 days, Very High level 93days, while the Extreme level was 127days. So, it is important to consider exposure to solar radiation especially in the summer in the city of Baghdad.

***Keywords*:** Ultraviolet Radiation, Ozone, pigmentary changes, Skin Cancer, Skin Burns, Vitamin D, Solar radiation.

7. Multivariate Analysis of Toxic Heavy Metals Contents in Soil Detected by Laser Induced Breakdown Spectroscopy

Tagreed K. Hamad[1], Hussein T. Salloom[2], Alaa J. Ghazai [1]*
[1]Physics Dept. Science College, Al-Nahrain University, Iraq
[2]Al-Nahrain Nanorenewable Energy Center, Al-Nahrain University, Iraq
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***Abstract*:** Concentrations of Cr, Pb, Cu, Zn, Cd and Ni in soil samples gathered from different cities in Iraqi were estimated via laser induced breakdown spectroscopy (LIBS). A total of 14 composite soil samples were collected at depths 0-10cm, including green areas, urban parks and industrial residential districts. Qualitative and quantitative analysis of the samples were achieved by using the locally developed LIBS set up equipped with Q-switched Nd:YAG laser and optical spectrum analyzer. To validate the analysis results, Atomic absorption spectrometry (AAS) was used to analyses the samples as well. PCA was utilized to identify possible sources of detected metals. Concentrations of heavy metals (HMs) in samples were found to decrease with increasing of the distance of the communities from the pollution sources. The results of the multivariate analysis showed Cr, Cu, and Ni concentrations is controlled by gas stations, while Pb, Zn, Cd, and Mn in examined soil are mainly affected by deposits from cement factories. The lowest concentrations of heavy metals were observed in agricultural areas far from the main sources of contaminations.

***Keywords*:** Toxic heavy metal; multivariate analysis; soil; laser induced plasma.

8. Ergonomics in Dentistry

Nadia Aftan
College of Dentistry, University of Baghdad

Abstract: Ergonomics is the study of human performance and workplace design in order to maximize health, comfort and efficiency in dentistry.
Ergonomics in dentistry, aims to create safe, comfortable and productive workspaces by bringing human abilities and limitations into the design of a workspace, including the individual's body size, strength, skill, speed, sensory abilities (vision, hearing), and even attitudes.

Keywords: Ergonomics, workspace, dentistry.

Second Section:

Controlling Of the Environmental Pollutions and Their Treatment Methods.

Invited Speaker Lecture

Lecture: Control of Environmental Pollution: Life Cycle and Environmental Biotechnology Solutions Concepts for Sustainable Development

Dr. Ahmed K. Hegazy

In recent decades, there has been significant shift from pollution control to pollution prevention within the production systems. Most recently the cleaner production concept is concerned with the prevention rather than the control of pollution within all production life cycles in different sustainable development sectors. Therefore, pollution prevention and cleaner production approaches benefit the society and the environment. Economically these approaches reduce the costs and generate profit, and consequently ensure sustainable development. This vision of the control of environmental pollution as based on life cycle and applications of environmental biotechnology for sustainable development is presented in some 50 power point slide presentation covering the addressed key points. This plenary lecture provides general insights into the major concepts and approaches of environmental pollution and the applications of environmental biotechnology in pollution reduction and/or elimination, and bioremediation or rehabilitation of polluted ecosystems.

The key points to be addressed cover: (1) Life cycle approach and pollution control; (2) Eco-efficiency and sustainable development; (3) Environmental impact assessment and best practice approaches for environmental sustainability and sustainable development; (4) Applications of environmental biotechnology in pollution control- case studies; (5) Pollution and environmental security; (6) Cleaner production and pollution prevention; (7) ISO standards and environmental management systems- ISO 14000 series; and (9) Research challenges and priority areas.

For effective control of environmental pollution, the highest priority better be focusing on preventing pollution through source reduction and reuse approaches. Elimination of pollutants at or near the source is less expensive than treating or disposing the waste and ensures cleaner environment. Application of environmental biotechnology in pollution control offers environmentally sound technologies and economically viable cost for ecosystem management that ensure environmental security for sustainable development and promotion of social stability.

Prof. Dr. Ahmad Kamel Hegazy
Professor of applied ecology and environmental sciences. Department of Botany and Microbiology, Faculty of Science, Cairo University, Egypt.

Reseach Articles

9. Biosynthesis, Characterization and Removal Efficiency for Petroleum Leakage of the Cofe2o4 Nanoparticles

Haydar M. MUHY
PhD. Erciyes University, Institute of Science, Kayseri – Turkey
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Abstract: Magnetic nanoparticles are widely used in areas such as biosensors, data storage devices, waste water treatment and biomedicine due to their biocompatibility and low toxicity. In this study, biosynthesis of the $CoFe_2O_4$ nanoparticle (NP) was carried out using the bark extract of *Aesculus hippocastanum* plant as a reducing and capping agent. Synthesized NPs were characterized by ultraviolet-visible spectrophotometer (Uv-Vis.), Dynamic Light Scattering (DLS), zeta load, X-Ray Dust Diffraction (XRD), Fourier Transformed Infrared Spectroscopy (FT-IR), Scanning Electron Microscopy, Raman, BET, and Thermogravimetric Thermal Analysis (TGA). The Lethal dose value (LD_{50}) and the crude oil removal efficiency were examined. The characteristic light absorption of the $CoFe_2O_4$NP has been measured at 330 nm, surface charge of +14.4 mV, mean size of 75 nm and effective diameter of 432 nm. The XRD analysis revealed that the particle structure was in the cubic spinel structure with functional groups bound by FT-IR analysis and Raman data. It has been noted that the $CoFe_2O_4$NP, which was synthesized by biological method, can remove a 78.5% of the crude oil from the contaminated water. It has been determined that the NP's have a low toxic effect on *D. magna* (LD_{50}= 728.267 ppm). In this study, it has been suggested that the $CoFe_2O_4$ NP with *A. hippocastanum* bark extract could be synthesized by a cheap, relatively easy and environmentally friendly method which used for purification of contaminated water bodies.

Keywords: Aesculus *hippocastanum*, $CoFe_2O_4$, Biosynthesis, Crude oil treatment, *Daphnia magna*, lethal dose.

10. Effect of Wastewater in the Euphrates Water Quality in Western Iraq

Mahmood A. Al-shaheen[1], Ethar M. Al-Othman, Mustafa R. Al-Shaheen[2], Mohammed R. Al-Shaheen
[1]University of Anbar, Iraq, College of education for girls.
[2]University of Anbar, Iraq, College of agriculture.
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***Abstract*:** The Euphrates river water pollution were studied by remnants of wastewater in Western Iraq at November 2016 to June 2017 to implement this purpose it was collected 408 samples from seventeen stations (six stations of the wastewater and eleven station of river water) by three samples from each station. The research will be covers some measurements of water properties (temperature and electrical connectivity and total dissolved and dissolved oxygen and the hydrogen), other measurements were measured at laboratory. The results of a study showed that the average electrical connectivity (physical properties) which amounted to 3172 maikrosmnz/cm and Turbidity (11.73 NTU) had exceeded allowable limits while the average concentration of suspended solids (9.10 mg/l) It is within the permitted while the average concentration of dissolved salts (1612.73 mg/l) exceeding the allowable limits in accordance with national and international standards. The average total residue (4679.96 mg/l) has exceeded the allowable limits nationally and globally.

11. Pathogenic Microorganisms Detection in Tap Water in Basra City Treated Within Ultraviolet Radiation

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***Abstract*:** Tap water samples were collected from various areas of the Governorate of Basra including the areas (Al-Saybah, Abu Al-Khasib, AL-Zubair, AL-Medina, Al-Asmai, AL-Ashiar (AL-Timemeia), AL-Juwenena, and Al-Burjeseah). Samples were collected in May to June, 2017. The results were recorded for isolate and identified bacteria from tap water. Six types of microbes were found in the examined samples with frequencies reach to 50 colonies, *Bacillus, E. coli, Klebsiella, Candida, Staphylococci, and Hyphae fungi*. The study shows that, the area of AL-Asmai was most polluted of microbes than other area while the Abu-AL-Khasib was less polluted.

Samples of contaminated water were treated using short wave –Germicidal (UV-C) light to kill or inhibit microbial growth. The results were discussed and analyzed.

***Keywords**: Pathogenic microbes, tap water, occurrence, short wave- Germicidal Ultraviolet-C radiation*

12. Antibacterial Activity of Synergistic Effect of Colicin and Gold Nanoparticles against Klebsiella Pneumonia.

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***Abstract*:** Fifty of urine samples were collected from patients with urinary tract infection (UTI). The samples were collected from Al-Yarmuk hospital in Baghdad. All of the isolates were diagnosed using biochemical test and vitek. The result showed that 30 (60%) isolates identified as E.coli from 50 urine samples. The colicinogenic isolates were determined using cup assay methods. The results showed that 10 out of 30 isolates (33.3%) were detected as colicin producers from 30 isolate identified as E.coli depending on the clear zone that observed against the sensitive isolate. Colicin was extracted from the efficient isolate. Colicin activity (320 U/ml) was determined by well assay method. The protein concentration (520 µg /ml) estimated by using Bradford assay. The watery extract of Chilli papers (Capsicum baccatum) was extracted and used it as reducing and capping agent for gold nanoparticles synthesis. The characterization of the gold nanoparticles was done by UV-Visible Spectrophotometer, Transmission Electron Microscope (TEM), and resulting spherical nanoparticles with diameter ranging between (35-70 nm). The antibacterial activity of colicin alone and gold nanoparticles alone and combination of colicin with gold nanoparticles against ten isolates Klebsiella pneumonia isolated from urine samples, using tube method. The results showed that all the three treatment had antibacterial activity but the combination of gold nanoparticles and colicin is better than used each one separately.

Keywords: Colicin, gold nanoparticles, Chilli papers, antibacterial

13. Effect of ZnO nanoparticles, Fullerene (C60) and Pyocyanin on Imipenem resistant Gram- ve Bacteria Isolated from Hospital Environment

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Abstract: The resistance of bacteria from hospital environments has been less frequently investigated. Twenty -seven gram-negative bacterial isolates were isolated and identify from the hospital environment. The isolates were *Acinetobacter baumanii* (16 isolates), *Pseudomonas aeruginosa* (4 isolates), *Enterobacter cloacae* (3 isolates) Klebsiella *pneumoniae* (3 isolates) and *Escherichia coli* (one isolate). Antimicrobial susceptibility test was performed by disk diffusion method and polymerase chain reaction was used to detect *bla*NDM-1 genes among imipenem-resistant MBL positive isolates. The results show that the all isolates were imipenem-resistant , cefotaxime resistance was seen in 48.14% of isolates, ciprofloxacin resistance rate was 11.11% , and 25 isolates (92.5 %) were inferred to be MBLs producers. Among these isolates, 11 isolates showed had *bla*NDM-1 genes.

The antibacterial effect of ZnO nanoparticles, Fullerene (C60) and pyocyanin against various bacterial isolates from hospital environment was investigated. The results showed that pyocyanin is the best effective one for inhibition of the growth of all type of bacteria. The nanoparticles reduced the growth of *A.baumanii* and *Enterobacter cloacae* higher than that with *Pseudomonas aeruginosa* and *Klebsiella pneumonia.* It was concluded that nanoparticles and pyocyanin have potential as a therapeutic agent against gram-ve bacteria from the hospital environment.

Keywords: Nanoparticles, pyocyanin, Fullerene (C60) , hospital environments.

14. Closed Loop System Synchronization of Quantum Dot Semiconductor Lasers with Optical Feedback

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Abstract: In this work a systematic study on Close - Loop System occurring in the rout to chaos observing in integrated of quantum dot semiconductor lasers with optical feedback .The time delay of the feedback has been chosen in order to provide suitable condition for intermittent dynamics. The effect of long and short external cavity of QDSL on synchronization in a closed –loop system are studied under an enhancement factor of $(\alpha = 3.5)$ value by solving the set of 6-rate equation.

***Keywords*:** close-loop system, Quantum dot, semiconductor laser, optical feedback, linewidth enhancement factor.

15. ## Two Mathematical Processes Ecological Friendly of the Fourth Derivative and Compensated the Area under the Curve Spectrophotometric Methods Used For Analysis Meloxicam in the Market Tablet Formulation

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Abstract: Two Rapid, direct, ecological friendly and economical spectrophotometric methods were used for estimation of meloxicam in the market tablet dosage form. The First method is based on the used the fourth order derivative spectrum (D4) and the second method is depended on the ratio of the area under the curve for the two peaks in the drug (CAUC). The linear calibration graph of the two methods were measured in the concentration range (5-35) mg/l and the average of recoveries for market formulation (AWA) ® were 99.785% for D4 method and 100.249% for CAUC method which indicating a good accuracy and precision for these methods. In this study, distilled water was used as a solvent for the drug to reduce pollution in analytical measurements; the results obtained by these suggested methods have been successfully statistically compared by t-test and Mann-Whitney test showed a good agreement.

Keywords: meloxicam; D4; CAUC; spectrophotometric; Mann-Whitney test.

16. ## Subtilosin Prevents Biofilm Formation by Inhibiting Bacterial Quorum Sensing

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***Abstract*:** Subtilosin, the cyclic lantibiotic protein produced by *Bacillus subtilis* KATMIRA1933, targets the surface receptor and electrostatically binds to the bacterial cell membrane. In this study, subtilosin was purified using ammonium sulfate ($(NH_4)_2SO_4$) precipitation and purified via column chromatography. Subtilosin's antibacterial minimum and sub-minimum inhibitory concentrations (MIC and sub-MIC) and antibiofilm activity (biofilm prevention) were established. Subtilosin was evaluated as a quorum sensing (QS) inhibitor in Gram-positive bacteria using Fe(III) reduction assay. In Gram-negative bacteria, subtilosin was evaluated as a QS inhibitor utilizing *Chromobacterium voilaceum* as a microbial reporter. The results showed that *Gardnerella vaginalis* was more sensitive to subtilosin with MIC of 6.25µg/mL when compared to *Listeria monocytogenes* (125µg/mL). The lowest concentration of subtilosin, at which more than 90% of *G. vaginalis* biofilm was inhibited without effecting the growth of planktonic cells, was 0.78µg/mL. About 80% of *L. monocytogenes* and more than 60% of *Escherichia coli* biofilm was inhibited when 15.1 µg/mL of subtilosin was applied. Subtilosin with 7.8–125 µg/mL showed a significant reduction in violacein production without any inhibitory effect on the growth of *C. violaceum*. Subtilosin at 3 and 4 µg/mL reduced the level of Autoinducer-2 (AI-2) production in *G. vaginalis*. However, subtilosin did not influence AI-2 production by *L. monocytogenes* at sub-MICs of 0.95–15.1 µg/mL. To our knowledge, this is the first report exploring the relationship between biofilm prevention and quorum sensing inhibition in *G. vaginalis* using subtilosin as a quorum sensing inhibitor.

Keywords: Quorum sensing. Biofilm inhibition. Subtilosin. *Gardnerella vaginalis*

17. Isolation and Identification of Bacteria Isolated from Soil that Can Degrade 3–Chloropropionic Acid

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Abstract: 3-Chloropropionic acid (3-CP) belongs to the class of chlorinated monocarboxylic acid or β-chloro substituted haloalkanoic acid. It is considered as a chemical inclusion in pesticides and herbicides, this compound is carcinogenic and genotoxic to the animal and human. However, it can be degraded into harmless substances by using both non-biological and biological pathways in which the latter more economical, safer and environmental friendly. For that particular reason, it will be interesting to investigate and study by isolation and identification a bacterial strain that could degrade 3-CP as its sole carbon source and energy. In this work, a strain of dehalogenase producing bacteria capable of utilizing 3-CP was successfully isolated from soil sample of abandoned agricultural land. This bacterium was characterized by using 16S *rRNA*, current results of MEGA6 phylogenetic also supported the strain belongs to *Pseudomonas* sp.WH3 as well as biochemical analysis confirmed that the strain WH3 was *Pseudomonas* sp. so the characterization of the biochemical properties and 3-CP dehalogenation efficiency of the isolated microorganisms were successfully carried out. The bacteria grew well at 37°C in media containing 10 mM 3-CP but exhibited a rather slow doubling time of 20 h, utilization of 3-CP was confirmed by detection of chloride ion released using halide ion assay technique for the strain which indicate their ability to degrade 3-CP. with an optimum chloride ion release 0.186 μmol Cl^-/mL. Strain WH3 showed a 99% sequence identity to *Pseudomonas* sp. This bacterium can be considered as a bioremediation agent to cleaning pollution environments caused by β-halogenated compounds.

Keywords: β-haloalkanoic acid, 3-chloropropionic acid, biodegradation, bioremediation, *Pseudomonas* sp.

18. Antioxidant Enzyme Responses of Juncusaschers. (ET Buch.) Adams To Some of Environmental Stresses and Use It as Indicators

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Abstract: Reported in this paper response of antioxidant, The catalase (CAT), ascorbate peroxidase (APX), superoxide dismutase (SOD) and peroxidase activity (POD) of JuncusAschers. as a scavenger of ROS for mitigating the environmental stress. The study was deal with monthly study of eighteen physico-chemical parameters during the period from February 2016 to June 2017, and 4 sites were selected from Baher Al-Najef Depression at the Al-Najef Al-Ashraf city /Iraq , The results showed positive correlation between air and water temperature, and positive correlation between annual precipitation with DO, EC, TDS,TSS , SAL, HCO 3 = , CO 3 - , Cl - ,SO 4 = and pH , While BOD,PO 4 = and NO 3 = showed negative correlation . During the course of sampling the physico-chemical factors were found significantly higher in the second position compared to the other site. In spring, higher pollutants concentration than in winter season. This led to high activity of antioxidant enzymes. Present experiment indicated that in a stressed ecosystem, the JuncusAschers.

Plants overcome the stress by altering their stress enzyme activities, hence suggesting an evidence of adaptive mechanism to thrive in a stressful environment and suitability of JuncusAschers for environmental matrices (as indicators), especially under altered climatic conditions.

Keywords: JuncusAschers. Environmental stress, Antioxidant enzyme, catalase (CAT), ascorbate peroxidase (APX), superoxide dismutase (SOD) and peroxidase activity (POD).

19. Antimicrobial Activity of Freshwater Cyanobacterium *Westiellopsis Prolifica*

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***Abstract*:** The acetone and hexane of cyanobacterium *Westiellopsis prolifica* extracts were examine efficiency against pathogenic bacterial and fungal strains by using two motheds as agar well diffusion method and The turbid metric method (tube method) against three Gram positive bacteria " *Staphylococcus aureus , Bacillus subtilis, and Streptococcus sp*. " and three are Gram- negative bacteria "*Shigella sp., Proteus sp.* and *Pseudomonas aeruginosa*" in additions two isolates of fungi "*Aspergills niger* and *Candida albicans*". The result showed crude aceton extract for *W. prolifica* better than that of the haxene extract and more efficient on negative gram Bactria than positive gram bacteria. In agar well diffusion method The result evaluated that *W.Prolifica* acetone extract has the highest antibacterial activities against *Streptococcus sp*., *S. aureus* and *A. niger* with the inhibition zones of (20) mm in addition the inhibition diameter Restrict between(15-10) mm with other bacteria and fungi.Whil tube method showed that acetone extract the highest inhibition in *A. niger* (0.263) nm and less inhibiting in C. *albicans*(0.330).then Purification of the aceton extracted was made on silica gel column chromatography .Among the five groups extracts, Group 2 (Benzene 50ml) was selected and analysed byGC-MS which identified the presence of main components in the extract as alcohols, acids, monoterpene Eucalyptol),hydrocarbons (undecane) and aromatics like: Para- Xylene and 1,2,3 trimethyl benzene, Phytol, n-Hexadecanoic acid, etc. These purified active compounds take part into broad horizons in the field of biotechnology and pharmacy.

***Keywords*:** Antimicrobial activity; Active compound, cyanobacteria, *Westiellopsis prolifica*

20. Physicochemical and bacteriological properties for evaluation Tigris water pollution in several areas of Baghdad

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Abstract: For studying the physicochemical and bacteriological properties of the surface water of the Tigris river in Baghdad, water samples were tested for their total colifom count (TC), thermotolerant coilforms (TTC), total dissolved solids (TDS), total suspended solids (TSS) biochemical oxygen demand (BOD), chemical oxygen demand (COD), Temperature and pH values. Total colifom count (TC), thermotolerant coliforms (TTC) results showed a significant difference at $P<0.05$ when compared with Fresh water quality standard limit fecal coliform.

The bacteria isolated during this study were *Aeromonas hydrophila, Escherichia coli, Strreptococcus faecalis, Strreptococcus* faecium, *Enterobacter cloaca, Enterobacter aeroenes* and *Klebsiella oxytoca*.
Army canal (point 1) was the highest point with COD, TSS and TDS (significant difference at P<0.05) while Adamyia (point 1) was the highest point with BOD (significant difference at P<0.05). pH values of Tigris river varied from 6.22 to 6.51. While the temperature values varied from 24.39 to 26.61. Comparing the levels of the physicochemical constituents (TDS, TSS, BOD, COD,.) with the Global levels values showed that the water of Tigris river exceeded the recommended level for surface water quality. It was inferred that the Tigris River is polluted and its aquatic biota is bacteriologically contaminated and unsafe for human and animal consumption.

21. Histopathological Study of Infection with helminthic parasites Intestinal of some Tigris River Fish passing through Tikrit City in Iraq

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Abstract: A total of 100 fish samples were collected from Tigris river at Tikrit city, during the period from September 2017 to March 2018. These fishes were belonging to ten species which were *Alburnus sellal, Arabibarbus grypus,Carasobarbus luteus, Coptodon zillii, Cyprinus carpio, Cyprinus kais, Leuciscus vorax, Luciobarbus Xanthopteru, Mystus pelusius* and *Silurus triostegus*. The results revealed infection with four species of worms including three cestoda *Eubotherium salvelini, Schyzocotyle acheiognathi* in *cyprinus carpio* with percentage of infection(5.2, 10)% respectively and *Ligula intestinalis* in *Coptodon zillii* with percentage of infection (9)%. *One specie* acanthocephala *(Neoechinorhynchus zabensis)* in *Arabibarbus grypus* and *Carasobarbus luteus* with percentage of infection(20, 5.8)% respectively. In this study also recorded two new hosts including *Eubotherium salvelini* and *Ligula intestinalis* were recorded the first in Iraq. The present study included the histopathological changes on the intestine which infected with parasitic worms (acanthocephalan, cestoda). It has been differentiated the intestinal villi appeared with epithelial degeneration and cellular debris in the luman of intestinal, also the basement membrane of this epithelium was displaced from the core of villus, cavitation in muscular layer, complete sloughing of epithelium in intestinal cavity and white blood cells infiltration especially in lymphocyte cells.
Keywords: Tiger fish, Worms, histopathology, cestoda.

22. Design and Simulation of Exhaust Pollution Monitoring Sensor Based on Photonic Crystal Fiber

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Abstract: Many critical issues appear due to the exhaust gases from transportations facilities, electric generators, industries, and so on. This lead to air pollution, which could be define as an introduction of biological materials or chemicals that's causes harm to all living organism including humans. Also damaging the environment of earth. The principal gases that cause air pollution from these sources are nitrogen oxides (NO, NO_2 and N_2O) and carbon oxides (CO and CO_2). There is a need to develop sensors that are characterized by highly-sensitive and miniaturize that capable of real-time analytes detection; optical fiber sensors agree with these needs. In this work, Large Mode Area- Polarization Maintaining Photonic Crystal Fiber

(LMA-PM-PCF) for exhaust gases monitoring have been proposed to detect air-polluted gases over a wide transmission band covering (1µm) to (2µm) wavelength. Different guiding properties had been studied for the infiltrated PCFs. According to simulated results, the high relative sensitivity is obtained for sample infiltrated with CO gas; The higher sensitivity makes this fiber a potential candidate to detect CO that is commonly known as silent killer.
Keywords: Exhaust air pollution, Nitrogen oxides, Carbon oxides PCF sensors, FEM.

23. Fuzzy Logic Inference Index to Assess the Water Quality of Iraqi Rivers

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Abstract: This study aimed to develop a new water quality index for routine assessment of the river water quality for drinking purpose based on fuzzy logic artificial intelligence method. Four water quality variables were involved in light of their significance to Iraqi waters, these parameters are biological oxygen demand, and total dissolved solids, total hardness, and fecal coliform. Fuzzy logic inference system with specific rules was developed by Matlab software using Mamdani fuzzy logic Max–Min inference system method. To evaluate the performance of this new fuzzy water quality index (FWQI), tests were conducted using the Iraqi standards for drinking water quality and the 2017 data set of Tigris River within Baghdad.
Results revealed the FWQI ability to assess the water quality of Tigris River during the period of the study and that the method of fuzzy inference system was a simple, valuable and applied water quality evaluation tool for human drinking water of Iraqi rivers.
Keywords: Water quality index, Iraqi Rivers, Fuzzy logic.

24. Reusing Iraqi Construction and Aggregates Waste to Manufacturing Eco-Friendly Polymer Concrete

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Abstract: The recycling and reusing of waste materials to produce suitable materials is very important subjects to scientific research in world now, because the decrease natural resources and create a hole or risk in future of the world. The aim of our research to produce polymer concrete (PC) has high mechanical and physical characteristic. This PC was prepared by using the waste of aggregates and demolitions to make PC have good mechanical and physical characteristic with low cost as compared as cement concrete. In this research different types of construction and demolition waste were used as aggregates replacement (i.e. waste of cement/concrete debris, waste of ceramics and the waste of blocks) while the type of polymer resins (i.e. Epoxy) as cement replacements. The weight percentages of resin were changed within (20, 25 and 30) % to manufacture this polymer concrete. The tests we done like physical such as density and mechanical such as compressive strength, flexural strength. Splitting tensile strength and Schmidt hammer rebound hardness.
Keywords: Polymer concrete, Reusing Aggregates, Construction Waste, Eco-Friendly.

25. Design and Implantation of (NO2 and SO2) Air Pollution Sensor Based on Fiber Optic Technique

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Abstract: In this research, the design and implementation of an intrinsic fiber optic sensor working at room temperature to detect the presence of gaseous No_2 and So_2.
The design was based on the technique of intensity modulation and the eevanescent waves emitted from the sensor area. The fiber optic clad was removed and its coating with an alternative polymer material absorbs the evanescent waves that are emitted from the sensing area. The sensor has high reliability and fast response time at room temperature.
Keywords: fiber sensor, Chemical sensor, No_2 sensor.

26. A Comparison of Satellite Carbon Monoxide Measurements from MOPITT and AIRS over Iraq during the Winter and Spring of 2012

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Abstract: Atmospheric Carbone monoxide (CO) volume mixing ratios (VMR) retrieved by satellite instruments, the Measurement of Pollution in the Troposphere (MOPITT) and Atmospheric Infrared Sounder (AIRS), were used to analyze local emissions and compared over Iraq during the winter and spring of 2012. A comparison and cross reference are necessary to understand the impacts of these two data sets to the scientific conclusions developed from them, due to their simultaneous measurements of CO. The monthly CO VMR from MOPITT surface and AIRS 800 hpa are utilized for both; comparison using the same a priori profile and direct comparison between the two instruments over Iraq for the period from 1 January to 31 December 2012. The CO VMR examination of the fluctuated, related to the mean CO background measured by each instrument, shows large-scale serendipitous spatial properties develop along the year. The regional CO VMR differences between two instruments were 5-35 ppbv and it's large for higher CO plumes and smaller for clean pristine desert environment. Both instruments observed enhancements of CO over the mountains and agreed with low CO over the southern region. Also, the time series of the monthly CO anomalies reveal a seasonal cycle signal, with high in winter and low in summer, due to meteorological condition, geographic nature of the regions and characteristic of the lower and upper troposphere to which MOPITT and AIRS are respectively sensitive to. This comparison demonstrates that there is a general consistency when considering the different vertical sensitivities of the instruments. The satellites observation efficiently shows the spatial and temporal variations of CO for the considered study area.
Keywords*: Carbon monoxide, Satellite, Remote sensing, MOPITT, AIRS.*

27. Treating of Wastewater Contaminated with Dyes Using Photo-Fenton Processes

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Abstract: This study investigated Advanced oxidation process (AOP) utilizing photo-Fenton

system ($UV/H_2O_2/Fe^{+2}$) in treatment of wastewater contaminated with dyes. The experiments were carried out by batch systems. Acid Blue -9 dye (AB-9) was used as a model for dyes in wastewater. The experiments were conducted using Pyrex glass cylinder two liter volume reactor. The influence of different variables in batch experiments: H_2O_2 (10-800mg/L), Fe^{+2}(5-100mg/L), pH (2-5) and initial concentration of AC-9 (25-150 mg/L) and their relationship with the oxidation efficiency were studied. In batch photo-Fenton system, the experimental results showed that the reagents required for complete removal (AC-9) (50mg/l) were: H_2O_2=800mg/L, Fe^{+2} =50mg/L under acidic condition (pH=2), temperature =20^oC and irradiation time of 150 min. The result shows that the oxidation reagent H_2O_2 plays a very important role in dyes removal, and they final removal efficiency reached 99%.

Keywords: Dye removal, Advanced oxidation processes, H_2O_2.

28. Theoretical Study of Extensive Air Shower Effects in Atmosphere by Simulating the Lateral structure of Several Cosmic Radiations

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Abstract: Extensive air showers (EAS) are a cascade of electromagnetic radiation and ionized particles that produced in the atmosphere through the interaction of a primary cosmic ray with the atom's nucleus in the air producing a huge amount of secondary particles such as X-ray, electrons, neutrons, muons, alpha particles, etc. In this work, EAS effects were demonstrated by estimating the lateral distribution function (LDF) at ultrahigh energies of the various cosmic ray particles. The LDF of charged particles such as electron and positron pair production, gamma and muons particles was simulated at ultrahigh energies 10^{16}, 10^{18} and 10^{19} eV. The simulation was carried out using an air shower simulator called AIRES system version 2.6.0. The effect of the primary particles, energies and zenith angle (θ) on the LDF of charged particles produced in the EAS was taken into account. Comparison of LDF for charged particles and experimental results gave good agreement for electron and positron pair production and muons particles at 10^{19}eV for θ=0° and 10°.

Keywords: AIRES system; lateral structure; extensive air shower; muons.

29. Improvement Optical Properties of PVA/ TiO_2 and PVA/ ZnO Nanocomposites

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Abstract: The optical properties of polyvinyl alcohol (PVA) doped TiO_2 and ZnO nanoparticles respectively, were studied. PVA/TiO_2 and PVA/ZnO nanoparticles were prepared by the pulsed laser ablation technique (PLA). The optical properties of PVA/ TiO_2 and PVA/ ZnO nanocomposite solution have been investigated by transmittance data and reflectance spectra. The optical band gap (Eg) was determined and the optical absorption spectra showed that a direct transition. The refractive index (n), extinction coefficient (k) and dielectric constant of the samples were determined. The energy gap of PVA/ ZnO nanoparticles have been observed the decreases its value and increasing in the optical conductivity as compared to PVA/ TiO_2.

Keywords: PVA/TiO_2, polyvinyl alcohol, nanoparticles, Optical band.

30. Superhydrophobic Aerogel as Sorbents for Iraqi Crude Oil Leaked In Water

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Abstract: A super hydrophobic aerogel has been utilized as adsorbed the Crude oil leaked during transport in the waters of the Tigris and Euphrates rivers and determine the capacity absorbing of the aerogel powder for crude oil. This technique is very important to get rid of environmental pollution caused by the leakage of crude oil in water, which in turn cause the death of fish, this application is an important economic wealth in the country, preliminary tests on Tigris and Euphrates rivers mixed with the crude oil, by using the aerogel in powder form to clean the water from crude oil, the study depended on two parameters are surface area and contact angle. We found that the increasing on surface area lead to increasing on the capacity of adsorbing the crude oil from water, also this result with contact angle.

Keywords: Aerogel, superhydrophobic silica, crude oil, environmental pollution, oil absorbing.

31. Treatment of Produced Water Generated at Alommara Oil Field-Missan Oil Company-IRAQ for Reinjection Application

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Abstract: This study has taken the problem of produced water (PW) at Missan Oil Company (MOC) which results huge quantities of water annually in different fields subsadiry to the company and particularly in Almmara oil field. The workteam has studied that problem and how to treat the produced water generated from Alammara Degassing Station for reinjection application depending on former experince in treatment of produced water in Rumaila Oil Field – DS1 , Basraha Oil Company(BOC) . A pilot plant ($10m^3$/day) for PW treatment for reinjection application was manufactured in japan as fulfilment of joint research study between Iraqi side (PRDC, BOC) and Japanese side (JCCP, WRPC, and Swing) to treat the produced water generated in Rumaila Oil Field.The pilot plant was transfered and installed in Almmara Oil Field – Alammara Degassing Station. The pilot plant consists of many treatment stages. Removing of oil by using corrugated plate interceptor technique (CPI) is the first stage of treatment. In some circumstances, the presence of irons in the produced water needs a treatment to meet the reinjected specifications of water. A chemical oxidant (Sodium Hypochlorite) was used in the pilot plant to oxidize the iron. The total suspended solids (TSS) are decreased to the required value by using coagulation – Flocculation process and triple sand filter media. The other target parameters to be treated in the pilot plant are bacteria and dissolved oxygen. Chemical agents, Sodium Hypochlorite and Sodium Sulfite were used to treat bacteria and dissolved oxygen respectively. Caustic Soda solution was used to get a suitable PH value. The specifications of treated water by this piot plant were very proper for safely reinjection to increase the recovery of oil.

32. The impact of Oil well fires on the free space optical systems

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***Abstract*:** Aerosol particles in oil fire plumes caused crucial air pollution. The smoke plumes from the blazes initially launched 200-400 m into the air and then continued to rise. The presence of liquid and solid aerosols may cause severe disturbance to the propagation of optical and infrared waves, thus can produce harmful effects on the wireless communication systems. In this paper, we analyze the bit error rate (BER), single to noise ratio (SNR), Q-factor and outage performance of single-input single-output (SISO) and multiple-input multiple-output (MIMO) FSO systems under attenuation of dense smoke conditions. Obtained results demonstrated that the performance of (SISO) FSO link is degraded from the Fog, Smoke and acid-rain Attenuation due to their chemical nature, their size and their concentration. As well, (MIMO) FSO link is a highly efficient way can be minimal smoke pollution effects.

***Keywords*:** Air pollution, oil fire Aerosols, Free space optics, BER and Q- factor

33. Enhancement Underwater Image Using Histogram Equalization Based on Color Restoration

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Abstract: In this paper, The improvement of underwater images was re-correct color by design of a new method by using histogram equalization based on color restoration (HEBCR). Proposed method adopted on applying traditimal histogram equalization on the image in RGB model, and then performed color correction by using (XYZ, LMS) color spaces and add to that apply logarithm mapping. Quantitative analyses indicate that the proposed method outperforms other methods as (Multi Scale Retinex Algorithm With Color Restoration (MSRCR), Integrated Color Model (ICM), Unsupervised Color Correction Method (UCM), and Rayleigh-stretching and averaging image planes (RSAIP) by calculating no reference image quality assessments. Finally, we concluded From the results that the proposed HEBCR method is much better than the other Methods for Enhancement underwater images

***Keywords*:** Underwater image processing, Histogram Equalization, image color restoration

34. Decadal Analysis of Carbon Dioxide Emissions from Different state of Fossil Fuels in Iraq

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Abstract: Calculate correlation analysis of decadal CO_2 emission throughout three kind of fossil fuel solid, liquid, and gas. A product of fossil fuel combustion and biomass burning, it is also emitted from land use changes and other industrial processes. It is the principle anthropogenic greenhouse gas that affects the Earth radiative balance. Emission intensity is the average emission rate of a given pollutant from a given source relative to intensity of a specific activity. Burning of carbon based fuel since the industrial revelation has rapidly increased concentrations atmospheric carbon dioxide, as same of data source of this work.
The results shown the CO_2 emission from gaseous fuel consumption increased 10 times for first decadal 1045.10kt than last decadal, whereas since 2004 not less than 10000 kt. The CO_2

emission from liquid fuel consumption increased 10.4 times than last decadal that was 86759kt, while the same emission from solid fuel consumption decreased four times that last two decadal was near to zero kt. The percentage CO_2 emission of total fuel combustion for three sectors of life carried out: CO_2 emissions from electricity and heat production, different between first and last decadal was 10.584%, and for transport was 1.8%, while decreased from manufacturing industries and construction was 6.7%.

Keywords: Decadal, CO2, emission, fossil fuels, Iraq.

35. Estimation of Heavy Metal Concentration for Sediments of Shatt Al-Basrah Canal by using Ecological Indices

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Abstract: This study was conducted to describe the distribution of metals in sediment of Shutt Al-Basra canal south of Iraq, where involved the measuring of four substantial metals Cd, Cr, Fe and Mn in residue for five locations. For the estimation of heavy metals effect a three indices was utilize; Contamination Load Index (PLI) and Sediment Quality Criteria (QSm) and Metal Index (MI). The concentration of metal appear to be uniform distribution and have an identical pattern and it didn't exceed the acceptable level over the research time (2014-2015) except Iron were its concentration exceed the limit all the time in all stations. The result of the indices for the 5 stations was as following: PLI (1.3411, 1.24340, 1.1658, 1.1665, 1.4392), QSm (0.86355, 0.95191, 0.72032, 0.67163, 0.87784) and MI (2.45, 2.8, 1.88, 1.68, 2.51) respectively.

Third Section:

Nanomaterial applications to serve the human.

Invited Speaker Lecture

Lecture: Template Nanostructuring for Energy Conversion and Storage Devices

Dr. Yong Lei

Functional nanostructures have drawn intensive attention with the development of device miniaturization.

Realizing such nanostructures presents an important task for nanotechnology research and device applications. Template-based technique provides a perfect approach to address this challenge owing to the geometrical characteristics of templates. We have developed template-based nanostructuring techniques using anodic aluminum oxide (AAO) with scalable, parallel and fast processes.[1,2]

Employing these techniques, three-dimensional and surface nanostructures have been fabricated. The obtained nanostructures possess large-scale arrayed configuration, high structural density, perfect regularity and cost-effectiveness, and are highly desirable for constructing energy conversion and storage devices, including solar water splitting,[3-6] rechargeable sodium-ion and potassium-ion batteries,[7-12] and supercapacitors[13,14]. The device performances demonstrated that the obtained nanostructures benefit these applications through the precise control over the structural features enabled by the geometrical characteristics of the templates. These achievements indicate the high potential and importance of template-based nanostructuring techniques for both basic research and device applications. Especially, we proposed recently a multiple nanostructuring concept using a binary-pore AAO template,[15] indicating a new perspective of template-based nanostructuring for device functionalization.[16]

Prof. Dr. Yong Lei & Dr. Huaping Zhao
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Research Articles

36. Design and Development of NDIR CO_2 Sensor for Air Quality Monitoring

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Abstract: CO_2 gas sensor is very important in the field of environment for measuring the air quality as well as in medical and industrial applications. Its Principle of work is based on non- dispersive Infra-red (NDIR) measuring technique. NDIR CO_2 sensors utilize physical sensing principles based on the infrared spectrum absorption method to monitor CO_2 gas of concentrations range from (0 - 2000) ppm absorption at a particular wavelength. The wide concentration range of CO_2 gas can be measured indoor and outdoor. NDIR CO_2 sensors show long term stability, accuracy, and low power consumption rate during CO_2 measurement. Finally the focus of this paper was on the optical gas chamber, IR light source and the thermopile detector.

***Keywords**: NDIR, CO_2 gas sensor, thermopile detector.*

37. Anti-Quorum Sensing Nanonetwork

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Abstract: Nanotechnology is a promising research field, which deals with structures, devices and materials creation, by manipulating matter at an atomic and molecular scale. Nanonetwork is considered a new research branch, which derived from applying nanotechnology in the digital communication field.

The communication between nanoscale devices expands the possible applications. Many options for communications in nanoscale have been revealed and studied, several of which use natural mechanisms and processes as a model, by directly applying different elements from nature to serve their purposes. Molecular communication is a bio-inspired communication mechanism, where information is exchanged through transmitting, propagating and receiving molecules between two nanometer-scale devices.The characteristics and rules that govern molecular communication are motivated by the communication in biological systems.

In this paper a model of nanomachines is considered, one of these nanomachines has some special responsibilities to direct and control processes of the network. These nanomachines, communicate through a shared unguided medium by stipulating and controlling diffusion processes to form a nanonetwork. A protocol is proposed in which these nanomachines attempt to jam the communication among bacteria, through exploring the biological process of quorum sensing in bacteria. This process is a form of consensus among bacteria population. In order to activate bacteria to perform its task (whether it is a useful or harmful), bacteria need to reach consensus first. Thus, these nanomachines attempt to jam the communication among bacteria, through diffusing a molecule which has been tested in biological experiments to lock the bacteria receptors. The nanomachines follow Poisson distribution to diffuse their jamming molecule. Eventually, the proposed protocol is employing the network's nanomachines to

prevent bacteria from reaching consensus and eventually from performing harmful activities.
Keywords: Nanonetworks, Molecular Communication, Consensus, Poisson distribution, Quorum Sensing.

38. Nanomaterials as Adsorbents to Treatment Water and Wastewater: A Review

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Abstract: Nanotechnology is a promising technology that offers solutions to treatment pollution by changing the shape and size of materials at the nano scale. Many nanoadsorbents have been developed for drink and wastewater applications. This article displays principles of the adsorption process and reviews different types of nanomaterials which used as efficient adsorbent surfaces to treatment environmental pollution problems including carbon based nanomaterials, metal nanoparticles, metal oxide nanoparticles, nanofibers and polymer nanocomposites.
Keywards: Nanomaterials, Adsorption, Water treatment, Dyes, Heavy metal ions.

39. Effect of Anodization Duration in the TiO_2 Nanotubes Formation on Ti Foil and photoelectrochemical properties of TiO_2 Nanotubes

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Abstract: In this study, the effect of anodization period on the photoelectrochemical features and morphology of titanium dioxide nanotubes arrays (TiO_2 NTAs) has been examined. The samples were characterized by X-ray diffraction (XRD) and energy dispersive X-ray (EDX) to characterize their crystalline structure and compositional. Surface morphological and their dimensional variation was examined by field emission scanning electron microscopy (FESEM). The anodizing duration played a significant role in the formation of TiO_2 nanotubes arrays. Moreover, the photo electrochemical properties (PEC) were studied through photocurrent measurements. An optimum anodizing duration of 60min at 40V exhibited maximum photocurrent of 0.03mA/cm^{-2} under illumination of halogen light.
Keywords: Anodization duration; TiO_2 nanotube; Photoelectrochemical.

40. Mechanical and Thermal Stability of Epoxy – TEOS Hybrids Materials using Sol-gel Method

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Abstract: Sol-gel method is the simplest method and has to preparation of nano particles, nano fibers, and nano flaks. Preparation of epoxy thermosets hybrid enables their improvement in mechanical properties (three point bending, and hardness), thermal properties. The effect of water absorption on bending and hardness test for tetraethylorthosilicate (TEOS) and epoxy hybrid have been investigated. TEOS with (0%, 2%, 4%, 6% and 8%) volume percentage mixed with epoxy to prepared sheets of hybrid, these sheets cut as samples for ASTM water absorption, bending and hardness tests.
The results shows that, adding TEOS to epoxy will increase absorbance of water .bending test shows that there are increase in values of bending stress with increasing TEOS but after immersion in water all the values for bending stress will reduce. Hardness values at least for

the samples immersion in water from dry samples occurs the diffusion of molecules water in the polymer and hybrids leads to space molecular chains for each other and decrease the hardness values. Thermal stability of hybrids increase with increasing TEOS ratio, the glass and decomposition temperature were shift compare with epoxy pure.

Keywords: Sol-gel, Epoxy, TEOS, water absorption, three point bending, hardness test, DTA analysis.

41. The Influence of Diode Laser Irradiation on the Optical Properties of Titanium Dioxide Nano Fillers Doped Polyvinyl Alcohol Films

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Abstract: The effect of diode laser irradiation with wave length (650 nm) for different irradiant times (0.25, 0.5, 1.00, 3.00, 4.00) hours on optical properties of titanium dioxide (TiO2) with particle size (15.7 nm) doped polyvinyl alcohol (PVA) films were studied experimentally. The films are prepared using solution casting technique in order to investigate the effect of TiO2 additions on the optical properties of PVA host. The optical properties of samples are investigated by measuring optical absorption spectra in the wave length range from (200 nm) to (900 nm) at 300 k, using UV-VIS spectroscopy. The influence can be explained by the PVA matrix.

All optical constants affected by laser irradiation such as refraction index, extinction coefficient, complex dielectric constants and optical energy gap which decreased with increasing irradiation times.

Keywords: diode laser, nano fillers doped polymer, PVA polymer, optical properties, titanium dioxide (TiO2).

42. Influence of Copper Nanoparticles on Dielectric Properties of Polystyrene

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Abstract: In this work, samples of pure polystyrene and polystyrene (PS) doped with copper nanoparticles were prepared using casting method. The effect of addition of copper nanoparticles on dielectric properties of polystyrene has been studied. For this purpose, many samples have been prepared by adding Copper nanoparticles to the polystyrene with different weight percentages are (0%, 3%, 6%, and 9%) and different thickness. The experimental results showed that dielectric constant, dielectric loss are increasing with increase the concentration of the copper nanoparticles and decreasing with increase of the frequency of applied electrical field, A.C electrical conductivity are increasing with increase the copper nanoparticles and frequency of applied electrical field.

Keywords: polystyrene, Copper Nanoparticles.

43. Quantum Mechanical Investigations into Thermochemistry Properties and Electronic, Structural of Nanocrystals

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Abstract: This paper presents quantum mechanical investigations that are into electronic and thermochemistry properties of Gallium phosphide. It also investigates diamondoids and

nanocrystals using the density functional theory. This is done at the generalized gradient approximation of Perdew et al basis set. This has been used to create Gaussian 09 program auxiliary by Gaussian view. In order to full investigate the ionization potential, affinity, valance bond, conduction bond, zero point energy and thermochemistry properties.
The result GaP diamondoids. Electron affinity and conduction band, decreases as a function of the total number of Ga and P atoms in most of the investigated range. Ionization energies, zero point and valance bands increased with the number of Ga and P atoms but there are fluctuations in tetramantane and hexamantane In fact, since the present diamondoids are built from nearly cubic cages. Thermochemistry entails calculation of frequency which also includes thermochemical analysis of actual system comprising of thermal energy correction, heat capacity and entropy

***Keywords**:* Gallium Phosphide, Nanocrystals, Thermochemistry, Diamondoids, Quantum, tetramantane and hexamantane

44. *Weissellacibaria*: New Lactic Acid Bacteria Genus Kills Cervical Cancer Cells by Its Synergistic Effect with Biosynthesis Nanoparticles of *Fusariumoxysporum*

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Abstract: In the present study 4 species were isolated from some vegetables., Antibacterial activity of these isolates was done against pathogenic test bacteria by agar well diffusion assay., then, molecular identification included (DNA extraction, PCR, Sequencing, Nucleotide and protein analysis) was done just for the more efficiency isolate to use in anticervical cancer line by its synergistic effect with biosynthesis nanoparticles of *Fusariumoxysporum* ., The result indicated that the first isolate (isolated from Turnip) had the higher activity than others against test bacteria, the molecular identification appeared that this isolate retend to *Wiessellacibaria* , one of Lactic Acid Bacteria genus, we recorded this isolate in NCBI(National Central Bank isolates) with our names(YHA). The synergistic effect between *Wiessellacibaria* and NPS of *Fusraiumoxysporium* increased the activity by decline the proliferation of cervical cell line.
So, the aim of this study, we discuss new advances in alternative natural drug from the chemical drug because the test material can use a strong weapon against cervical cell line., This project produced as patented to measuring device and quality control/ Department of patents .

Keywords: *Wiessella cibaria* , NPS of *Fusraium oxysporium* , cervical cancer

45. Extracellular Biosynthesis of Silver Nanoparticles using *Sphingomonas Paucimobilis, Serratia* Sp. and *Pseudomonas Aeruginosa* and Their Antimicrobial Activities.

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Abstract: Synthesis of silver nanoparticles (AgNPs) by microorganism is emerging as an important branch of nanotechnology due to its ecofriendly, safe, and cost-effective nature.

Cell-free culture supernatants of three bacteria *Sphingomonas paucimobilis, Serratia* sp. and *Pseudomonas aeruginosa* have been used to synthesize silver nanoparticles (AgNPs). The AgNPs were characterized using atomic force microscopy. The sizes of the AgNPs 91.74µm, 93.39µ m and 93.55µ m respectively. The antimicrobial activity of the synthesized silver nanoparticles was tested using both gram positive as well as gram negative bacteria, *Staphylococcus aureus, Klebsiella pneumoniae,* and *Streptococcus pyogenes*, also tested using *Candida albicans* respectively. In this study, AgNPs have the highest antibacterial and antifungal effect against all microorganisms and the zone of inhibition increased with the increase of silver nanoparticles concentration.
Keywords: Silver nanoparticles, Extracellular Biosynthesis, *Sphingomonas paucimobilis, Pseudomonas aeruginosa*, Antimicrobial activities

46. Seed/Catalyst-Free Growth of 2D And 3D Zno Nanostructures on Glass Substrate by Thermal Evaporation Method: Effects of Carrier Gas Flow Rate

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Abstract: Here, we report the seed/catalyst-free growth of 2D and 3D ZnO nanostructures on a glass substrate by thermal evaporation of Zn powder in the presence of O_2 gas. These nanostructures were grown on (75 ± 5 nm) ZnO seed layers, which were deposited on glass substrates by radio frequency magnetron sputtering. Prior to synthesized ZnO nanostructures, the sputtered ZnO seeds were annealed using the continuous wave CO_2 laser at 450 ℃ in air for 15 min.The effects of carrier gas flow rate on the morphological, structural, and optical properties were systematically studied using field emission scanning electron microscopy, X-ray diffraction and UV-Vis spectroscopy.
Keywords: ZnO nanostructure; Seed layer; CW CO_2 laser; Thermal evaporation.

47. Antibacterial Effect and Physical Properties of TiO_2 Nanoparticles/PVA Films against Pathogenic Bacteria in Plastic and Glass Plates

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Abstract: In this paper, the effect of TiO_2 (45.7 nm)/PVA, TiO_2 (15.7 nm) /PVA mixture on growth of *Staphylococcus aureus* and *Escherichia coli* in plastic and glass plates was studied. The structural properties of PVA, TiO_2 and TiO_2/PVA films were investigated. As well as, the optical properties for samples: pure PVA and two mixtures (TiO_2/ PVA) were demonstrated. The best results included that the reduction of *S. aureus* growth for pure PVA film on plastic plate maintained to (75%) and TiO_2(15.7nm)/PVA film on glass plate reached to (81%), whereas the best reduction of *E. coli* growth for TiO_2(45.7nm)/PVA film on plastic plates became (69%) and PVA(Pure) film on glass plates reached to (74%). The role of TiO_2 nanoparticles was clearly obvious in development structural and optical properties of PVA polymer. There are some peaks from TiO_2 will appeared in XRD of PVA.
Keywords: TiO_2 Nanoparticle, PVA Polymer, Antibacterial Effect, Physical Properties, Pathogenic Bacteria.

48. Seed Layer Thickness Effect on the Structural and Optical Characterization of Tio2 Nanostructure Thin Film.

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Abstract: In this research Titanium dioxide (TiO_2) nanostructure thin films have been prepared by chemical bath deposition method on a deferent thickness of seed layer (1,2 and 3)layers which deposited by sol-gel spin coating technique. Structural and optical characteristics were investigated as a function of the seed layer thickness using x-ray diffraction and UV-Vis spectrophotometer. The results showed that the TiO_2 thin films have a polycrystalline structure in nature with anatase phase and tetragonal crystal structure. The preferential orientation was along (101) plane and the crystallite size were in the range between (12-15) nm. The dislocation density, the number of crystallite and the strain of the prepared films were also investigated. The optical properties results showed that the thin film transmittance decrease with increasing the thickness of the seed layers, where the transmittance highest value was in the visible region about 53% at wave length 531 nm. The increasing of number of seed layers that lead to increase the thickness of the seed layer and the thin film which leads to increase the films absorbance. The energy band gap of allowed direct transition was decreased with the increase of the number of seed layers (thickness) from 3.378 eV to 3.067 eV with increase the thickness from 105.7nm to 156.6nm for one layer and three layers respectively.

Keywords: Nanostructure TiO_2; Thin films; CBD, Sol-Gel spin coating,; band gap.

49. Enhanced Ultraviolet Photodetector Based on Mg-Doped ZnO Nanorods Films

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Abstract: Magnesium-doped zinc oxide (ZnO: Mg) nanorods and nanotubes films were prepared by hydrothermal method deposited on glass substrates. X-ray diffraction (XRD), scanning electron microscopy (SEM), energy-dispersive X-ray spectroscopy (EDX), photoluminescence (PL), and optical absorption spectroscopy (UV) were performed to characterize the prepared films. X-ray diffraction analysis showed a decrease in the lattice parameters of Mg doped ZnO NRs. The Photoluminescence of the undoped and Mg-doped ZnO NRs displayed a near band edge. At 10 V bias, the metal-semiconductor-metal (MSM) ultraviolet (UV) photodetector performance of the Mg-doped ZnO prepared for various Mg concentrations of 0.0, 0.02, and 0.06 was investigated under radiation of 40μW/cm^2 at the wavelengths of 365 and 385 nm UV light. The ZnO sample doped with 0.06 Mg realized UV photodetector, in wavelengths 365 and 385 nm, at a responsivity of 3.45674 and 1.11727 with a detectivity of 5.90384*10^7 and 2.65511*10^7 for a quantum efficiency of 11.7552 and 3.60209 at a sensitivity of 1400.46636 and 723.36457, respectively, it was exposure of Uv-Led for time 120s.

Keywords: pure ZnO nanorods Mg doping ZnO nanorods, MSM Photodetector, hydrothermal method, nanotubes.

50. Zinc Metal Ion Affected The Structural Stability Of Amyloid-Like Nanofibrils.

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Abstract: Synthetic peptides can self-assemble into well-defined structures with a cross-β arrangement called amyloid-like fibrils. Amyloids are associated with a list of disorders and neurodegenerative diseases, such as Alzheimer's and Parkinson`s disease. We previously showed that amyloid-like nanofibrils with a repeating motif "IHIH" were functional fibrils. They were able to bind a metal ion through imidazole moieties and mimic the native carbonic anhydrase enzyme by hydrolysing the CO_2 molecule. Thus, these synthetic amyloid fibrils were suggested to be good candidates to moderate and update the modern enzymatic molecules. This study aims to shed a light on the stability of these amyloid nanofibrils over a study time of 25 days, in the presence/absence of a metal ion. The work continued for approximately 7 months in the Biochemistry department, School of Life Sciences at the University of Sussex in the United Kingdom. A set of designed peptides with a repeating motif "IHIH" were explored, based on some structural studies. Short and long peptides with free ends as well as closed ends were investigated. Peptides allowed to self-assemble with and without a metal ion (zinc) and then examined using circular dichroism, fluorimetry and electron microscopy for structural biophysical analysis. Regardless of the metal ion contribution, peptides showed stable secondary structures with a β-sheet conformation for the incubation time of 25 days. Their morphologies did not appear to change over time. However, the presence of a zinc ion has an effect on the secondary structure of the mature fibrils. Results indicated that fibrils grown with the zinc ion have a significantly higher propensity to form β-sheets secondary structures during incubation time. The presence of a zinc ion also affected the dimensions of the amyloid-like fibrils by the end of the study course, when they significantly reduced. This effect of zinc ion on synthetic amyloid fibrils has not been previously reported. The stabilities of the zinc-free nanofibrils point to their potential for use in modifying or updating the enzyme-mimic analytical reactions. The effect of adding zinc on the fibrillation time seems to be crucial. Although it apparently improved the β-sheet assembly, it affected the width/length of the synthetic amyloids. This effect could be promising toward reducing the generation of amyloid fibrils and ultimately understanding the pathogenesis of Alzheimer disease.

Abbreviations: transmission electron microscopy (TEM), circular dichroism (CD), Thioflavine T (ThT), zero-time fibrillation (0t), peptides assembled with zinc (zinc-peptides), peptides assembled without zinc (zinc-free peptides).

Keywords: Functional fibrils, amyloids, structural stability, circular dichroism.

51. Effects of Silver nanoparticals on Biofilms of *Streptococcus* Spps

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Abstract: Today technology using nanoparticle when treatment pathogentic microorganism and we focused on this here. It was found that the species of streptococcus used in present study were sensitive to erythromycin. In present study focusing biofilm formation by *Streptococcus* spp was evaluated. Species *S. gonorrhoeae* was found that highest amount of

biofilm while lowest in the species of *S. mutans*. The aim of report effect (SNPs) on ability of biofilm form different species of streptococcus. The anti-biofilm effect of SNPs was in concentration dependent manner. The highest effect of SNP against biofilm formation was found the concentration 160 µg/ml, while the lowest effect was found the lowest used concentration (80µg/ml) of SNPs. The highest anti-biofilm effect of SNPs was found in biofilm formation of *S.viridans*, while the lowest in case of *S.gonorrhoeae*. In vivo study revealed that silver nanopasrticles treatment of *Streptococcus pyogenes* contaminated injured skin showed good prognosis and good healing process include complete regeneration of the epithelial cells of the epidermis and increase of cellulartiy of the dermal content compared with untreated group. In conclusion, treatment of skin infected with *S. pyogenes* using silver nanoparticles concentration (160µg/ml) may limited the skin damage, localized the lesion to the incision site and enhance the healing process.

Keywords: Biofilm, Silver nanoparticle, Streptococcus.

52. Synthesis of a Solar Cells by Organic – Inorganic Hybrid Perovskites

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Abstract: One of the important electronic applications in recent years is organic – inorganic hybrid perovskite materials because of their many useful characterizations particularly the low cost, tunable optical properties and high-efficiency. In this work we used varieties of lead halides, $PbCl_2$ and $PbBr_2$ to prepare two types of perovskites, $MAPbBr_3$and $MAPbBr_2Cl$ by one step method then study their properties; structural, morphological and optical properties, to fabricate solar cells from these perovskites with preparation of TiO_2 nanocrystal as electron transport material ETM by hydrothermal method. The power conversion efficiency PCE achieved is 0.46 % and fill factor FF=0.20 for $MAPbBr_3$ perovskite while the power conversion efficiency PCE for $MAPbBr_2Cl$ perovskite reached up to 0.3 % and fill factor FF= 0.34.

Keywords: *Perovskite,TiO_2, nanorystals, solar cells, ETM.HTM*

Fourth Section:

Computer Bioinformatics Applications

Invited Speaker Lecture

Lecture: Cyber Crime and Information Protection


Dr. Hamza A. Al-Sewadi

Introduction:

The world become increasingly reliant on the net, and it's being used right now to transfer everything from friendly emails to hypersensitive data, available all the time, anywhere, and ready and fast. Many terms are used and must be distinguished from each other, such as information privacy, Cyber security, Cyber space, etc.

Information privacy, or data privacy: is the relationship between the collection and dissemination of data technology, the public expectation of privacy, and the legal and political issues surrounding them. It is the right to control what information about a person is released. On the other hand, Cyber Security can be defined as Protection of information systems against unauthorized access to or modification of information, whether in storage, processing or transit, and against the denial of service to authorized users, including those measures necessary to detect, document, and counter such threats. Moreover, Cyberspace is a worldwide network of computers and equipment's that connect them, which by its very design is free and open to the public (the Internet).

What Does "Security" Mean?

"Security" is the quality or state of being secure, to be free from danger. That includes: Physical security, Personal security, Operations security, Communications security, Network security, and Information security.

How safe we are (The need to Information Security laws):

Information security, privacy and security challenges are growing around the world, due to the drastic grow of Cyber Crime, not the least is the world-wide ransom-ware assault of last year that crippled more than 200,000 victims in at least 150 countries. Besides, there are so many serious cyber security breaches. It is claimed by the European Data Protection Supervisor, Giovanni Buttarelli, in 2017, that 121 counties responded to the EU GDPR initiative, and will support the data protection regulation. Hence, so many regulations (and standards) worldwide are either in power or under way are set for data protection in order to provide more security and restore trust, such as GDPR: General Data Protection Regulation in EU countries, NCSS: National Cyber Security Strategy, in the U.K., Many versions of Data protection legislation in the United State that varies between different states, and so many more.

Information Security Threats:

- Act of Human Error or Failure; (accidents, mistakes)
- Compromises to Intellectual Property; (piracy, copyright infringement)
- Acts of Espionage or Trespass; (unauthorized access and/or data collection)
- Acts of Information Extortion; (blackmail of information disclosure)

- Acts of Sabotage or Vandalism; (destruction of systems or information)
- Software Attacks; (viruses, worms, macros, denial of service)
- Forces of Nature; (fire, flood, earthquake, lightning)
- Quality of Service Deviations from Service Providers; (power & WAN service issues)
- Technical Hardware Failures or Errors; (equipment failure)
- Technical Software Failures or Errors; (bugs, code problems, unknown loopholes)
- Technological Obsolescence; (antiquated or outdated technologies)

Security breach: It includes the following:
Fake Offering, Like-jacking, Fake Plug-in Scams, Fake Apps, and Manual Sharing

The Need for Security:

- To protect the organization's ability to function,
- To enable the safe operation of applications implemented on the organization's IT systems,
- To protect the data, the organization collects and uses.
- To safeguard the technology assets in use at the organization.

The U.K National Cyber Strategic Objectives:
Three strategic objectives are set out to achieve cyber security: Defend, Deter, and Develop.

Prof. Dr. Hamza Abbass Al-Sewadi
Amman, Jordan.

Lecture: Body Parts as Unique as Your Fingerprint

Dr. Jamila H. Saud

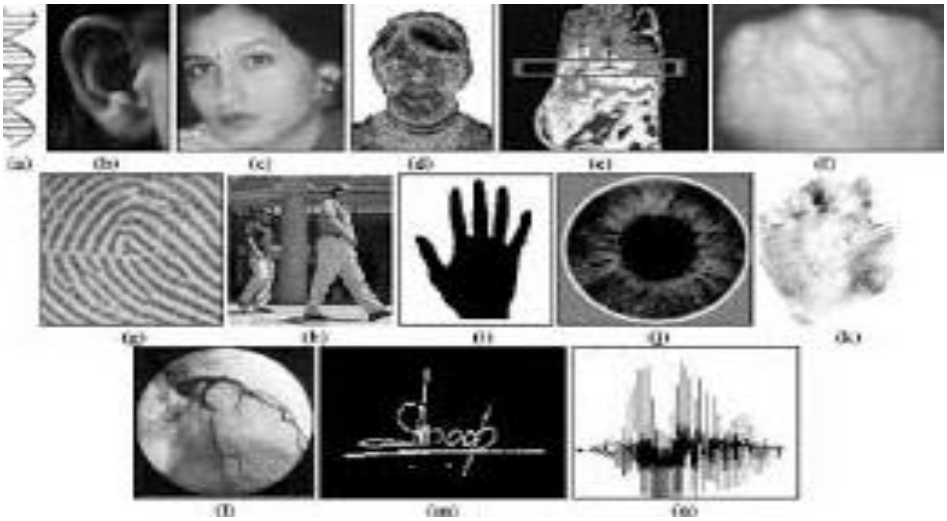
The Biometric judges the characteristics of a person taking into account his\her body type, face, hand, sleeping style, walking gait and such other aspects. Thus the physical appearance comes into greater focus on the grounds that they are constant factors not governed by the intentions of an individual. Biometrics extends the horizon (various precise landmarks) in identifying many health concerns. "Overall health is achieved through a combination of physical, mental and social wellbeing which together commonly referred to as health triangle".

Introduction:

Biometric techniques are being used increasingly as a hedge against identity theft. The premise is that a biometric is a measurable physical features or behavioral trait and is a more trustworthy indicator of identity than bequest systems such as passwords and PINs.
Physiological biometrics is based on data derived from direct dimension of a part of the human body. It involves fingerprint, iris-scan, DNA, retina scan, hand geometry, and facial recognition.

Behavioral biometrics is based on data derived from an action taken by a person or individuals behavioral characteristic.

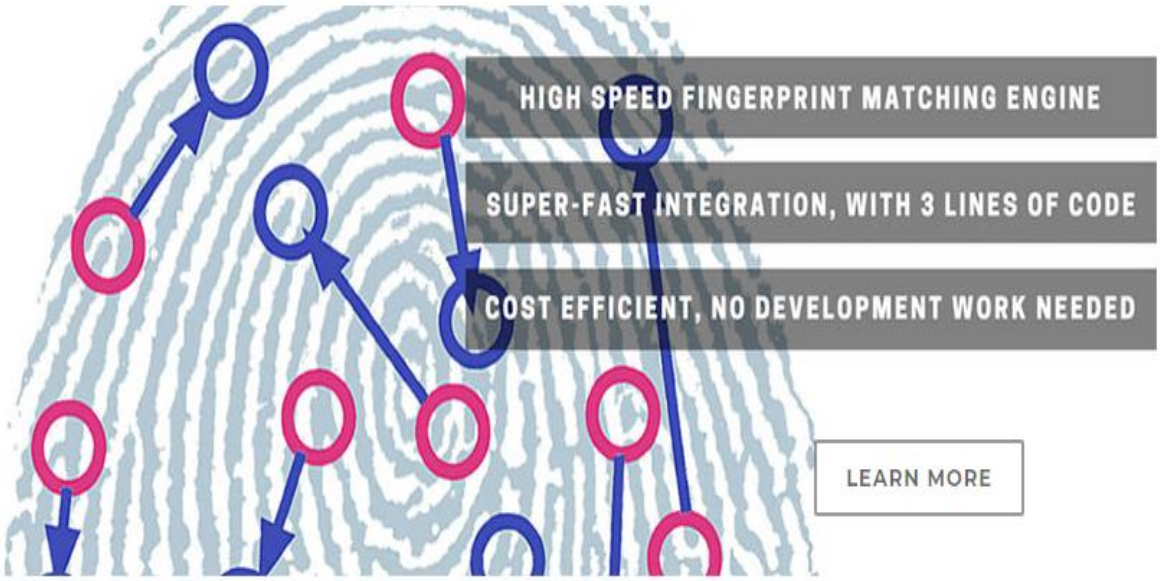
Fingerprint Types



1. Fingerprint

Fingerprint recognition has always been the most technologically benefitted method of identification among all other biometric recognition methods.

Fetching a fingerprint match is dependent on several factors; however, fingerprint image quality plays a pivotal role in successful matching. Other sub-systems of a biometric system depend on the quality of acquisition by the data capture sub-system. A poorly sampled fingerprint image not only hampers matching efficiency, but also results in poor performance by the overall system. Ensuring that sampled fingerprint image is of the highest possible quality is a crucial aspect, especially during the enrollment as subsequent matching operations post enrollment are compared against what is enrolled.



2. Iris

Eyes are the window to your soul *and* your identity. The iris, a muscle that opens and closes the pupil to control how much light enters the eye, has tiny textural patterns. DNA determines the color and structure of the iris, but its random pits, furrows, swirls, and rifts occur during fetal development, which makes every iris unique (even your two irises don't match each other). The patterns are thought to appear as the fetus opens and closes its developing eyes, and iris tissues tighten and fold.

Iris is much smaller than the ear, a high resolution camera device is required in order to acquire image of acceptable quality. In general, the capturing sensor device is usually placed far from the subject. Iris recognition also can fail when the subject wear glasses.

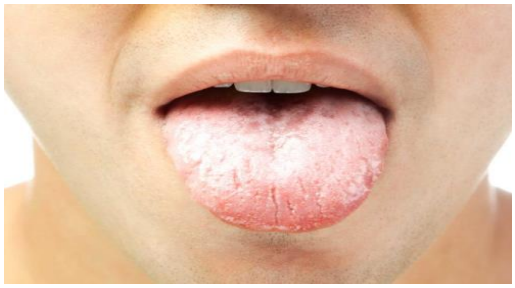
3. Ear

Trace the rim of your ear: Feel those curves and ridges? You're the only person in the world with that exact shape. In one British study, researchers developed an algorithm that could identify a single individual out of more than 250 others with a 99.6 percent accuracy rate by analyzing how light reflects off the curves of the ears. The ear is such a handy identifier that Yahoo is developing technology to unlock smartphones with an ear scanner. Someone receiving a call would unlock the phone by simply pressing it to the ear.

4. Lip Print

Hypothetically, detectives could seal evidence with a kiss. A study in the Journal of Forensic Dental Sciences found that the pattern of elevations and depressions in the lips are as unique as fingerprints. There's just one problem: Though lip prints have been used as identification in the court in isolated cases, criminals typically don't smooch crime scenes.

5. Tongue



Like a fingerprint, the tongue has its own shape and texture, and its tiny bumps and ridges are distributed in a way that is uniquely yours. These patterns rarely change over time since the tongue is protected inside the mouth (unlike fingertips, which may become scarred).

Researchers are developing 3-D tongue imaging to aid in identification.

6. Voice

So, it is not quite a body part, but your voice is unlike any one else's. Some vocal characteristics are easy to detect, such as frequency (high or low) and intensity (loud or soft). Other traits, however, such as tightness, resonance, or nasality are usually more difficult to pinpoint. An individual's unique vocal tract is partly genetic and partly learned. The length of one's neck and the width of the pharynx play a part, but so do learned characteristics such as lip rounding and vowel pronunciation. Based on these combined traits, scientists have already created systems to automatically recognize a person's voice if it is pre-recorded in a database.

The voice of a person changes over time due to age, health conditions and emotional state, etc. Voice is also not very unique and may not be appropriate for large scale identification. A disadvantage of voice-based recognition is that speech features are sensitive to a number of factors such as background noise.

7. Toe print

A toe print is unique. The whorls and ridges develop uniquely in each person and are not genetically determined. There are a few famous cases in which criminals have been caught by using toe prints. The first was at a Scottish bakery in 1952 when a safe-cracker was identified by the footprints he left in flour. Toe prints were even suggested as biometric data to be included in the now-abandoned UK identity card scheme.

8. Teeth

Your teeth not only reveal your DNA—which is why dental records are often used to identify bodies—but are particular to you based on your personal habits. Perhaps you clench your jaw, grind your teeth, play a certain instrument, or hold keys in your mouth on the way to the car. Because of this environmental wear and tear, even identical twins have different sets of teeth.

9. Retina

The very back of the eye, the retina, is a precise snapshot of your nervous system, unique to you. It displays a pattern of blood vessels that your eye doctor observes to

detect the **first signs of diabetes**, high blood pressure, and even declining brain health. Though human retinas are typically only observed at the optometrist, retina identification is widely used in the animal world to verify show cattle and purebred horses and to track disease outbreaks.

10. Gait

OK, it's not quite your feet—but how you use them. Do you slightly drag one foot? Bounce on another?

Gait is a behavioral biometric. Gait is not supposed to be very distinctive, but is sufficiently discriminatory to allow verification in some low-security applications. It may not remain invariant, especially over a long period of time, due to fluctuations in body weight, major injuries involving joints or brain.

Though more research is needed, gait identification could eventually be a way of identifying individuals from a distance—such as camera footage that identifies a robber walking out of a bank.

11. Keystroke

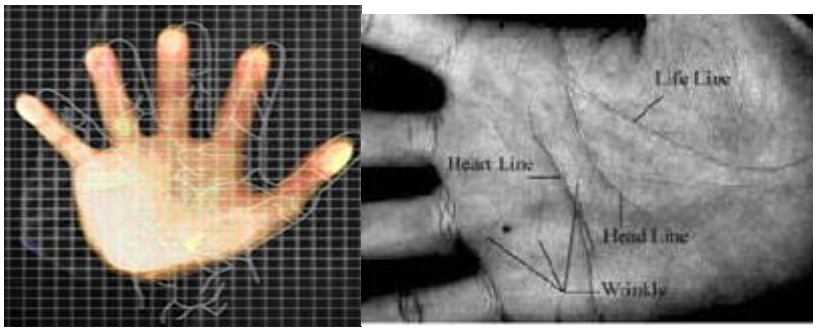
This behavioral biometric is not expected to be unique to each individual. The keystroke dynamics may vary depends on the health condition. It is expect to observe large variations in typical typing patterns. The keystrokes of a person using a system could be monitored quietly as that person is keying in information.

Keystroke dynamics refers to the process of measuring and assessing human's typing rhythm on digital devices. Such device, to name a few, usually refers to a computer keyboard, mobile phone, or touch screen panel. A form of digital footprint is created upon human interaction with these devices. These signatures are believed to be rich in cognitive qualities, which is fairly unique to each individual and holds huge potential as personal identifier.

12. Palm Print

Palm print recognition is a biometric authentication method based on the unique patterns of various characteristics in the palms of people's hands.

The palm prints scanners need to capture a large area; they are more expensive than the fingerprint sensors. The physical size of a palm print based system is large, and it cannot be embedded in certain devices.



13. Palm Vein

Palm vein recognition is a biometric authentication method based on the unique patterns of veins in the palms of people's hands. Palm vein recognition systems, like many other biometric technologies, capture an image of a target, acquire and process image data and compare it to a stored record for that individual.

14. Signature

The signature of a person is to be a characteristic of that individual. Signatures require contact with the writing instrument and an effort on the part of the user, which have been accepted in government, legal, and commercial transactions as a method of verification. It changes over a period of time and is influenced by physical and emotional conditions of the signatories. Signatures of some people vary significantly. Professional forgers may be able to reproduce signatures that fool the system.

Prof. Dr. Jamila H. Saud
Mustansiriyah University, Iraq.

Research Articles

53. Deep Learning Machine using Hierarchical Cluster Features

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Abstract: Deep learning of multi-layer computational models allowed processing to recognize data representation at multiple levels of abstraction. These techniques have greatly improved the latest ear classification technology. PNN is a type of radiative basis for classification problems and is based on the Bayes decision-making base, which reduces the expected error of classification. In this paper, strong features of images are used to give a good result, therefore, SIFT method using these features after adding improvements and developments. This method was one of the powerful algorithms in matching that needed to find energy pixels. This method gives stronger feature on features and gives a large number of a strong pixel, which is considered a center and neglected the remainder of it in our work.
Each pixel of which is constant for image translation, scaling, rotation, and embedded lighting changes in lighting or 3D projection. Therefore, the interpretation is developed by using a hierarchical cluster method; to assign a set of properties (find the approximation between pixels) were classified into one.

Keyword: Scale Invariant Feature Transform (SIFT), Region of Interest by using Masking Hierarchical Cluster method, Probabilistic Neural Networks (PNN).

54. Mammography Images Segmentation Based On Fuzzy Set and Thresholding

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Abstract: Breast cancer is the most widespread cancer that influences ladies about the world. Early recognition of breast tumor is a standout amongst the hugest variables influencing the probability of recuperation from the illness. Hence, mammography remains the most precise and best device for distinguishing breast malignancy.
This paper presents a method for segment the boundary of breast masses regions in mammograms via proposed algorithm based on fuzzy set techniques. Firstly, it was used data set (mini-MIAS) for evaluate algorithm. it was preprocessing the data set to remove noise and propose fuzzy set by using fuzzy inference system by generated two input parameters (employs image gradient), then used thresholding filter. Then it was evaluated this proposed method, qualitative and quantitative results were obtained demonstrate the efficiency of this method and confirm the possibility of its use in improving the diagnosis.

Keywords: Mammography, segmentation, fuzzy logic, mass detection, thresholding.

55. Cloud Platform Specification based on Bioinformatics application

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Abstract: Cloud computing technologies are evolving as good solutions to bioinformatics problems, There are today many applications within the field of Cloud-based services in bioinformatics such as: DaaS, SaaS, PaaS and IaaS referring to Data, Software, Platform and

Infrastructure as a Service respectively. These services were developed based on cloud platform by the big enterprises. This paper, will provide the specification and field of application of platforms such as: Google Genomics, Cloud Genomics, Genomics API, and Map Reduce with correlated software such as: hadoop and presents a number of existing software solutions in bioinformatics domain that use the Map Reduce programming mode to enable their application and incorporation as a graphical workflow engine. Such engine allows these results to be easily grouped together and eases the advance of open-ended analyses and encourages its. The researchers in Cloud genomics application like Cancer and Autism, then, present new recommendations for developing the performance of bioinformatics filed.

Keywords: Cloud Computing, bioinformatics, Google genomics, Genomics API, Cloud Services, CloudGene.

56. Constructing a Non-Rooted PhylogeneticTree for *Taenia* Genus

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[2] Department of Atmospheric Science, Collage of Science, Mustansiriyah University, Iraq.
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Abstract: The discovery of biological evolution is still an open challenge due to the increasing number of predicted DNA sequences every day. In bioinformatics, in order to discover the evolutionary distribution of a given set of organism genomes, we need to predict a well-supported phylogenetic tree of these sequences. In this paper, the main goal is to use distance-based algorithm to compute the similarity distances among given sequences, such-as Neighbor-Joining algorithm to predict the phylogenetic tree from a set of 17 mitochondrion genomes of *Taenia* genus. The results show the prediction of two non-rooted phylogenetic trees based on two features: the similarity score and SNP (Single Nucleotide Polymorphism) respectively. The predicted trees are then evaluated and the well-supported tree is returned.

Keywords: evolution; *taenia*; phylogenetic tree, SNP.

57. Robust Image Watermarking Based on LDL^T Factorization and Biometric Patterns

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Abstract: Personal information need to be safely transmitted over internet and address effectively. Robust watermarking of biometric patterns is a convenient technique used to increase security and data authentication, which is decisive due to the uniqueness of some types of watermark images. Biometrics like fingerprints, voice, retina, iris and blood vessel tree are being increasingly utilized for affirmative identification since they cannot be mislaid or forgotten and represent perceptible components. Furthermore, in the viewpoint of linear algebra, any digital image can be expressed by a matrix consists of a nonnegative number of scalars. Consequently, in this paper, we introduced a new blind watermarking algorithm using matrix decomposition method named LDL^T (another version of the classical Cholesky decomposition). We apply and analyze LDL^T to illustrate its impact on each 4×4 block of the LH band in the frequency domain that represent the output of LWT (Lifting Wavelet Transform). According to this analysis of the mathematical advantage of LDL^T, we are in the way to introduce a robust digital image watermarking algorithm in which binary biometric watermark bits are embedded into the element in the position (4,4) of each 4×4 block. Final

experimental results display that the new proposed mechanism is safe, imperceptible and has concrete robustness versus JPEG compression attack comparing to the former techniques. Finally, it is hoped that digital watermarking and biometrics technologies can facilitate the essential work functions, such as: Viewer Tracking, Copyright Control, Forensics, Copy Protection, Telemedicine and Content Identification.

Keywords: Cholesky Decomposition (LDL^T), Lifting Wavelet Transform (LWT), Biometrics, Fingerprint, Medical Images.

58. Data Encryption Using Zigzag and sequences of Bio Molecular Information

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Abstract: This paper proposed a new encryption algorithm for secure file communication. It consists of three stages of protection: DNA computation, generating keys, and encryption. The first stage, the file is converted to protein sequences. The second stage, an enormous number of arbitrary keys are created (range from 2^8 to 2^64) utilizing MRNA and crisscross exhibit lastly the encryption procedure is executed as the last stage. This procedure will improve the security of the encryption technique for data and correspondence frameworks and additionally including greater unpredictability. The proposed encryption and key generation methods solved the problem of exchanging secret data between the client and server. In this work a new Biomolecular table is utilized by providing values to the protein codons as a result of the existence of a variety of ribonucleic acid that generate same protein codons. The new technique doesn't take massive time within the conversion process; it directly matches the ribonucleic acid sequence with proposed protein table.

Keywords: *DNA Sequence, Zigzag, Encryption, Security, Bioinformatics and Key Generation.*

Fifth Section:

Mathematical and Bioapplications.

Invited Speaker Lecture

Lecture: Analysis of Neural Network from Topological View Point


Dr. Jalal H. Hussein

In this lecture, the subject of neural network analysis of the human brain was presented from a topological point of view. Where the interest in this subject began through a research center in Switzerland, this project aims to understand the transmission of information within the neural network of the human brain and has been using some of the pathological methods for this purpose.

Dr. Jalal Hatem Hussein
Baghdad University , College of Science for Women, Iraq

Research Articles

59. ### Fingerprints Authentication Using Grayscale Fractal Dimension

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Abstract: Characterizing of visual objects is an important role in pattern recognition that can be performed through shape analysis. Several approaches have been introduced to extract relevant information of a shape. The complexity of the shape is the most widely used approach for this purpose where fractal dimension and generalized fractal dimension are methodologies used to estimate the complexity of the shapes. The box counting dimension is one of the methods that used to estimate fractal dimension. It is estimated basically to describe the self-similarity in objects. A lot of objects have the self-similarity; fingerprint is one of those objects where the generalized box counting dimension is used for recognizing of the fingerprints to be utilized for authentication process. A new fractal dimension method is proposed in this paper. It is verified by the experiment on a set of natural texture images to show its efficiency and accuracy, and a satisfactory result is found. It also offers promising performance when it is applied for fingerprint recognition.

Keywords: Fractal Dimension, Box Counting, Fingerprint, Authentication.

60. ### Effect of Inclined Magnetic Field on Peristaltic Flow of Carreau Fluid through Porous Medium in an Inclined Tapered Asymmetric Channel

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Abstract: During this article, we have a tendency to show the peristaltic activity of magneto hydrodynamics flow of carreau fluid with heat transfer influence in an inclined tapered asymmetric channel through porous medium by exploitation the influence of non-slip

boundary conditions. The tapered asymmetric channel is often created because of the intrauterine fluid flow induced by myometrial contraction and it had been simulated by asymmetric peristaltic fluid flow in an exceedingly two dimensional infinite non uniform channel, this fluid is known as here by carreau fluid, conjointly we are able to say that one amongst carreau's applications is that the blood flow within the body of human. Industrial field, the silicon oil is an example of carreau fluid. By exploitation the perturbation technique for little values of weissenberg number, the nonlinear governing equations in two-dimensional Cartesian coordinate system are resolved under the assumptions of long wave length and low Reynolds number. The expressions of stream function, temperature distribution, coefficient of heat transfer, frictional forces at the walls of the channel, pressure gradient are calculated. Effectiveness of interested parameters on the inflow peculiar have been collude and studied.

Keywords: Peristaltic transport, Magnetic field, Heat transfer, non-Slip effects, Porous medium, inclined tapered asymmetric channel.

61. Generalized Power-Law Model of Magnetohydrodynamic Blood Flow with Heat Transfer

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Abstract: Unsteady non–Newtonian blood flow characterized by the generalized power-law model subjected to an external magnetic field together with heat transfer through stenosed artery has been developed. The arterial segment is assumed to be a cylindrical tube and the arterial wall is considered to be flexible having cosine shaped stenoses a condition due to the abnormal narrowing of a blood vessel. The full equations comprising the governing equations of motion, heat equation, the initial and the boundary conditions are solved using numerical procedure involves the discretization of the equations using the Marker and Cell (MAC) method, where pressure along the artery is calculated iteratively using the Successive-Over-Relaxation (SOR) technique. The results demonstrated through the simulations that under the influence of magnetic field, the blood temperature distribution over the entire arterial segment increases. The present results also predict the effects of the generalized power-law index and the Prandtl number on the distribution of blood temperature.

Conference Posters

1. ## Synthesis and Antibacterial Activity of Some New Derivatives Containing Thiazolemoietyand Study of Their Effects on MAO Enzyme Activity (Invitro)

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Abstract: The study includes synthesis and characterization of several heterocyclicsystems such as 1,2,3 triazoles(5), some pyrazole derivatives (8a-c) and (12a,b), thaizolo (10) and chalcone derivatives(11a,b) by reaction of 4-nitro aniline with appropriate reagents.all synthesized derivatives containing thaizolemoiety.These derivatives were characterized by IR,1HNMRand mass spectroscopy. Newly synthesized compounds were in vitro screened against several bacterial species as well as S.aureus, E.coli. effect of the prepared compounds were studied on monoaminooxidase (MAO) in healthy human serum. The results showed that all compounds because competitive inhibition with enzyme except (2, 7b, 10, 11a, 12b) causes uncompetitive inhibition and (6, 8a, 8c) caused mixed inhibition.

2. ## Comparative Study of the Academic Staff Awareness in CBRN between 2017 and 2018 in the Department of Chemistry, College of Science at Mustansiriyah University

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Abstract: The university professor is the mainstay of scientific and academic research, So it is necessary to combine efforts to raise awareness of the threats caused by the materials and equipment in the chemical, biological, radiological and nuclear fields that is assessed using a well-structured questionnaire. The questionnaire was distributed to academic workers who are directly involved in chemical laboratory daily activities at the College of Science to know awareness in CBRN in 2017, and the questionnaire is repeated in 2018 to compare the increasing in awareness in CBRN. The results showed that 15% of the researchers and workers know about CBRN in 2017 and the percentage is increased to 25% in 2018. The increase of the awareness rate is poor. So it is necessary to establish more seminars, workshops and webinars to increase awareness among laboratory workers and then to transfer awareness in CBRN to our students.

3. ## Indirect Effect of Smoking on Liver Function Tests: A Comparative Study among Iraqi Students in Baghdad City

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Abstract: Smoking is a process in which a substance like tobacco is burned to produce smoke that inhales and absorbed into the bloodstream. The cigarette smoking is one of the greatest causes of illness, such as lung cancer, and premature death. In fact, there is still a delay in the research that concerned with the full investigation of the malicious effects of smoking on liver tissue and functions. Thus, the present work was constructed to assess the link between cigarette smoking and the biochemical state of the liver. The study includes 50 smokers as patient group and 50 (with age and sex matched) non-smokers as control group. The liver functions tests (AST, ALT, total protein and ALP) were estimated spectrophotometrically. The results of the study revealed a significant decrease of aspartate aminotransferase (AST), alanine aminotransferase (ALT), serum total protein and alkaline phosphatase (ALP) in

smokers group when compared with control (non-smoker) group. Also the results revealed the presence of a positive correlation between ALT and AST. To conclude, alterations in liver parameters levels could be attached to the oxidative stress created through the accumulative effect of inhaled smoke as well as the interaction of absorbed toxic chemicals like nicotine. Therefore, the association between smoking attitude and liver functions tests should be carefully analyzed. Further works to understand the mechanisms of these associations are needed to clarify the harmful effects of smoking on the liver.

4. Study the Concentration of SO2 Which Emitted From Daura Refinery by Using Screen View Model

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Abstract: In this study, the concentrations of sulfur dioxide (SO2) were emitted from the Daura oil refinery units and their effect on the surrounding areas of the refinery were investigated, and also, study the air stability effective by using the screen view model, and check the effect of the wind speed and direction on the spread of pollutants. The spread of pollutants from the source of the emission (Daura refinery) were studied for the concentration of sulfur dioxide (SO2). As indicated during this study, the physical factors of the sources of pollution, such as the height of the chimney, its diameter and the surrounding environmental conditions, contributed to the increase in the concentration of contaminants. It was generally observed that the concentration of SO2 increased by increasing the rates of airflow and ambient temperature. This work was prove the influences of weather conditions in the transmission and spread of pollutants such as wind speed, wind direction, atmospheric stability and ambient temperature, but the effect of ambient air temperature was lower than others variables. When the distance increases and the source of pollution is removed, a thermal exchange takes place with the surrounding atmosphere. The difference between the temperature of the emitted gas and the surrounding atmosphere decreases and the buoyant force increases. This leads to a lack of vertical movement that disperses the contaminants. The concentration of the pollutants begins to decrease as the distance increases to keep away from the source of pollution.

5. Antibacterial and Anti virulence Factors of ZnO nanoparticles Biosynthesized by *Lacto coccus lactis* ssp. *lactis*

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Abstract: The present investigation reported the biosynthesis of ZnO nanoparticles using a probiotic bacteria*Lactococcus.lactis*ssp.*lactis*isolated from fish intestine. The characterization of nanoparticles were carried out by atomic force Microscopy (AFM)X-ray diffraction (XRD) technique, Fourier Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscopic (SEM) and Energy-dispersive X-ray analysis (EDX) spectra.Resultsof characterization showed that the nanoparticles are hexagonal ZnO crystal structure, spherically shaped with a diameter of about (31 - 36) nm. The biosynthesized ZnO nanoparticles were tested against pathogenic bacteria isolated from skin infections included *Pseudomonas aeruginosa*, *Acinetobacterbaumanii*, *Klebsiellapneumonia* , and *Staphylococcus aureus* . The antibacterial activity was evaluated through the determination of the minimum inhibitory concentration (MIC). TheZnO nanoparticles had antibacterial activity, the MIC ranged between (25 -

100)mg/ml. The anti-virulence factors also determinedagainst tested bacteria.
Results showed that the ZnOnanoparticleshad ability to inhibit virulence factorsthe ability ofβ-hemolysin,ureaseandpyocyanin production were decreased after treatment with biosynthesized ZnOnanoparticles,also the best effect has been shown in biofilm formation after 72 h for all isolates, with high inhibition 62.18% against *K.pneumoniae*(*K6*).

6. Biological activity of *new hydantoin derivatives* on *Acinetobacterbaumannii* Biofilm Formation Isolated from Clinical Sources

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Abstract: Completely 538 clinical specimens of blood, wounds, burns, sputum and urine were included in this study which was carried out in 4 hospitals. The isolation and diagnosis of fifty-two *Acinetobacterbaumannii* isolate 36.54% from blood specimens, whereas wounds specimens constituted 23.08%, burns specimens achieved 17.31%, sputum specimens formed 13.46% and a low percentage was in urine specimens which accomplished 9.62 %. Totally isolates of bacteria were identified via the biochemical, cultural and microbial characteristics and confirmed via VITEK 2 Compact system. It was found that all (100%) of bacteria isolates were resistant to amoxicillin-clavulanic acid and Cefepime, while Imipenem and Meropenem were the most effective antibiotics. The isolates showed the ability of biofilm production by Microtitration plates method (M.T.P), from the total number (52) isolate tested for biofilm formation,(33) were producers, as strong biofilm producers were (15) 45.46 % and (18)54.54% moderate while (19) 36.53% isolates were measured as none or weak producers of biofilm. MIC for new hydantoin derivative ($C_{12}H_{13}N_3O_2S$) was determined against fifteen isolates were active in MIC values equal to 31.25µg/ml gave (7) *A. baumannii* isolates, while in MIC, values equal to 62.5µg/ml gave (5) isolates, and three isolates were active in MIC values equal to 125µg/ml. The results showed the inhibitory effect of the hydantoin compound on biofilm formation for 15 bacterial isolates used in this study with variable inhibitory effect on bacterial isolates ranged from 98.85% to. 81.04%. The highest inhibitory effect percentage is (98.85%).
Keywords:-*Acinetobacterbaumannii, Hydantoin derivatives*, Biofilm, Antibiotics.

7. Image Processing of SEM Image Nano Silver Using K-Means MATLAB Technique

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Abstract: Nanotechnology is one of the non-exhaustive applications in which image processing is used. For optimal nanoparticle visualization and characterization, the high resolution Scanning Electron Microscope (SEM) and the Atomic Force Microscope (AFM) are used. Image segmentation is one of the critical steps in nanoscale processing. There are also different ways to reach retail, including statistical approximations.
In this study, we used the K-means method to determine the optimal threshold using statistical approximation. This technique is thoroughly studied for the SEM nanostructure Silver image. Note that, the image obtained by SEM is good enough to analyze.
More recently image analysis is being used in the field of nanotechnology. The K-means

algorithm classifies the data set given to k groups based on certain measurements of certain distances. K-means technology is the most widely used among all clustering algorithms. It is one of the common techniques used in statistical data analysis, image analysis, neural networks, classification analysis and biometric information. K-means is one of the fastest collection algorithms and can be easily used in image segmentation.
The results showed that K-means is highly sensitive to small data sets and performance can degrade at any time. When exposed to a huge data set such as 100.000, the performance increases significantly. The algorithm also works well when the number of clusters is small. This technology has helped to provide a good performance algorithm for the state of the image being tested.

8. Study the Relation between the Incidence of Giardiasis and Some Epidemiological Factors in Some Regions of Baghdad City

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Abstract: In this work, the incidence of giardiasis was investigated in some regions of Baghdad. Different factors were studied such as age, gender, personal hygiene and eating habits, in order to find its correlation with the prevalence of giardiasis. The study was carried out during the period of April 2014 till March 2015. During this period a total of 375 samples have been examined. The total rate of infection was68/375 (18.13%). The most frequent noticed clinical symptoms in giardiasis cases are abdominal pain 60.97%, diarrhea 41.46% and fever 35%. for the studied factors, each of the age, personal hygiene and eating habits showed a relation with the incidence of giardiasis.

9. The Effect of Rainfall on the Ratio of Atmospheric CO2 Drift for the 2015-2016 Season

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Abstract: Carbon dioxide is one of the most important greenhouse gases that cause man to rise in the atmosphere and increase these rates in the winter season while less in the season of plant start to grow as the plant withdraws this gas by photosynthesis, CO2 is closely related to several elements of air The most important is rain. The CO2 meter device was used at Al Mustansiriyah station for the purpose of measuring the concentration of gas during the winter season for the period 12/2015 and 3/2016 before rain fell by observing the weather situation, 14 rain cases were recorded during this period. The rainfall data measured by courier from the Automatic Station was also used in department of Atmospheric of college Sciences, Shows the increase in concentrations of Gas that has been measured than the natural gas. Where the ratio of co2 primary at the beginning of the rainy season up to 450ppm at the end of the winter was about 350ppm, External gas ratios by washing was high Whenever the rainstorm is strong. The intensity of the F is also increased by increasing the rain intensity I, so the rainy winter of Baghdad reduced the percentage of CO2 in the atmosphere

10. Strategies to Address Pollution and Environmental Challenges to Promote Environmental Sustainability

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Abstract: The study aims to conserve natural resources and reduce the drain for the future through energy conservation and environmentally friendly strategies to overcome all types of pollution (water, air, soil, climatic changes of) and other challenges affecting the health of individuals and Living in order to maintain a sustainable future, which includes the health of land, air and water for a healthier lifestyle to end suffering from poverty, hunger and disease and make the Earth able to support human life, by identifying such challenges and develop indicators of success of strategies adopted For processed and evaluated through indicators of success established as criteria.

The first chapter of four seasons studied systematic study and previous studies, the second episode adopted the definition in terms of study to understand it in order to accommodate the subject in order to reach solutions to reduce pollution and environmental challenges and work on creating policies And strategies for the preservation of the natural environment and overall shape between the third topic deals with the role of strategies to reduce environmental challenges Clarify strategic indicators fourth section contained the conclusions and recommendations of the study, and the main conclusions were that recycling in General is a strategy to confront the serious challenge of waste and industrial waste in order to produce new goods, helping to reduce the quantities of waste collected, usually in Landfills and cause environmental .

11. Tongue print Features Extraction By Gabor Filters Family

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Abstract: Nowadays, with the fast evolution of technology, information has been transmitted over public networks and internet which made the important information need to be secure. Many security applications or techniques are provides secure communication over public networks. One of these techniques is the tongue print. The important task in computer vision and object recognition is Efficient and effective image extraction ROI. The tongue body Extraction from digital images is important for automated tongue identifies. Before analyzing the tongue, feature extraction process is needed to extract the tongue from image, so it is possible to develop an application that can extract the tongue image from opened mouth image. This research presented survey on the tongue image segmentation technologies by Double Geo-vector flow (DGF). Also, this paper is proposed a method of tongue segmentation by extract RoI by using specific window with fixed size and then the resulted segment region (i.e., RoI) will be used to extract the features in step of extraction features. Gabor filters family is used to extract feature in our paper and the results will be obtained from this technique.

12. Influence of Helium-Neon laser on some virulence factors of *Staphylococcus aureus* and *Escherichia coli*

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Abstract: This work aims to investigate the effect of Helium-Neon laser on Staphylococcus aureus&Escherichia coli bacteria; their resistance pattern, virulence factors, and their plasmid

content.Bacteria were collected from patient suffering from urinary tract infections, septicemia, wound, and burn infections, then isolates were identified according to their characteristics, features; morphological, biochemical tests, and api systems. Out of Eighty-seven samples, twenty-seven isolates of S.aureus and thirteen isolates of E.coli were isolated. After laser treatment, the diameter of inhibition zone increased for almost of the used antibiotics beside some isolates became sensitive especially after 2 min of laser exposure time. The hemolysin production of irradiated bacteria was disappeared in two isolates of E.coli (40%) and one isolate S.aureus (20%) after ten min of irradiation, while it decreased to half in another S.aureus isolate. All S.aureus and E.coli isolates loosed their ability to produce β-lactamase enzymes by using Standard rapid iodometric and Standard Nitrocefin methods; some of these isolates loosed it after 5 minutes and the others after 10 minutes of irradiation. The results showed that laser irradiation hasn't any effect at any exposure time on adhesion factors of both S.aureus and E.coli isolates. Plasmid profile of E.coli Irradiated isolate illustrated disappearing of DNA plasmid bands as well as RNA after ten min of irradiation.

13. Detection of Some Virulence Factors of *Aeromonas Hydrophila* Bacteria That Contaminated Tigrisriver

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Abstract: In this study, we were obtained (45) isolates of *Aeromonashydrophila* bacteria isolated from (100) sample of Tigres river water and from different sites, from Baghdad to its point contact with Diyala river.

Isolates were identified by Vitek 2 system by biochemical tests in addition to bacteriology diagnosis by observing morphological and microscopic features of colones and results were showed the ability of all isolates(100%) to produceprotease , while 40 isolates (88.8%) ,34 isolates (75.5%) and 31 isolates (68.8%) produced β-hemolysin, Phospholipase and DNase respectively in addition to its Biofilm production at 100% .

INDEXING

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