

ABOUT VISTAS

VISTAS stands tall as one of the premier educational institutions in India, founded by the visionary and eminent educationist, Dr. Ishari K. Ganesh. Established in fond memory of his father, Shri. Isari Velan, a former Minister in the popular government of Dr. MGR, Vels Group of Institutions has been a beacon of quality education since its inception in 1992. Recognized for its excellence, VISTAS was granted Deemed to be University status by the Ministry of HRD, Government of India, in 2008, under Section 3 of the UGC Act 1956, and has since expanded to run 30 educational institutions. Over the last 30 years, VISTAS has offered a diverse range of courses across undergraduate, postgraduate, and doctoral programs in various disciplines including Medicine, Engineering, Management, Pharmaceutical Sciences, Maritime Studies, Science and Humanities, Agriculture, and Horticulture. Accredited with an "A ++" grade by NAAC in its new regulation scheme and designated as a mentor institution, VISTAS is committed to providing a holistic education that prepares students for global challenges. The university boasts a cosmopolitan culture, where students from diverse social, cultural, and geographical backgrounds come together to live and learn. Here, students are groomed to meet the demands of global industries, with a focus on practical skills and real-world applications. The environmentally friendly green campus provides state-of-the-art facilities, catering to the needs of both students and faculty. All programs are approved by AICTE and other appropriate statutory bodies, ensuring quality and relevance.

ABOUT AVISHKAR 4.0

Avishkar 4.0 is an intra-institutional technical project expo designed to showcase the creativity and innovation of Engineering, Life Science, Basic Sciences, Computing Sciences and Pharmacy students at VISTAS. It serves as a platform for students to exhibit their inventions and innovations, with a focus on recognizing the best projects in various areas of interest. This event aims to encourage students to develop leadership skills and engage with a wider audience, providing them with opportunities for career progression and technological development. By fostering a culture of innovation, Avishkar 4.0 inspires students to think beyond conventional boundaries and develop innovative solutions that benefit society at large. Overall, Avishkar 4.0 plays a pivotal role in promoting technological advancement and career growth for students at VISTAS, while also contributing to the broader goal of societal development through innovation and creativity.

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PROCEEDINGS OF THE AVISHKAR 4.0

INNOVATE – EXCEL – WIN

APRIL 07, 2025



Organized
by
School of Engineering
School of Life Sciences
School of Basic Sciences
School of Pharmaceutical Sciences
School of Computing Sciences



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*Proceedings of the
Intra-University Technical Project Expo*

AVISHKAR 4.0

Innovate – Excel – Win

7th April 2025

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PREAMBLE

AVISHKAR 4.0 serves as an Intra-University Technical Project Expo, aiming to inspire students to exhibit their inventions by recognizing the best projects within designated categories. This Expo fosters the development of leadership skills among students and facilitates their engagement with a broader audience. Acting as a conduit for technological advancement and career growth, this platform primarily encourages students to elevate their thinking by creating innovative solutions for societal needs.

Participants are encouraged to propose their ideas and transform them into practical applications. AVISHKAR 4.0 nurtures a culture of free thought and innovation, sparking creativity and empowering students to develop novel products across various fields such as Engineering, Science, Agriculture, and Medicine. AVISHKAR 4.0 offers participants the opportunity to refine their skills and ideas through unique approaches, fostering collaboration with peers and experts. Interaction with specialists and high-level representatives enables participants to share opinions and enhance their practical knowledge.

This multi-disciplinary project Expo welcomes students from diverse academic backgrounds, including the School of Engineering, School of Basic Sciences, School of Life Sciences, School of Computing Sciences, and School of Pharmaceutical Sciences. Innovation spans across a wide spectrum, encompassing topics such as sustainability, agriculture, sensors, automation, healthcare, app development, artificial intelligence, robotics, mechatronics, graphic design, e-waste management, web development, IoT solutions, water conservation, alternative energy, medical devices, energy storage, pharmaceutical innovations, formulations, and drug discovery. Participants have the freedom to select any of these topics to showcase their innovations and creativity.



Message from the Chancellor's Desk



Dr. Ishari K Ganesh

Founder & Chancellor, VISTAS
Chairman, Vels Group of Institutions

I am delighted to know that **AVISHKAR 4.0 - Innovate, Excel, Win** is being organized as an intra-university platform to encourage innovation, creativity, and excellence among students. In today's rapidly evolving world, technological advancements and innovative solutions are pivotal in addressing challenges across various sectors, including engineering, sciences, healthcare, and sustainability. The scope of this expo extends beyond just showcasing projects; it fosters a spirit of research, critical thinking, and problem-solving among young minds. Bringing together talented students from different disciplines, **AVISHKAR 4.0** serves as a bridge between academic learning and real-world applications, encouraging students to push the boundaries of innovation.

I appreciate the efforts of the organizers for focusing on key areas of technology, engineering solutions, sustainable development, and cutting-edge research. This platform will facilitate knowledge exchange, networking, and collaboration among students, faculty, and industry experts, creating an ecosystem where ideas can flourish and future leaders can emerge. I understand that a large number of participants from various departments are showcasing their projects, and the organizers have taken great care in curating an event that promotes quality and excellence. I am confident that the participants will benefit immensely from this experience, gaining insights into industry trends and technological advancements.

The oral presentations and project demonstrations will serve as a foundation for groundbreaking ideas, inspiring young minds to think beyond conventional boundaries. I strongly believe that events like **AVISHKAR 4.0** nurture innovation and contribute to building a skilled and knowledge-driven nation. I extend my best wishes to the organizers and participants for a successful and enriching event. May this expo ignite new ideas, foster collaboration, and pave the way for a brighter, technology-driven future.



Message from the Pro - Chancellor's Desk



Dr. A. Jothi Murugan,
Pro Chancellor (Planning & Development)

AVISHKAR 4.0 - Innovate, Excel, Win is an exciting initiative organized by VISTAS to encourage young innovators to showcase their creativity, research, and technical expertise. This event serves as a dynamic platform for students to present their ideas, interact with experts, and gain insights into emerging trends in science, engineering, and technology.

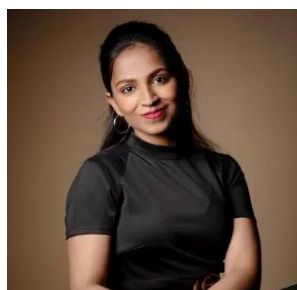
The expo aims to bring together students, faculty, and industry professionals to explore groundbreaking innovations and advancements. It fosters a collaborative environment where knowledge sharing, problem-solving, and interdisciplinary learning take center stage. With project presentations, interactive discussions, and hands-on demonstrations, AVISHKAR 4.0 is designed to inspire students to think critically and develop real-world solutions.

I am confident that the enthusiastic participation and exchange of ideas at this event will contribute to new innovations and technical advancements. The discussions and deliberations during this expo will not only enhance the students' scientific understanding but also encourage them to take their projects to greater heights in research and development.

I extend my best wishes to the organizers, participants, and faculty members for the grand success of Avishkar 4.0. May this event ignite curiosity, inspire innovation, and pave the way for future breakthroughs.



Message from the Vice President Desk



Dr. Preethaa Ganesh
Vice President
Vels Group of Institutions

With great pleasure, I extend a warm welcome to all attendees of the Intra Institutional Technical Project Expo AVISHKAR 4.0, on April 7th, 2025. Hosting such an event underscores our commitment to fostering a platform for young minds to unleash their creativity, explore new frontiers, and present solutions to real-world challenges.

VISTAS has consistently upheld a standard of excellence, and is dedicated to providing students with a platform to learn, grow, and expand their knowledge horizons across diverse fields of study. The realms of Basic Sciences, Life Sciences, Pharmacy, Computing Sciences and Engineering are inherently interdisciplinary, offering extensive applications across the spectrum of Science and Technology. The emergence of cutting-edge technologies such as Sensors, Healthcare, App Development, Robotics, E-Waste Design, Web Development, IoT Solutions, Water Conservation, Alternative Energy, Medical Devices, Energy Storage, Pharmaceutical Innovations, Pharmaceutical Formulations, and Drug Discovery is significantly impacting the way society functions today.

I would like to extend my gratitude to the School of Engineering, School of Basic Sciences, School of Life Sciences, School of Computing Sciences and School of Pharmacy for their contribution to **AVISHKAR 4.0**. Special thanks to all sponsors for their invaluable contributions to the event and the organisers for the smooth execution of this event. My best wishes to all the delegates; I assure that this event will certainly prove to be a rewarding experience.



Message from the Vice Chancellor Desk



Dr. S. Sriman Narayanan
Vice-Chancellor, VISTAS

I am pleased to note that **VISTAS** is organizing **AVISHKAR 4.0 Innovate, Excel, Win**, an **intra-university student project expo** that serves as a vibrant platform for innovation and creativity. Events like these are essential in fostering a research-driven mindset among students, encouraging them to develop solutions that address real-world challenges.

I strongly believe that **AVISHKAR 4.0** will play a crucial role in enhancing the quality of student research and promoting interdisciplinary collaboration. Innovation is the driving force of progress, and through this expo, students have the opportunity to transform their ideas into impactful projects. By bridging the gap between theoretical knowledge and practical application, this event will inspire students to think critically, experiment fearlessly, and push the boundaries of technology and engineering.

This platform allows participants to showcase their groundbreaking projects, share their experiences, and engage in discussions on the challenges and advancements in their respective fields. **AVISHKAR 4.0** is not just a competition, it is a celebration of talent, perseverance, and the pursuit of excellence. The event will provide students with the opportunity to network with peers, faculty, and industry experts, paving the way for future research collaborations and career growth.

I am confident that the dedicated efforts of the organizing committee will result in an enriching and insightful event. The high-quality projects and innovative presentations at this expo will inspire students to continue their journey in research and development, shaping the future of science and technology. I extend my heartfelt congratulations to the entire organizing team and wish **AVISHKAR 4.0** great success in fostering innovation, collaboration, and academic excellence.



Message from the Pro Vice-Chancellor Desk



Dr. M. Bhaskaran

Pro Vice-Chancellor, VISTAS

I am delighted to know that VISTAS is organizing **AVISHKAR 4.0 Innovate, Excel, Win**, an intra-university student project expo that serves as a dynamic platform for showcasing creativity, innovation, and research excellence. Events like these play a crucial role in inspiring young minds to develop groundbreaking ideas and apply their knowledge to real-world challenges. In today's rapidly evolving technological landscape, innovation is driving progress across diverse sectors such as engineering, healthcare, information technology, and sustainable development. The demand for cutting-edge solutions continues to grow, creating immense opportunities for research and development. AVISHKAR 4.0 provides students with an invaluable opportunity to present their projects, exchange ideas, and collaborate on pioneering research that can shape the future.

I appreciate the efforts of the organizing committee for selecting a timely and impactful theme for this expo. It is encouraging to see a diverse range of student-led projects being presented, reflecting their enthusiasm and commitment to pushing the boundaries of knowledge. With experts from academia and industry providing valuable insights, this event will serve as a catalyst for further exploration, fostering an ecosystem of learning and innovation. I am confident that AVISHKAR 4.0 will offer a stimulating and enriching experience for all participants, helping them enhance their skills, expand their horizons, and build meaningful collaborations.

I extend my heartiest congratulations to the organizers and participants and wish AVISHKAR 4.0 great success in igniting curiosity, nurturing talent, and driving academic and technological excellence.

CONTENTS

LIST OF ABSTRACTS

S. No.	Title	Page No.
1	DEVELOPMENT OF A REAL TIME RASPBERRY PI-BASED SCANNING SYSTEM FOR HAND HYGIENE MONITORING IN THE FOOD INDUSTRY	1
2	FORMULATION OF GUMMY CANDIES CONTAINING NANOCELLULOSE FOR DIABETES	2
3	DEVELOPMENT OF NANO ENCAPSULATION FORMULATION OF EFFECTIVE MICROORGANISM AS BIOFERTILIZER	3
4	DESIGN AND OPTIMIZATION OF PORTABLE ZEOLITE-BASED OXYGEN CONCENTRATORS FOR REMOTE AREA	4
5	DESIGN OF WRIST WATCH FOR ALZHEIMER DISEASE DETECTION	5
6	ECOGREY: A SMART KIT FOR GREY WATER MONITORING AND SAFE REUSE	6
7	DESIGN AND FABRICATION OF AUTOMATIC WASTE SEGREGATION MACHINE USING CONVEYOR BELT SYSTEM	7
8	SKIN DISEASE DETECTION USING MOBILENET DEPLOYED ON RASPBERRY PI WITH TELEGRAM BOT INTEGRATION	8
9	ETHICAL AND EFFICIENT MANAGEMENT OF BIOMEDICAL WASTE USING WIRELESS ROBOTIC SYSTEM A SOLUTION TO ENSURE HEALTH, SECURITY, SAFETY, AND ENVIRONMENTAL RESPONSIBILITY IN HOSPITAL WASTE	9
10	DETECTION OF GLAUCOMA BY MEASURING THE EYE PRESSURE WITH THE HELP OF SOFTWARE (MACHINE LEARNING)	10
11	IOT BASED SMART INHALER	11
12	AUTONOMOUS OBSTACLE DETECTION AND AVOIDANCE SYSTEM FOR ARDUINO-BASED MOBILE ROBOTS	12
13	STUDY ABOUT EMOTIONS USING VARIOUS PARAMETERS	13
14	SELF-STABILIZED GYRO TOOTHBRUSH FOR PARKINSON'S DISEASE: ENHANCING ORAL HYGIENE THROUGH REAL-TIME MOTION COMPENSATION	14
15	SDF SLAM: CNN-DRIVEN REAL-TIME MAPPING OF UNKNOWN ENVIRONMENT AND PATH PLANNING	15
16	PARKTROVE: REVOLUTIONIZING URBAN PARKING WITH SMART TECHNOLOGY	16
17	CERTILEDGER (Certificate verification and validation using Blockchain technology)	17
18	BIOMOTION LOCK: GAIT RECOGNITION FOR SECURE NFC PAYMENTS	18

19	POWERED TELEGRAM OSINT TOOL FOR CYBER THREAT DETECTION AND ANALYSIS	19
20	VULNSCANPRO FOR CYBER THREAT DETECTION & ANALYSIS	20
21	SMART PLANT AI DRIVEN IOT BASED MONITORING SYSTEM	21
22	CAMPV: THE ULTIMATE HUB FOR STUDENT ENGAGEMENT THROUGH A CAMPUS-CENTRIC SOCIAL PLATFORM	22
23	AI DRIVEN RECONNAISSANCE	23
24	SMART BLIND OBSTACLE DETECTION AND NAVIGATION SYSTEM	24
25	BIOLIFT EYE & WRINKLE GEL: THE ULTIMATE ORGANIC SOLUTION FOR YOUTHFUL SKIN	25
26	NATURE'S HEALING TOUCH: CABBAGE SEED OIL FOR JOINT RELIEF	26
27	NEXT-GEN ANTI-UV GLARE SUNSCREEN FOR SENSITIVE SKIN	27
28	FORMULATION AND EVALUATION OF VEGAN HAIR TINT: AN ECO- FRIENDLY PROCESS	28
29	FORMULATION AND EVALUATION OF A NOVEL POLYHERBAL PEEL-OFF FACE MASK	29
30	HYPO SHIELD: HIGHLIGHTS THE SOAP'S HYPOALLERGENIC PROPERTIES	30
31	TIMELESS RICE ELIXIR: AGELESS BEAUTY IN A BOTTLE	31
32	FORMULATION AND EVALUATION OF HERBAL COSMETIC CREAM FOR EFFECTIVE SKIN NOURISHMENT	32
33	DEVELOPMENT AND EVALUATION OF HERBAL FRUIT PEEL NAIL LACQUER AS A NATURAL REMEDY FOR NAIL FUNGAL INFECTIONS	33
34	AROKIYA UNAVU - DISEASE-BASED FOOD RECOMMENDATION APP	34
35	DEVELOPMENT AND FORMULATION OF A NOVEL WOUND HEALING CREAM INCORPORATING PEEPAL LEAF EXTRACT	35
36	PREPARATION AND EVALUATION OF TRANSDERMAL PATCHES USING CARROT SEED OIL FOR CRACKED HEELS.	36
37	FORMULATION AND EVALUATION OF ORGANIC HAIR SERUM FOR THE TREATMENT OF VARIOUS HAIR COMPLICATIONS	37
38	FORMULATION AND EVALUATION OF D-TOX BIO FOOT STRIPS	38
39	HERBAL LIQUID MOSQUITO REPELLENT FORMULATION USING <i>VITEX TRIFOLIA</i> AND ESSENTIAL OILS: A NATURAL APPROACH TO VECTOR CONTROL	39
40	WOUND HEALING EFFECT OF AN HERBAL SPRAY BANDAGE	40

41	ULTRACLEAR ACNE GEL: PRECISION TREATMENT FOR CLEARER, HEALTHIER SKIN	41
42	BHR ORGANIC LIP BALM	42
43	AGIRGENIX: A BIOINFORMATICS -POWERED MOBILE APPLICATION FOR CROP IMPROVEMENT	43
44	COMPUTATIONAL ANALYSIS AND MOLECULAR DOCKING OF BIOACTIVE COMPOUNDS FROM STROBILANTHES GLUTINOSUS AGAINST BREAST CANCER TARGETS	44
45	AUTOMATING PROTEIN DATA RETRIEVAL USING SELENIUM WEBDRIVER	45
46	UNRAVELLING THE ANTIOXIDANT ACTIVITY OF KOJIC ACID SYNTHESIZED BY <i>ASPERGILLUS FLAVUS</i>	46
47	EVALUATION OF PHYTOCHEMICAL, ANTI - BACTERIAL, ANTI-INFLAMMATORY PROPERTIES OF <i>ACALYPHA INDICA</i> LINN LEAF EXTRACT AND DEVELOPMENT OF PRODUCT	47
48	LOTUS STEM PRODUCTS	48
49	ECO-FRIENDLY FARMING: AQUAPONICS AN BIOFERTILIZER FOR A GREENER FUTURE	49
50	BIOELECTRIC CANCER DETECTION USING MFCS	50
51	<i>MANILKARA ZAPOTA</i> (SAPOTA) MILK SAP BASED CHEWING GUM FOR GINGIVITIS	51
52	ECO-FRIENDLY SYNTHESIS OF NiO/ZnO NANOCOMPOSITES USING <i>VITEX NEGUNDO</i> LEAF EXTRACT FOR MULTIFUNCTIONAL APPLICATIONS	52
53	EDIBLE MATERIAL FOR THE REPLACEMENT OF PLASTICS AND IT'S APPLICATION	53
54	AN AIE BASED FLUORESCENT PROBE FOR DIGITAL LIFTING OF LATENT FINGERPRINT MARKS DOWN TO MINUTIAE LEVEL	54
55	A MATHEMATICAL APPROACH ON FRACTAL VON-KOCH CURVE IN HILL CIPHER TECHNIQUES	55
56	FABRICATION AND CHARACTERIZATION OF NONLINEAR OPTICAL SINGLE CRYSTALS FOR DEVICE APPLICATIONS VIA LOW-TEMPERATURE METHOD	56
57	SOLAR POWER BASED PORTABLE WATER PURIFICATION	57
58	PREDICTION OF PROFIT AND LOSS IN THE STOCK MARKET USING GRAPH THEORY IN ORACLE	58
59	AN APPLICATION OF BODY MASS INDEX USING IN FUZZY LOGIC	59
60	GREEN SYNTHESIS, CHARACTERISATION OF NiO NANO PARTICLES OF LUFFA ACUTANGULA FOR BIOLOGICAL APPLICATIONS	60

DEVELOPMENT OF A REAL TIME RASPBERRY PI-BASED SCANNING SYSTEM FOR HAND HYGIENE MONITORING IN THE FOOD INDUSTRY

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ABSTRACT

Maintaining hand hygiene in food production requires detecting physical risks like cuts, wounds, and infections that traditional methods often miss. We developed a real-time deep learning (DL) system that automatically scans workers' hands for hygiene hazards using computer vision. Our convolutional neural network (CNN), trained on a diverse dataset of hand images across different skin tones and lighting conditions, identifies wounds, infections, and excessive sweat with 83.4% accuracy—significantly outperforming manual inspections. The system processes live camera feeds with minimal latency, flagging high-risk cases for immediate review without disrupting workflow. Unlike conventional AI approaches, our DL-based solution provides precise, real-time detection while reducing false positives by 18% compared to previous methods. Future work will focus on deploying more powerful edge computing hardware and optimizing algorithms through neural architecture search to improve inference speed. This DL-powered approach demonstrates how advanced computer vision can transform food safety monitoring while maintaining operational efficiency in industrial settings.

Keywords: Deep learning, computer vision, hand hygiene, food safety, real-time detection, convolutional neural network, wound detection, infection identification, hygiene monitoring, neural networks, industrial automation, quality control, predictive analytics, image processing.

FORMULATION OF GUMMY CANDIES CONTAINING NANOCELLULOSE FOR DIABETES

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ABSTRACT

Hypoglycemia is a medical condition in which an individual's blood glucose levels drop significantly, and if not potentially treated, it can be extremely dangerous. The current study is devoted to the development of novel natural gummy candies for rapid glycemic management in the case of hypoglycemia. These gummy candies are prepared from nanocellulose-based biopolymers sourced from renewable resources and *Tridax procumbens* extract, which is known for its therapeutic properties.

Palm sugar, dates fruit extract, and lemon juice are added to these candies, providing them with an instant glucose boost along with nutritional benefits. Nanocellulose is integrated to provide a structural fortification and sustained active ingredient release for continued glucose delivery. The focus of this study is the preparation, optimization, and characterization of the gummy candies for their bioactivity, safety, and efficacy for the treatment of hypoglycemia. So, this is novel yet economical, non-invasive and more convenient solution to hypoglycemia especially in diabetic patients. This research provides a viable substitute for traditional glucose supplements that will assist in advancing functional food commodities to the health care industry.

Keywords: Nanocellulose, *Tridax procumbens*, Gummy candies, Biopolymer, Glucose Supplement.

DEVELOPMENT OF NANO ENCAPSULATION FORMULATION OF EFFECTIVE MICROORGANISM AS BIOFERTILIZER

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ABSTRACT

The production of environmentally friendly biofertilizers involves the use of sustainable farming technologies and a variety of beneficial microorganisms. Microorganisms have long been used as biofertilizers. However, due to a few constraints such as low stability, viability, and regulated release of biofertilizers, their application is limited. The current study is focused on the creation of nano-encapsulated effective microorganism biofertilizers to improve the stability, viability, and delivery of beneficial microorganisms to soil and crops. We used unique nano-encapsulation approach to include an effective microorganism in biodegradable polymer matrices. This method not only preserves microorganisms from environmental stressors, but also allows for their regulated release into the soil, which improves plant nutrient uptake. The formulation was improved in terms of polymer content, encapsulation efficiency, and release kinetics. The results showed that nano-encapsulated effective microorganism biofertilizers have enormous potential for raising agricultural productivity sustainably by improving plant growth, soil fertility, and microorganism activity in the system. The created nano-encapsulated biofertilizer is expected to improve nitrogen fixation efficiency, stimulate plant development, and extend microbial viability in soil conditions. This study focuses on integrating nanotechnology applications with microbiological methods in agricultural productivity. The development of the nano-encapsulated effective microorganism biofertilizer was a significant advance toward more sustainable farming practices. Future research will include scaling up production and examining the long-term impacts of this novel mixture on diverse crop kinds.

Keywords: Biofertilizer, sustainable farming, nano-encapsulated effective microorganism, nanotechnology, agricultural productivity

DESIGN AND OPTIMIZATION OF PORTABLE ZEOLITE-BASED OXYGEN CONCENTRATORS FOR REMOTE AREA

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ABSTRACT

Medical oxygen supplies are mostly very low in remote areas where peoples are with respiratory problems. This research will help in resolving the problem by development of portable zeolite-based oxygen concentrator to those problematic areas. Zeolites are materials which has great adsorption property which can be efficiently used to separate the oxygen from the air where the air is compressed which is reliable and portable to use. Mainly oxygen concentrators are focused for designing it in portable manner and easy to use and for making it durable for tough conditions. These devices showed that it can produce high-purity oxygen at fixed flow rate which meets the medical standards. This innovation technology not only resolves the demand of oxygen supply in remote areas but also helps in betterment of respiratory problems.

Keywords: Oxygen Concentrator, Air separation, pressure swing adsorption, zeolite, Percent Saturation Oxygen

DESIGN OF WRIST WATCH FOR ALZHEIMER DISEASE DETECTION

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ABSTRACT:

This project introduces an innovative wearable tracking device specifically designed to enhance the safety and support of Alzheimer's patients and their caregivers. As the incidence of Alzheimer's disease grows, there is a pressing need for advanced, reliable, and user-friendly monitoring solutions that can address the unique challenges faced by patients and those who care for them. The proposed device, built on the Arduino Nano microcontroller, integrates an OLED display and GSM technology to create a comprehensive monitoring system that is both effective and accessible. The core functionality of the device revolves around conducting regular safety checks to ensure the well-being of the patient. Every 15 minutes, the device prompts the wearer through an OLED display to confirm their safety status. This interaction is designed to be simple and non-intrusive, requiring the patient to respond within 30 seconds. If the patient fails to respond within this timeframe, the system automatically triggers an alert message to be sent to designated caregivers. This alert includes the patient's GPS location, made possible by the GSM module, allowing caregivers to quickly locate and assist the patient if necessary.

This feature is particularly crucial in preventing and responding to wandering incidents, which are common and potentially dangerous for individuals with Alzheimer's. The device offers several key advantages that make it an invaluable tool in Alzheimer's care. Firstly, its real-time monitoring and alert capabilities ensure that caregivers are immediately informed of any potential issues, significantly reducing the response time in emergencies. The integration of GPS technology further enhances the device's utility by enabling precise location tracking, which is essential for ensuring patient safety. Additionally, the device is designed with cost-effectiveness in mind, making it accessible to a broad range of users and providing a practical solution for many families and caregivers.

Keywords: Wearable Tracking Device, GSM Technology, Alzheimer's Disease, Dementia, SOS Button, Real-Time Monitoring, Patient Safety, Caregiver Support, Assistive Technology, Cost-Effectiveness, Non-Intrusive Design

ECOGREY: A SMART KIT FOR GREY WATER MONITORING AND SAFE REUSE

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ABSTRACT

EcoGrey is an innovative, hand-carrying kit that detects grey water in real time with the help of electrochemical sensors, ensuring water safety and averting the transmission of diseases carried by water. Greywater management is important for the environment's sustainability and public health as urbanization and water shortage grow. A cost-effective, user-friendly solution that enables people, homes, and municipalities to analyze water quality without technical training. EcoGrey operates through a straightforward process: water sampling, electrochemical detection of contaminants, signal processing via a microcontroller, and real-time data display on an intuitive screen. Long-term dependability is ensured by the system's temperature control, data logging, remote monitoring, and sensor calibration features. An electrochemical sensor, a microcontroller, a signal amplification circuit, an ADC, and a power-efficient display are all important components housed in a small design. At production costs between ₹17,230 and ₹38,540 per unit, EcoGrey provides an affordable option for traditional water quality testing. With its ease of use, scalability, and real-time monitoring, it is a priceless instrument for community water management, municipal wastewater monitoring, and home water management. EcoGrey promotes safe water reuse, reduces health risks, and supports a sustainable water management system by providing quick and dependable water testing.

Keywords: EcoGrey, Grey water monitoring, Electrochemical sensors, Water safety ,Waterborne diseases prevention, Real-time data, Cost-effective solution.

DESIGN AND FABRICATION OF AUTOMATIC WASTE SEGREGATION MACHINE USING CONVEYOR BELT SYSTEM

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ABSTRACT

Efficient solid waste management is essential for environmental sustainability and resource conservation. Traditional waste segregation methods rely heavily on manual labour, which is time-consuming, inefficient, and poses health risks to workers. To address these challenges, this project focuses on the design and fabrication of an automatic waste segregation machine integrated with a conveyor belt system to enhance the speed and accuracy of waste sorting. The system utilizes a conveyor belt to transport waste through various sensor-based sorting mechanisms that classify materials into categories such as metal, plastic, organic, and non-recyclable waste. Advanced technologies, including sensors for metal detection, and segregation, are implemented to enable automatic sorting. Once classified, the waste is directed to designated bins, minimizing human intervention and improving efficiency.

The machine is designed to be cost-effective, scalable, and energy-efficient, making it suitable for urban waste management systems, recycling plants, and smart city initiatives. The automation of waste segregation enhances recycling rates, reduces landfill waste, and contributes to cleaner and more sustainable environments. This model highlights the design considerations, fabrication process, working principles, and performance evaluation of the proposed system, demonstrating its potential to revolutionize waste management practices.

Keywords: Waste Segregation, Conveyor Belt System

SKIN DISEASE DETECTION USING MOBILENET DEPLOYED ON RASPBERRY PI WITH TELEGRAM BOT INTEGRATION

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ABSTRACT:

Skin cancer is a critical health concern, and early detection plays a vital role in improving treatment outcomes. This project presents an enhanced skin cancer detection system that classifies diseases such as Basal Cell Carcinoma and Actinic Keratosis/Intraepithelial Carcinoma using a hybrid deep learning approach. While the existing system utilized MobileNet CNN deployed on Raspberry Pi, we propose an improved method by incorporating ResNet alongside MobileNet through transfer learning to achieve higher accuracy. The system follows a Telegram chatbot-based workflow, where users upload an image, which is then sent to the Raspberry Pi for processing. The image undergoes preprocessing, and classification is performed using the MobileNet and ResNet models, fine-tuned through transfer learning for optimized performance. The predicted disease, along with a confidence score, is then sent back to the user via the Telegram chatbot, providing more reliable and insightful results. By integrating ResNet with MobileNet, our approach leverages the advantages of both models—MobileNet's lightweight efficiency and ResNet's deep feature extraction capability—to enhance diagnostic accuracy. Additionally, the confidence level indicator helps users assess the reliability of the prediction. This improved system offers a cost-effective, real-time, and user-friendly solution for automated skin cancer detection, making it highly suitable for clinical and telemedicine applications.

Keywords: Skin Cancer Detection, Deep Learning, MobileNet, ResNet, Transfer Learning, Raspberry Pi, Image Classification, Telegram Chatbot, Confidence Score, Automated Diagnosis, Feature Extraction, Preprocessing

**ETHICAL AND EFFICIENT MANAGEMENT OF BIOMEDICAL WASTE
USING WIRELESS ROBOTIC SYSTEM A SOLUTION TO ENSURE
HEALTH, SECURITY, SAFETY, AND ENVIRONMENTAL
RESPONSIBILITY IN HOSPITAL WASTE**

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ABSTRACT

Biomedical wastes being handled in health institutions give rise to numerous difficulties owing to the need for very high hygiene and disposal measures. However, the advanced state-of-the-art robotic system could possibly solve the problem of its former modes of operation in the waste management processes of aging biomedical wastes. An advanced robotics system comprises self-managing equipment moving biomedical wastes from certain collection points to specified disposal sites, such as landfills. An advanced camera-based navigation technology that detects and precisely avoids obstacles is at the heart of how the system runs. The robot safely and autonomously traverses a complicated hospital environment while handling waste on time and without delay; furthermore, the operator utilizes a Bluetooth control interface via which the core activities of the robot can be monitored and controlled from afar. Scheduling and operating flexibility is thus incorporated. The facility reduces the risks of contamination and protects hospital humans from direct contact with the hazardous waste. It is coupled with real-time updates and further automations that subsequently enhance waste management to ensure that biomedical waste handling is within the safety regulations and hygiene standards. This robotic solution indeed promises a major paradigm shift in the management of wastes from health care services by enhancing operational efficiency and promoting safety and environment sustainability in health care installations.

Keywords: Biomedical Waste Management, Robotic system, camera based navigation, obstacle detection, waste loading process, smart waste disposal, remote operation, waste tracking system.

DETECTION OF GLAUCOMA BY MEASURING THE EYE PRESSURE WITH THE HELP OF SOFTWARE (MACHINE LEARNING)

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ABSTRACT

Glaucoma is a leading cause of irreversible blindness worldwide, primarily caused by increased intraocular pressure (IOP) leading to optic nerve damage. Early detection is crucial to prevent vision loss, but traditional diagnostic methods can be time-consuming and costly. This study proposes a machine learning-based approach for the early detection of glaucoma using eye pressure data. A dataset of IOP measurements was analyzed using various machine learning algorithms, to classify patients as glaucomatous or non-glaucomatous. The models were trained and validated on labeled clinical data, achieving high accuracy in predicting glaucoma risk. The results demonstrate that machine learning techniques can enhance the efficiency and accuracy of glaucoma screening, enabling early diagnosis and intervention. This approach has the potential to assist ophthalmologists in decision-making and improve patient outcomes through timely treatment.

Keywords: Glaucoma, Intraocular Pressure (IOP), Machine Learning, Early Detection, Ophthalmology, Medical Diagnosis, Eye Health, Predictive Analytics.

IOT BASED SMART INHALER

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ABSTRACT

Asthma management remains a significant challenge due to poor drug adherence and environmental factors. This study investigates the design and deployment of a smart asthma inhaler connected with 3IoT to improve asthma control through real-time monitoring and data-driven insights. The smart inhaler includes dose count detection and reminder messages to ensure consistent medication adherence. In addition, the smart inhaler includes gas sensors that monitor the temperature, humidity, and air quality of the surrounding area, giving users with proactive alerts about potential asthma triggers. All acquired data is safely saved in a cloud database, allowing for ongoing tracking and long-term analysis. This system not only automates drug tracking but also provides personalised insights to patients and healthcare providers, hence enhancing illness management. The proposed system aims to reduce asthma exacerbations, improve treatment compliance, and contribute to data-driven clinical decision-making. The proposed system is controlled by ESP 32 [Microcontroller and IoT module]. All the sensors are connected to the ESP32 IoT module. This IoT module continuously transmits the sensor data to Think Speak public domain IoT cloud platform. This IoT cloud is accessed by the user and the physician using proper authentication API keys and device ID. An android based mobile application is designed to alert the subject who uses the smart inhaler that indicates puff count, environment pollution level.

Keywords: IoT, Asthma, Smart Inhaler

AUTONOMOUS OBSTACLE DETECTION AND AVOIDANCE SYSTEM FOR ARDUINO-BASED MOBILE ROBOTS

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ABSTRACT:

The project an autonomous obstacle-avoiding robot vehicle system using the Arduino microcontroller as its core technology. This project adds to the expanding field of autonomous navigation systems by developing an affordable and efficient self-steering robot vehicle design which operates through an Arduino framework. A real-time distance measurement for vehicle obstacles by using an ultrasonic sensor. The system enables detection of objects using the sensor through defined distance thresholds which after detection initiate an automated avoidance algorithm managed by DC motor controls to reshape the robot's movement path. The sensor-processing-actuation sequence allows the robot to automatically move through difficult spaces without any human involvement. The basic operational principle allows scalable implementation in various domains because it delivers reliable practical execution. The robot finds several practical uses for inventory management in warehouses through automated navigation among shelves and personnel and in dangerous search operations and service situations that demand autonomous movement. This project proves the united operation of sensory perception with microcontroller programming and electromechanical systems through a demonstration of Arduino's development platform for automated vehicles. The platform functions for navigation obstacle detection and provides instructional value because it teaches basic robot controls as well as sensor insertion methods and control system structure. The modular design system enables programmers to attach new sensors and machine learning components and communication systems that enhance operational capabilities.

Keywords: Autonomous Navigation, Obstacle Avoidance, Arduino Robotics, Ultrasonic Sensing, Self-Driving Vehicle

STUDY ABOUT EMOTIONS USING VARIOUS PARAMETERS

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ABSTRACT

The study of human emotion poses yet another complex challenge and consists of an interplay of physiological, psychological, and behavioral parameters. Human emotions are being studied with numerous measurable parameters, such as heart rate variability, facial expression, bodily gesture, and self-reported psychological states. AI-based emotion recognition typically depends on the use of machine learning models, while the current research adopted classical statistical and qualitative methods to interpret emotional response. The study then aims to further understand the transitions of emotions from one case to another and across situations while bringing important key issues along the way, such as the limitations of automated

Keywords: Facial, detection, vision, machine learning, convolutional neural networks.

SELF-STABILIZED GYRO TOOTHBRUSH FOR PARKINSON'S DISEASE: ENHANCING ORAL HYGIENE THROUGH REAL-TIME MOTION COMPENSATION

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ABSTRACT:

The increasing condition of neuro-degenerative increases the need of assistive device that facilitate the daily activities. Oral hygiene is the aspects of overall health, and the individuals with Parkinson's disease and some with similar condition often struggle with tasks like toothbrushing due to tremor. Parkinson's disease is a neurodegenerative disorder caused by the degeneration of dopamine in the midbrain leading to motor symptoms like tremor, rigidity and other motor impairments. In effort to help the people with Parkinson's disease and people with the special needs to maintain their oral hygiene, a "self-stabilized gyro toothbrush" with real time motion compensation technology system is being developed. Often hand tremors making it like a task, and difficult for people to do daily activities like brushing their teeth, which result in poor oral hygiene and oral related problems. To overcome these challenges this project developing a self-stabilized system that adjust for involuntary motions and make sure for safe and efficient brushing. This method uses real-time motion compensation technology to enhance the quality of life for the peoples those with mobility issues and people with motor impairments, by addressing a critical medical need in a useful-way.

Keywords: Parkinson's disease, Tremors, Involuntary movements, Self-stabilizing Mechanism, Brush.

SDF SLAM: CNN-DRIVEN REAL-TIME MAPPING OF UNKNOWN ENVIRONMENT AND PATH PLANNING

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ABSTRACT:

Inspired by the advantages of hierarchical feature extraction in deep learning, this work investigates the development of a Convolutional Neural Network (CNN) algorithm to solve the problem of Model environment mapping and path planning in an unknown environment. In this paper, SDF SLAM (Signed Distance Function Simultaneous Localization and Mapping) is applied to allow the Model to localize itself and map its surroundings in real-time, even without a prior map. Camera pose estimation is utilized in conjunction with stereo vision-based feature extraction and distance measurement to improve the accuracy of the system. A Region of Interest (ROI) in the rectified image pair is selected for optimization, and the ROI is processed to generate a disparity map, which helps estimate distances from objects in the environment. A 3D semantic map is reconstructed using the depth information from stereo vision, combined with Model orientation and camera pose data. This 3D map forms the foundation for accurate environment mapping. Path planning is enabled by combining this map with additional data from the Model's and camera pose estimation, ensuring robust navigation. The processing time of the system is optimized through ROI implementation, ensuring that mapping and path planning can be performed efficiently with a* algorithm. A dataset containing RGBD depth images, data and camera pose estimates further enhances the CNN's ability to perform accurate path planning. The performance of the CNN is evaluated based on training options, hyperparameter tuning, and precision. The final results show that the CNN algorithm achieves an accuracy level of 64%, with a corresponding loss value of approximately 0.34. This accuracy can be further improved by increasing the dataset size, incorporating Model orientation and camera pose estimates, and fine-tuning hyperparameters. For real-time applications, the system must maintain low processing time for mapping and path planning to remain competitive with other methods. The Model with this system implemented is able to generate environment maps and plan optimal paths within the test field, demonstrating the system's potential for real-world use.

Keywords: Convolutional Neural Network (CNN), Hierarchical Feature Extraction, Path Planning, SDF SLAM (Signed Distance Function Simultaneous Localization and Mapping), Camera Pose Estimation, Stereo Vision, 3D Semantic Mapping, Region of Interest (ROI), A* Algorithm

PARKTROVE: REVOLUTIONIZING URBAN PARKING WITH SMART TECHNOLOGY

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ABSTRACT:

Urban parking congestion remains a persistent challenge, leading to unnecessary fuel consumption, time delays, and environmental harm. ParkTrove is a next-generation smart parking solution designed to transform the urban parking experience by offering real-time availability updates, seamless navigation, and effortless transactions. Harnessing the power of IR sensors and advanced object detection in Python, ParkTrove ensures accurate and efficient identification of parking slot availability. The system seamlessly integrates with a backend to process real-time data, delivering an interactive and intuitive parking map through the ParkTrove mobile application. With features such as instant booking, smart navigation, and cashless transactions, users can enjoy a hassle-free experience. Built on a robust frontend and backend framework, ParkTrove is more than just a convenience—it is a step toward reducing traffic congestion, optimizing space utilization, and enhancing urban mobility. Launched in Chennai, this innovative system is poised for future expansion, with AI-driven predictive parking solutions on the horizon. ParkTrove isn't just a parking solution; it's a movement toward smarter, greener, and more efficient cities.

Keywords: Object Detection, Smart Parking, online booking, Python, Map Integration, Navigation, Traffic Optimization.

CERTILEDGER**(Certificate verification and validation using Blockchain technology)**

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ABSTRACT

In recent years, the issuance and validation of certificates have become increasingly important across various fields like education, employment, and professional certifications. However, traditional methods for verifying certificates often face challenges such as fraud, data manipulation, and slow verification processes. Enter blockchain technology, which presents a compelling solution thanks to its key features of immutability, transparency, and decentralization. This project introduces a system for verifying and validating certificates using blockchain technology to guarantee their authenticity, security, and integrity. The proposed system employs Ethereum-based smart contracts to securely store, verify, and validate certificate data on the blockchain. Once a certificate is issued, its details are safely recorded in a decentralized ledger, making it tamper-proof and easily verifiable by the public. Each certificate is given a unique identifier linked to the recipient's information, including the student's name, course details, and the date it was issued. This identifier simplifies the verification process for third parties, allowing them to confirm the authenticity of certificates without needing to rely on central authorities. Once data is recorded on the blockchain, it cannot be altered or tampered with, ensuring the integrity of the certificates. Anyone with access to the blockchain can verify the authenticity of a certificate, creating a transparent process for all parties involved. By using a decentralized network, there is no central point of failure, reducing the risk of fraud or system failure.

Keywords: Blockchain, Ethereum, Smart contract, Tamper-proof.

BIOMOTION LOCK: GAIT RECOGNITION FOR SECURE NFC PAYMENTS

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ABSTRACT

Transitioning from outdated cryptographic security to an AI-enhanced behavioral biometric authentication system transforms Near Field Communications (NFC) payment security. This method enables faster fraud detection, fresh verification mechanisms, and adaptive risk valuation in transactions. This project proposes an advanced cryptographic technique to enhance the real-time Behavioral Biometric for safer transactions. Unlike predictable systems, our Machine learning approach proposes a Machine learning algorithms to process gait recognition for dynamic fraud prevention. While AI significantly enhances security, but it doesn't replaces the out-of- date cryptographic methods but rather enhances them with intelligent decision-making approach. The Experimental evaluations determines a significant reduction in fraudulent transactions, improved real-time authentication, and enhanced adaptability to emerging threats. This work lays the first step for the next generation of secure, efficient, and intelligent NFC payment ecosystems, bridging the gap between classical cryptography and AI-powered security frameworks.

Keywords: AI-enhanced behavioral Biometric Authentication, NFC payment security, Dynamic Fraud prevention, Real-time authentication, Intelligent Decision-making

POWERED TELEGRAM OSINT TOOL FOR CYBER THREAT DETECTION AND ANALYSIS

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ABSTRACT:

Telegram has emerged as a vital platform for various online communities, including cybercriminals who exploit its anonymity for illicit activities such as investment scams, phishing attacks, and dark web transactions. Traditional keyword-based monitoring tools often fail to understand context, leading to false positives and ineffective tracking. To address this issue, we propose an AI-powered Open-Source Intelligence (OSINT) tool designed to analyze Telegram messages, detect fraudulent content, and provide real-time intelligence to mitigate cyber threats. This tool leverages Telegram scraping, Natural Language Processing (NLP), and OpenAI's models to detect scams, fraud, phishing attempts, and dark web-related activities. By combining real-time keyword-based monitoring, AI-driven sentiment analysis, contextual risk evaluation, and graphical trend visualization, the tool offers deep insights into suspicious activities. The integration of OpenAI enhances accuracy and interactivity, allowing users to query risks and obtain meaningful insights. The system is tailored for cybersecurity researchers, law enforcement agencies, and analysts to strengthen threat intelligence. Key functionalities include real-time Telegram message extraction, AI-powered risk analysis, sentiment classification, keyword tracking for cyber threats, and interactive AI-based threat queries. Additionally, visualization features such as word clouds, sentiment graphs, and detailed logs enhance usability. This AI-powered OSINT tool aims to revolutionize Telegram cyber threat monitoring, offering a robust and automated solution for cybersecurity professionals.

Keywords: Telegram OSINT, Cyber Threats, Fraud Detection, AI powered analysis,
Cyber Threats, AI-powered Analysis Fraud Detection, Natural Language Processing (NLP)

VULNSCANPRO FOR CYBER THREAT DETECTION & ANALYSIS

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ABSTRACT

In the fast-paced world of cybersecurity, the need for automation in vulnerability assessment is paramount. Manual scanning of systems using multiple tools not only consumes significant time but also increases the likelihood of missing critical vulnerabilities. VulnScanPro is designed to address these challenges by integrating multiple security scanning tools into a single automated framework. This tool streamlines the vulnerability discovery process, improves accuracy by correlating results, and saves time for penetration testers and security analysts. Modern penetration testing involves leveraging numerous tools to detect vulnerabilities in target systems. However, running these tools sequentially without automation can be laborious. VulnScanPro simplifies this by executing multiple tools simultaneously, aggregating the results, and presenting actionable insights under one interface. Built upon the robust architecture of vulnscanpro this tool supports Python 3 and aligns with the latest scanning methodologies. Automated Vulnerability Assessment – VulnScanPro integrates multiple security scanning tools into a single framework, reducing manual effort and improving efficiency. Enhanced Accuracy – By correlating results from different scanners, VulnScanPro minimizes false positives and ensures comprehensive vulnerability detection. Time-Saving and Streamlined Process – The tool executes multiple scans simultaneously, eliminating the need for sequential manual execution and accelerating vulnerability assessments.

Keywords: Cybersecurity, automation, vulnerability assessment, scanning, security, penetration

SMART PLANT AI DRIVEN IOT BASED MONITORING SYSTEM

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ABSTRACT:

Smart Plant, an AI and IoT powered intelligent plant monitoring system designed to reduce manual labour and ensure timely irrigation. This system automates watering with a relay-controlled water pump and also address real-world agricultural and gardening challenges such as water waste, plant neglect, and lack of environmental awareness. This system is built on the ESP32 microcontroller which continuously monitors the soil moisture, temperature, humidity, air pressure, and water levels using various real time sensors on a web interface, making it easy for users to track plant health remotely. The Smart Plant offers a unique human-like experience by responding to user queries using a chatbot powered by the Groq API, generating context-aware replies based on current sensor data. The OpenWeather API integration allows the plant to adapt its behaviour based on live weather updates. The smart plant makes the plants to give the voice alert and visually expresses its condition using AI. This project not only promotes smart gardening but also offers a scalable solution for precision agriculture, urban farming, and educational applications—helping conserve resources, enhance plant care, and make agriculture more engaging and efficient.

Keywords: Smart Plant, ESP32, IoT, Smart Irrigation, Real-Time Monitoring, Precision Agriculture, AI Chatbot, Environmental Awareness, Automated Watering System, Web Dashboard.

**CAMPV: THE ULTIMATE HUB FOR STUDENT ENGAGEMENT
THROUGH A CAMPUS-CENTRIC SOCIAL PLATFORM**

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ABSTRACT:

CampV is an all-in-one campus platform designed to streamline various student activities, ensuring a more connected and efficient college experience. Many students face challenges in accessing career opportunities, managing events, and engaging with campus communities due to fragmented solutions. CampV integrates multiple features into a single mobile application, addressing these issues through a user-friendly interface. Key features include Event Management, Career & Internship Listings, Scholarships, Community & Clubs, College Navigation, Lost and Found, Suggestion Poll & Box, Nearby Hotel Listings, a Marketplace, and an AI Chatbot for student assistance. The application is built using modern web and mobile technologies, with a secure backend ensuring real-time updates and data security. Users can interact with these features through a mobile interface, sending and receiving information seamlessly. By centralizing campus-related services, CampV enhances student engagement, convenience, and overall campus life.

Keywords: Campus platform, student services, event management, career opportunities, mobile application, student engagement, AI chatbot.

AI DRIVEN RECONNAISSANCE**DHINESH & RUBA KRISHNA**

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ABSTRACT

Reconn.ai is an advanced AI-powered reconnaissance tool designed to enhance and streamline the initial phase of cybersecurity assessments. This platform enables penetration testers, security researchers, and ethical hackers to efficiently gather and analyze crucial intelligence on domains and IP addresses, facilitating more informed decision-making in security evaluations. The primary goal of Reconn.ai is to provide a comprehensive and user-friendly environment where testers can generate detailed reports encompassing key security insights. DNS Record Analysis – Extracts domain-related records, to uncover potential security misconfigurations. Open Port Detection – Identifies active services and open ports, assessing their exposure to potential cyber threats. Configuration & Security Risk Assessment – Evaluates misconfigurations, outdated services, and common security risks that may lead to vulnerabilities.

At the core of Reconn.ai lies a locally optimized AI model, specifically trained for cybersecurity tasks. This model automates critical reconnaissance activities, providing Deep Analysis – Automated data parsing to identify patterns and anomalies within the collected information. Risk-Based Reporting – AI-generated reports that categorize vulnerabilities by severity, aiding security professionals in prioritizing threats. Mitigation Strategies – Actionable recommendations for securing identified vulnerabilities, reducing attack surfaces, and improving system resilience. By integrating AI-driven automation, Reconn.ai significantly reduces the time and effort required in the reconnaissance phase, making it an essential tool for penetration testers seeking an efficient and intelligent approach to cybersecurity assessments with enhanced accuracy, speed, and reliability.

Keywords: penetration testing, reconnaissance, artificial intelligence

SMART BLIND OBSTACLE DETECTION AND NAVIGATION SYSTEM

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ABSTRACT:

Visually impaired individuals face significant challenges in mobility and navigation, often relying on traditional aids such as canes or guide dogs. To enhance their independence and safety, this project proposes the development of a Smart Blind Obstacle Detection and Navigation System that assists users in detecting and avoiding obstacles while navigating their surroundings. The system is built around an ultrasonic sensor interfaced with an Arduino UNO, which continuously scans the environment to measure the distance of nearby objects. The detected data is processed and transmitted via Bluetooth communication to a dedicated smartphone application. The application interprets the sensor data and provides real-time voice alerts to the user, notifying them about obstacles in their path. Additionally, the system incorporates a basic mapping mechanism that helps users understand their surroundings better. To ensure portability and long-term usability, the device operates on a rechargeable battery, allowing continuous usage without frequent replacements. The combination of sensor-based detection, wireless communication, and smartphone integration makes this system an affordable, efficient, and user-friendly assistive technology. By leveraging embedded systems and mobile application development, this project aims to provide an innovative, cost-effective, and accessible solution for visually impaired individuals, significantly improving their ability to navigate safely and independently in various environments.

Keywords: Smart Navigation System, Obstacle Detection, Ultrasonic Sensor, Arduino UNO, Bluetooth Communication, Assistive Technology, Visually Impaired Mobility.

**BIOLIFT EYE & WRINKLE GEL: THE ULTIMATE ORGANIC
SOLUTION FOR YOUTHFUL SKIN**

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ABSTRACT:

The BioLift Eye & Wrinkle Gel is a scientifically formulated skincare solution designed to target fine lines, wrinkles, dark circles, and under-eye puffiness. It integrates cutting-edge ingredients, including advanced peptides like Argireline and copper peptides to enhance collagen production and skin firmness. Natural retinol alternatives, such as bakuchiol and cacay oil, provide anti-aging benefits without irritation. The formulation also features plant stem cells, potent botanical extracts, ultra-hydrating agents like polyglutamic acid, and ceramides to strengthen the skin barrier. Caffeine and ginseng extract boost circulation to reduce puffiness, while antioxidants such as astaxanthin and lutein offer protection against oxidative stress and blue light damage. The formulation ensures stability, with tests confirming consistency in pH, color, texture, and odor. BioLift Eye & Wrinkle Gel exemplifies a blend of innovative dermatological science and clean beauty principles, providing an effective and gentle solution for youthful, radiant skin.

Keywords: BioLift Eye, Wrinkle Gel, Argireline, copper peptides

NATURE’S HEALING TOUCH: CABBAGE SEED OIL FOR JOINT RELIEF

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ABSTRACT:

In the quest for natural, sustainable solutions to manage knee pain, Cabbage Seed Oil emerges as an unexpected but powerful contender. Often overlooked in favor of more mainstream treatments, this plant-based oil is packed with nature's own healing compounds that target the root causes of knee discomfort. Extracted from the humble seeds of the cabbage (*Brassica oleracea*), cabbage seed oil is a treasure trove of omega-3 fatty acids, antioxidants, and anti-inflammatory agents. Innovatively bridging the gap between traditional herbal remedies and modern joint care, cabbage seed oil holds the potential to reduce inflammation, improve joint mobility, and accelerate tissue regeneration. Its unique combination of glucosinolates, polyphenols, and essential vitamins, like A, C, and E, helps repair cartilage damage, protect against oxidative stress, and alleviate chronic knee pain, making it an ideal natural alternative to harsh pharmaceuticals. The oil’s topical application is particularly revolutionary, as it enhances blood circulation, nourishes the skin, and provides direct relief to the knee joint, all while being free from chemical additives. Whether used as a soothing massage oil or as part of a comprehensive treatment regimen, cabbage seed oil offers a holistic approach to joint health—without the side effects often associated with conventional pain relief medications.

Keywords: Sustainable Healing, Nature’s Power for Joint Health, Innovative Pain Management, Eco-Friendly Alternative, Holistic Knee Pain Relief, Future of Natural Remedie

NEXT-GEN ANTI-UV GLARE SUNSCREEN FOR SENSITIVE SKIN

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ABSTRACT:

The sunscreen formulation integrates state-of-the-art sun protection and skincare technologies to provide broad-spectrum defense against UVA, UVB, blue light, and infrared radiation. It features advanced UV filters, including Tinosorb A2B, Mexoryl SX & XL, and encapsulated zinc oxide, ensuring superior photostability and non-whitening mineral protection. To combat digital and environmental stressors, it incorporates lutein, zeaxanthin, and deep-sea ferment extracts for blue light and infrared shielding. Powerful antioxidants such as astaxanthin, Swiss apple stem cells, and a ferulic acid-vitamin complex provide enhanced skin repair and anti-aging benefits. The formula includes hydrophobic film-forming polymers and marine biopolymers for superior sweat and water resistance, while beta-glucan and ceramides support long-lasting hydration. Additionally, oil-control agents like boron nitride and witch hazel ensure a matte, shine-free finish. Smart encapsulation systems enhance ingredient stability and penetration, with phase-change microcapsules offering a refreshing cooling effect. Clinical evaluations demonstrate the formulation's efficacy in maintaining skin tone and preventing photodamage, reinforcing its biocompatibility and advanced skin-protective benefits.

Keywords: Sunscreen, ferulic acid-vitamin complex, Tinosorb A2B, copper peptides.

FORMULATION AND EVALUATION OF VEGAN HAIR TINT : AN ECO- FRIENDLY PROCESS

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ABSTRACT:

The formulation and evaluation of a vegan hair tint developed using natural, eco- friendly ingredients. The is to provide a sustainable alternative to conventional hair dyes which often harmful chemicals. The formulation process involved the selection of plant-based pigments and bio-compatible additive's to ensure both safety and efficacy. A series of hair tints were formulated using a combination of natural powder of cumin, mustard, fenugreek and essential oil. Results indicated that the vegan hair tint not only needs performance standards comparable to traditional dyes but also offers superior environmental benefits. It also enhance the new hair in the scalp. This innovation in hair coloration demonstrates the feasibility of sustainable beauty product while promoting ethical practices within the cosmetics industry.

Key words: Vegan hair tint, Eco-friendly, Natural ingredients, Plant based pigments, User satisfication, Environmental responsibility.

FORMULATION AND EVALUATION OF A NOVEL POLYHERBAL PEEL-OFF FACE MASK

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ABSTRACT

The demand for natural skincare has driven the development of polyherbal formulations with multiple dermatological benefits. This study focuses on formulating and evaluating a polyherbal peel-off face mask enriched with hibiscus (*Hibiscus rosa-sinensis*), chrysanthemum (*Chrysanthemum indicum*), and neem (*Azadirachta indica*) extracts, known for their antioxidant, anti-inflammatory, antimicrobial, and skin-rejuvenating properties. The herbal extracts were obtained through hydroalcoholic extraction (70:30 ethanol-water) and maceration, then incorporated into a base containing polyvinyl alcohol (PVA), glycerin, aloe vera gel, honey, Multani mitti, rose water, and essential oils. The formulation was assessed for physicochemical properties (pH, consistency, spreadability, drying time), peelability, impurity removal efficacy, and skin safety. Results confirmed that the polyherbal peel off mask was stable, homogeneous, and effective in exfoliating dead skin cells, improving hydration, and enhancing skin tone. The synergistic action of the herbal components contributed to anti-aging, anti-acne, and UV protection, positioning the formulation as a promising natural alternative to synthetic masks. Future studies may explore additional botanicals to enhance its therapeutic benefits.

Keywords: Polyherbal, Peel-Off Face Mask, Hibiscus, Chrysanthemum, Neem, Skincare.

HYPO SHIELD: HIGHLIGHTS THE SOAP'S HYPOALLERGENIC PROPERTIES

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ABSTRACT

Hypo shield is a revolutionary soap specifically designed for sensitive skin, offering unparalleled hypoallergenic properties. This gentle yet effective cleanser is carefully crafted to minimize the risk of allergic reactions, making it an ideal solution for individuals with delicate skin. Hypo shield's unique blend of ingredients is carefully selected to reduce the risk of allergic reactions and skin irritation. Our soap effectively cleanses the skin without stripping it of its natural oils, maintaining the skin's natural barrier function. Hypo shield's soothing properties help to calm and comfort sensitive skin, reducing redness and inflammation. Our soap has undergone rigorous dermatological testing to ensure its safety and efficacy for sensitive skin. Hypo shield's hypoallergenic properties minimize the risk of skin irritation and allergic reactions. Our soap's gentle and soothing properties help to comfort and calm sensitive skin. Hypo shield effectively cleanses the skin without compromising its natural barrier function. Hypo shield is an unparalleled hypoallergenic property, making it an essential solution for individuals with sensitive skin. It's gentle yet effective cleansing, soothing, and calming properties ensure improved skin comfort and reduced risk of allergic reactions.

Keywords: Hypoallergenic, Sensitive Skin, Gentle Soap, Allergy-Friendly, Skin Soothing.

TIMELESS RICE ELIXIR: AGELESS BEAUTY IN A BOTTLE

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ABSTRACT:

Rice water extract is a traditional beauty ingredient, which is rich in amino acids, antioxidants, and vitamins helps to promote skin hydration, brightening, and barrier repair. The study focuses on formulating a stable and effective rice water serum extract for skincare applications. The extract is obtained through controlled fermentation process to enhance bioavailability and efficacy. The formulation incorporates humectants, emollients, and stabilizers to optimize texture and absorption while ensuring long-term stability. Preliminary tests demonstrate improved skin hydration, elasticity, and radiance, supporting rice water's potential as a natural and effective skincare ingredient. Now a days Rice water extract has been widely recognized and popular for its skin-nourishing properties due to its rich composition of vitamins, amino acids, antioxidants, and minerals. This study focuses on developing a stable and effective skincare formulation utilizing rice water extract as a key active ingredient. The extract is obtained through optimized soaking and controlled fermentation to enhance bioavailability and boost the presence of skin-beneficial compounds such as ferulic acid, inositol, and peptides. The formulated integrates rice water extract with humectants (glycerine,hyaluronic acid) for enhanced hydration, emollients (squalane, ceramides) to support skin barrier function, and natural stabilizers to ensure product consistency and shelf-life. The formulation process prioritizes maintaining the integrity of bioactive compounds while achieving optimal pH balance and viscosity for skin application. The method is cost effective and innovative. Results Focus on Preliminary in-vitro and in-vivo assessments indicate improvements in skin hydration, elasticity, and overall radiance, demonstrating the potential of rice water extract as a natural and effective ingredient for skincare. This study highlights the feasibility of incorporating rice water extract into commercial skincare formulations, emphasizing its role in skin brightening, anti-aging, and barrier repair.

Key words: Rice water gel, Rice water extract serum, skin barrier function, skin-nourishing properties, skin hydration-anti aging.

FORMULATION AND EVALUATION OF HERBAL COSMETIC CREAM FOR EFFECTIVE SKIN NOURISHMENT

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ABSTRACT:

The demand for herbal cosmetics has significantly increased due to their safety, efficacy, and minimal side effects compared to synthetic formulations. This study focuses on the formulation and evaluation of a herbal cosmetic cream enriched with natural ingredients for effective skin nourishment. The cream is developed using beetroot, tulsi, turmeric, saffron, aloe vera gel, beeswax, and rose oil, each selected for their moisturizing, antioxidant, anti-inflammatory, and skin-brightening properties. The formulation process involves the incorporation of herbal extracts into a stable cream base, ensuring optimal spreadability, absorption, and long-lasting hydration. The prepared cream undergoes physicochemical evaluations such as pH, viscosity, spreadability, stability, and microbial contamination tests to ensure quality and efficacy. The results indicate that the formulated herbal cream has good stability, desirable texture, and excellent skin compatibility without causing irritation. The presence of natural bioactive compounds enhances skin hydration, reduces pigmentation, and improves overall skin health. The study highlights the potential of herbal cosmetics as a safe and effective alternative to synthetic skincare products.

Keywords: Herbal Cosmetics, Skin nourishment, Natural herbs, O/W cream, Evaluation.

DEVELOPMENT AND EVALUATION OF HERBAL FRUIT PEEL NAIL LACQUER AS A NATURAL REMEDY FOR NAIL FUNGAL INFECTIONS

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ABSTRACT

Onychomycosis is a fungal infection of the nail that is also notorious as dermatophytes onychomycosis or *Tineaunguium*. Dermatophytes, Candida, and non - dermatophytic molds are the pathogens that cause onychomycosis. The fruit peels of *Citrus sinensis* and *Punica granatum*, known for their antifungal properties, were collected and their powdered extracts were used for the activity studies. An attempt was made to investigate the antifungal activity of herbal nail lacquer formulated with fruit peels of *Citrus sinensis* (Rutaceae family) and *Punica granatum* (Lythraceae family) against *Candida albicans*. This study explores the formulation and evaluation of a novel nail lacquer utilizing fruit peel extracts as a natural and sustainable alternative to synthetic ingredients. The physical and chemical characteristics of the lacquer, including drying time, gloss, viscosity, pH, and color, were evaluated. In vitro antimicrobial and antifungal assays demonstrated the efficacy of the fruit peel extracts against common nail pathogens. This innovative formulation offers a natural, effective, and eco-friendly solution for nail care, while promoting sustainable use of fruit waste. It offers a promising alternative to conventional treatments for nail fungal infections, providing a safe and effective solution for individuals seeking a natural remedy

Keywords: Fruit peel, herbal extract, Herbal nail lacquer, evaluation, Anti-fungal activity

AROKIYA UNAVU - DISEASE-BASED FOOD RECOMMENDATION APP

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ABSTRACT

The "Arokiya Unavu" project aims to develop an AI-powered disease-based food recommendation app to help individuals make informed dietary choices based on their health conditions. The app will provide personalized food suggestions, nutritional benefits, and recipes for diseases such as Diabetes, Hypertension, Obesity, Liver Disease, and more. The integration of 3D food models offers an interactive user experience, while the AI chatbot assists users with dietary queries in Tamil and English languages. With features like voice search, a multi-language AI assistant, and a customized meal planner, the app ensures accessibility and engagement for users. By using reliable data from research journals, government health guidelines, and AYUSH, the app aims to offer over 1000 disease-specific food recommendations. The project also emphasizes real-time updates through a dynamic food and nutrition database, enhancing the user experience and providing continuous health alerts. The app is designed for both mobile and web platforms, ensuring widespread usability. This comprehensive solution combines health insights, AI, and 3D technology to foster better dietary practices and improve overall health management.

Keywords: AI-powered, Disease-based, Food recommendations, Nutritional insights, Personalized meal planner, 3D food models, Interactive UI, Web app, Chatbot, Multi-language support.

DEVELOPMENT AND FORMULATION OF A NOVEL WOUND HEALING CREAM INCORPORATING PEEPAL LEAF EXTRACT

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ABSTRACT:

This formulation is designed to create a therapeutic wound healing cream using Peepal Leaf Extract as the active ingredient. This cream combines a blend of aloe vera gel, beeswax, coconut oil, glycerine, white paraffin and cetostearyl alcohol creating a hydrating and soothing formulation. The main aim is to support skin regeneration and wound healing. The cream is formulated to address the skin wounds, abrasions, and irritations by promoting healing, reducing inflammation, and preventing infection. Peepal Leaf Extract accelerates the skin's natural healing process and it also show some antimicrobial and anti-inflammatory effects. The process begins by preparing the oil phase, melting Cetostearyl Alcohol, White Paraffin, and Beeswax at 70-75°C. The aqueous phase, consisting of Glycerine, is heated separately to the same temperature. Both phases are emulsified together, forming the cream base. Peepal leaf extract and aloe vera gel are added at room temperature to avoid thermal degradation. Salicylic Acid, Benzyl Alcohol, and Vitamin E are added for their therapeutic and preservative properties. Salicylic Acid exfoliates dead skin cells, facilitating smoother healing. Vitamin E supports skin regeneration and acts as an antioxidant. Benzyl Alcohol prevents microbial contamination and enhances shelf life. This Peepal Leaf Wound Healing Cream facilitates the healing of minor cuts, wounds, and skin irritations while providing moisturizing and protective benefits. The combination of natural healing agents and stabilizers makes this cream more effective for promoting healthy skin.

Keywords: Peepal leaf extract, wound healing, regenerative effects, aloe vera gel, vitamin E, hydrating.

PREPARATION AND EVALUATION OF TRANSDERMAL PATCHES USING CARROT SEED OIL FOR CRACKED HEELS.

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ABSTRACT

Carrot seed oil, rich in antioxidants and essential fatty acids, has been traditionally used for its medicinal properties. Carrot seed oil is a powerhouse of natural compounds and nutrients. The following compounds are present in carrot seed oil :Carotol is one of the primary components and gives the oil its therapeutic properties. Carotenoids are antioxidants derived from beta-carotene, known for supporting skin health. Vitamin-E is beneficial for moisturizing and protecting the skin from damage. Daucene and Daucol contribute to its antimicrobial properties. Other Sesquiterpenes offer anti-inflammatory and calming effects. This oil is often used in skincare, aromatherapy, and health applications for its rejuvenating and protective qualities. This study aimed to prepare and evaluate transdermal patches containing carrot seed oil for topical application. Transdermal patches were prepared using a solvent casting method and characterized for their physical properties, drug release kinetics, and in vitro permeation studies. The results showed that the patches exhibited controlled release of carrot seed oil and facilitated its delivery across the skin. The patches were found to be stable, non-irritating, and suitable for topical administration. This study demonstrates the potential of transdermal patches containing carrot seed oil for topical delivery, offering a promising approach for various dermatological applications.

Keywords : Transdermal patches, Carrot seed oil, Topical application, Skin delivery, Dermatological applications.

FORMULATION AND EVALUATION OF ORGANIC HAIR SERUM FOR THE TREATMENT OF VARIOUS HAIR COMPLICATIONS

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ABSTRACT

Cosmetics are becoming a part of our day-to-day life, contributing to personal grooming, self-confidence and a way to look attractive and elegant. Cosmeceuticals are cosmetic products that have restorative and pharmaceutical effects. They are formulated to boost healthy skin and hair. Hair serums are the cosmetic product that helps in improving appearance and well-being of the hair. It also helps to deal with other hair problems like frizziness, dryness and dullness. They are applied has coating on the hair surface. It controls the hair damage, enhances scalp health by strengthening the hair follicles and protects from heat and environmental damages. Now a days herbal hair serum are popular due to their efficacy and lesser side effects. The hair serum contains grapeseed oil, rose water extract, Flax seed gel and vitamins. It mainly focuses on improving scalp health and prevents hair damage and controlling it. The evaluation process of hair serum involves various test like physical appearance (color, smell and texture), pH (similar to that of the skin pH), Homogeneity test, Spreadability and viscosity. These parameters helps in ensuring that the hair serum is effective, safe and provides desired benefits for hair health.

Key words: Cosemeceutical, Hair serum, strengthening, Scalp health, grapeseed oil.

FORMULATION AND EVALUATION OF D-TOX BIO FOOT STRIPS

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ABSTRACT:

Transdermal drug delivery has emerged as a non-invasive, effective, and patient-centric alternative to traditional method . The feet, abundant in sweat glands and capillary networks, serve as an ideal location for sudorific detoxification and the absorption of beneficial substances. Foot strips signify a notable progression in the realm of transdermal delivery and detoxification. These strips are specifically designed to address a range of health issues, such as diabetic foot ulcers, arthritis, sleep disturbances, corns, warts, and athlete's foot, while also offering anti-inflammatory and antifungal properties through specialized formulations. This cutting-edge transdermal foot strip incorporates herbal ingredients and active compounds to deliver targeted benefits, improved systemic circulation, and skin nourishment. The objective is to capture a significant share of the market by employing five distinct strategies, providing therapeutic benefits with minimal or no side effects, utilizing principles of Ayurvedic foot reflexology, ensuring environmental sustainability and biodegradability, and delivering cost-effective options. The transdermal market is experiencing rapid growth, driven by an increasing demand for wellness and alternative healthcare solutions. Countries such as Japan, South Korea, and the United States have already adopted detox foot patches, highlighting substantial market potential. As consumer interest in holistic health continues to rise, this innovation is poised to appeal to health-conscious populations globally. Future advancements may involve the development of personalized foot strips tailored to individual health requirements, incorporating AI-driven diagnostics for customized treatment plans.

Keywords: Transdermal drug delivery, Foot strips, Sudorific detoxification, Herbal ingredients, Ayurvedic foot reflexology, Environmental sustainability.

HERBAL LIQUID MOSQUITO REPELLENT FORMULATION USING *VITEX TRIFOLIA* AND ESSENTIAL OILS: A NATURAL APPROACH TO VECTOR CONTROL

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ABSTRACT

Diseases spread by mosquitoes are a serious risk to the health of the public, necessitating the development of effective and natural repellents. This study focuses on formulating a herbal liquid mosquito repellent incorporating *Vitex trifolia* essential oil along with other plant-derived essential oils. *V. trifolia*, a member of the Verbenaceae family, is known for its bioactive properties, including mosquito-repellent effects attributed to its primary constituent, cis-ocimene. Essential oils were extracted through steam distillation and analyzed using chromatographic techniques to determine their chemical composition. The formulation process involved optimizing essential oil concentrations to enhance repellent efficacy while ensuring safety. The herbal liquid repellent was evaluated for its effectiveness against the most significant transmission of the dengue, chikungunya, and zika viruses, *Aedes aegypti*. Preliminary results indicate that the formulation provides prolonged protection, offering a natural alternative to synthetic repellents. The findings support the potential of *Vitex trifolia* and synergistic essential oils in developing eco-friendly, non-toxic mosquito repellents for public health applications.

Keywords: *Vitex trifolia*, mosquito repellent, essential oils, *Aedes aegypti*, herbal formulation, cis-ocimene, natural repellent, eco-friendly, steam distillation

WOUND HEALING EFFECT OF AN HERBAL SPRAY BANDAGE

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ABSTRACT

Plant-based traditional medicine continues to be vital for healthcare, with India boasting several systems such as Ayurveda and Unani that primarily use plant-derived remedies. *Sida acuta*, commonly known as common wireweed and belonging to the Malvaceae family, aids wound healing by reducing inflammation, boosting collagen production, and offering antimicrobial, antioxidant, and tissue-regenerative benefits. Its bioactive components expedite wound contraction and skin cell formation, thus helping prevent infections and oxidative damage. Similarly, *Tridax procumbens*—often referred to as "coat buttons"—has long been used to enhance wound healing. Extracts of *T. procumbens* demonstrate significant antimicrobial properties and facilitate quicker skin recovery due to bioactive compounds like flavonoids, saponins, and tannins, which contribute to its anti-inflammatory, antioxidant, and healing effects. This invention focuses on developing and characterizing a herbal spray bandage formulated with *Sida acuta* and *Tridax procumbens*. The proposed transdermal spray aims to be more comfortable and easier to apply than traditional bandages while reducing the risk of contamination, ultimately delivering enhanced antimicrobial and anti-inflammatory effects for improved wound healing.

Keywords: Transdermal spray, wound healing , *T. procumbens*, *Sida acuta*.

ULTRACLEAR ACNE GEL: PRECISION TREATMENT FOR CLEARER, HEALTHIER SKIN

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ABSTRACT:

Acne is a common dermatological issue caused by excess sebum production, clogged pores, bacterial growth, and inflammation. While conventional treatments can be effective, they often lead to dryness, irritation, and resistance due to harsh ingredients. UltraClear Anti-Acne Gel is a next-generation, lightweight, and fast-absorbing formulation designed to provide targeted acne treatment without compromising skin hydration and barrier function. This innovative gel incorporates nano-encapsulated actives such as salicylic acid and niacinamide for enhanced penetration and sustained release, ensuring long-term efficacy. Additionally, probiotics and prebiotics support the skin's microbiome, while a blend of botanical extracts—including tea tree, licorice, Centella Asiatica, and green tea—helps to soothe inflammation, control oil, and promote healing. Hydration boosters like hyaluronic acid and polyglutamic acid maintain moisture balance without clogging pores. The formulation undergoes rigorous stability, efficacy, and consumer testing to ensure optimal performance. Clinically tested and dermatologist-approved, UltraClear Anti-Acne Gel represents a breakthrough in acne care, offering a gentle yet effective solution for all skin types.

KEYWORDS: BioLift Eye, Wrinkle Gel, Argireline, copper peptides

BHR ORGANIC LIP BALM

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ABSTRACT:

This project develop an organic lip balm using beetroot, rose, and hibiscus extracts, providing a natural, chemical-free, and nourishing solution for dry, chapped lips. The unique blend of antioxidants and emollients offers long-lasting moisturization, protection, and a subtle, natural color. This eco-friendly lip balm promotes healthy, soft lips while embracing sustainable and environmentally responsible practices. Lip balm preparation beeswax pellets, coconut oil, almond oil, hibiscus powder all above this substance 1spoon and small amount of hibiscus powder mix the all compound finally lib balm will be produced. Alternative use of lip balm You can also use a beetroot and honey mixture for a natural lip tint and balm. To make a beetroot, hibiscus, and rose lip balm, melt beeswax and coconut oil, then stir in beetroot and hibiscus powder, rose petals, and vitamin E oil used to lip balm.

Keyword: Lip balm, Natural lip balm, Antioxidant, Hibiscus, Beetroot

**AGIRGENIX : A BIOINFORMATICS -POWERED MOBILE
APPLICATION FOR CROP IMPROVEMENT**

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ABSTRACT

Crop improvement is essential for ensuring global food security and sustainable agriculture. With advancements in bioinformatics and mobile technology, integrating computational tools into an application can enhance precision breeding and crop trait analysis. This project focuses on developing Agirgenix, a mobile application that utilizes bioinformatics tools to analyse genetic data, predict recommendations for crop enhancement. The app integrates a genomic database, molecular docking simulations and machine learning algorithms to optimize yield, disease resistance, and stress tolerance. By leveraging bioinformatics, this project aims to support farmers, researchers, and agricultural scientists in making data-driven decisions for better crop management and genetic management.

Keywords: Bioinformatics, Mobile Application, Precision Agriculture, Genomic Analysis, Machine Learning.

**COMPUTATIONAL ANALYSIS AND MOLECULAR DOCKING OF
BIOACTIVE COMPOUNDS FROM *STROBILANTHES GLUTINOSUS*
AGAINST BREAST CANCER TARGETS**

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ABSTRACT:

Strobilanthes glutinosus is a medicinal plant with diverse bioactive compounds that remain underexplored for cancer therapeutics. This study employs an *insilico* approach to evaluate the drug-like potential of phytochemicals from *S. glutinosus* against estrogen (ER) and progesterone (PR) receptors, key targets in hormone-dependent breast cancer. A total of 20 phytochemicals were retrieved, of which 15 met drug-likeness criteria based on Lipinski's Rule of Five. Toxicity predictions using the Protox 3.0 tool enabled the elimination of potentially harmful compounds. Molecular docking studies using AutoDock Vina assessed the binding affinity of these 15 compounds to ER and PR. Among them, 9,12- Octadecadienoic Acid exhibited the best binding energy (-6.4 kcal/mol), suggesting a strong interaction with the target receptors. These findings indicate that 9,12-Octadecadienoic Acid could be repurposed as a potential anti-cancer agent, warranting further experimental validation. This study underscores the potential of *S. glutinosus* as a source of novel bioactive compounds for breast cancer therapy, providing a foundation for future drug development.

Keywords: *Strobilanthes glutinosus*, Molecular Docking, Breast Cancer, Estrogen Receptor, Progesterone Receptor, Drug Discovery

AUTOMATING PROTEIN DATA RETRIEVAL USING SELENIUM WEBDRIVER

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ABSTRACT:

For extensive bioinformatics research, it is essential to automate the retrieval of protein data from online databases. The goal of this project is to create a Python-based automation system that uses Selenium WebDriver to retrieve data about proteins from online repositories. The automation script retrieves crucial protein information, including sequences, structural details, and functional annotations, while navigating through pre-defined web pages and interacting with dynamic content. The system effectively gathers and processes data by utilizing Selenium's web element handling capabilities, which minimizes manual labor and enhances reproducibility. The project's goal is to make it easier to acquire high-throughput protein data for applications in bioinformatics and computational biology.

Keywords: Protein Data Retrieval, Selenium WebDriver, Breast Cancer, Web Automation, Bioinformatics, Data Extraction

UNRAVELLING THE ANTIOXIDANT ACTIVITY OF KOJIC ACID SYNTHESIZED BY *ASPERGILLUS FLAVUS*

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ABSTRACT:

In this study, we aimed to isolate and screen fungi that produced kojic acid and to examine its antioxidant activity. Biosynthesized mostly by some fungi, Kojic acid is a multipurpose biometabolite that can be used in cosmetics, medicines, insecticides, pesticides, chemical, and food industries. Five fungal isolates were obtained and screened using an optimized selective medium for the production of Kojic acid from the five soil samples that were collected from the Kodangaiyur garbage dumping yard. Isolates KF1, KF2, KF3, KF4, and KF5 were identified microscopically using the coverslip technique. Out of the screened isolates, the *Aspergillus flavus* strain KF5 showed optimum production capabilities, while maximum yield was assessed with varying factors carbon source, nitrogen source, pH and incubation time produced metabolites were molecularly characterised through ITS sequencing and quantitatively examined by spectroscopic technique. Massive quantities of kojic acid are produced utilizing ethyl acetate in the purification process via crystallization. The antioxidant potential of the isolated kojic acid was assessed using the DPPH (2,2- diphenyl-1-picrylhydrazyl) radical scavenging assay. The results demonstrated a concentration-dependent antioxidant activity, indicating the ability of kojic acid to scavenge free radicals. This suggests potential applications for kojic acid in preventing oxidative stress- related disorders. Results demonstrate the feasibility of waste environments for the bioproduction of kojic acid. Due to a significant increase in demand for kojic acid, the study opens further avenues in metabolic pathway exploration and yield enhancement strategies.

Keywords: Kojic Acid, *Aspergillus*, antioxidant, bioproduction, metabolites, DPPH assay, Sequencing

**EVALUATION OF PHYTOCHEMICAL, ANTI -BACTERIAL, ANTI-
INFLAMMATORY PROPERTIES OF ACALYPHA INDICA LINN LEAF
EXTRACT AND DEVELOPMENT OF PRODUCT**

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ABSTRACT:

Acalypha indica Linn , commonly known as Indian nettle or Indian copperleaf, belongs to the family Euphorbiaceae. In Tamil, it is known as Kuppaimeni. *Acalypha indica* is a medicinal plant known for its diverse pharmacological properties. Which is used as a traditional medicine for various therapeutic uses. This study evaluates the phytochemical composition of *Acalypha indica* Linn leaf extract, which has bioactive compounds like flavonoids, alkaloids, tannins, saponins, and phenolic compounds. This extract is efficient against bacterial pathogens. This shows anti-bacterial activities assessed using the agar well diffusion method, and additionally, anti-inflammatory activity is done using the RBC membrane assay, which shows potential activity. These findings aim to provide skincare benefits such as hydration, hyperpigmentation, antibacterial protection, and soothing effects. Based on these bioactivities, a herbal moisturizer incorporating *Acalypha indica* Linn leaf extract is developed for therapeutic benefits.

Keywords: *Acalypha indica*, Phytochemicals, Antibacterial, Anti-Inflammatory, Herbal Moisturizer, Natural skin care, Medicinal plant

LOTUS STEM PRODUCTS

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ABSTRACT:

Nelumbo nucifera is the scientific name of lotus. It belongs to the family of Nelumbonaceae. The lotus stem has a unique texture that is crunchy and slightly fibrous and a mild sweet flavour. The lotus stem is a good source of fibre, vitamins, minerals and low in calories. It is also known as lotus root. We are developing plant-based products. The lotus stem is grinded to extract the fibres to a paper like consistency. Then these sheets are moulded and formed into various accessible products such as lamp (Diya), bowls, paper booklets and even threads are made. These products stand out as Eco-friendly materials. As lotus stem has been a consumable product and even as a medicinal product since decades, these stems have Anti-Diabetic, Anti-Inflammatory and many helpful medicinal properties for the human kind. So when these lamps are burnt in home the smoke that is released from the lamp would be a natural infuser of medicinal air which is good for respiration and doesn't cause any harm.

Keywords: *Nelumbo nucifera*, Anti-Inflammatory, Anti-Diabetic, Eco-friendly, Plant Based Products.

ECO-FRIENDLY FARMING: AQUAPONICS AN BIOFERTILIZER FOR A GREENER FUTURE

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ABSTRACT:

Aquaponics is a sustainable agricultural system that integrates aquaculture (raising fish) with hydroponics (growing plants in water) to create a self-sustaining ecosystem. This project focuses on constructing an aquaponics system, culturing beneficial microorganisms, and converting fish waste into organic fertilizers. In this closed-loop system, fish waste serves as a nutrient source for plants, while plants help purify and recycle the water, reducing overall consumption. The study involves designing an aquaponics setup with a circulatory water system suitable for both small- and large-scale applications. Selected fish species, such as tilapia, and plants, including microgreens, are cultivated. Microorganisms, particularly nitrifying bacteria (*Nitrosomonas* and *Nitrobacter*), fungi, and protozoa, are isolated from fish tanks and grow beds. These microbes play a critical role in breaking down ammonia from fish waste into plant- available nitrates. For waste bioconversion, composting, vermicomposting, and anaerobic digestion methods are employed to convert fish waste into organic fertilizers rich in nitrogen, phosphorus, and potassium. These fertilizers are tested for their effectiveness in enhancing plant growth both in aquaponics and conventional farming. The project delivers an optimized aquaponics system with sustainable fertilizer production, efficient water usage, and increased yields from fish farming and organic crops. By integrating microbial research with eco-friendly agricultural practices, this study promotes resource-efficient food production, organic farming, and environmental sustainability. The findings contribute to advancing aquaponics as a viable solution for sustainable agriculture and waste management.

Keywords: Aquaponics, Microorganism Isolation, Waste Bioconversion, Organic fertilizers and Sustainable Agriculture

BIOELECTRIC CANCER DETECTION USING MFCS

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ABSTRACT:

Cancer remains one of the leading causes of mortality worldwide, with early detection being crucial for effective treatment and improved survival rates. Traditional detection methods, such as biopsies and imaging techniques, are often invasive, time-consuming, and expensive. This project explores an innovative approach using Microbial Fuel Cells (MFCs) for cancer detection, leveraging the metabolic changes in cancerous cells to generate bioelectric signals. MFCs operate by utilizing bacteria that interact with cancerous biomarkers, producing an electrical current that can be measured and analysed. This system integrates a biosensor with an MFC setup, where microbial activity is monitored in response to cancer-related metabolic by products (lactic acid). By offering a non-invasive, cost-effective, and rapid diagnostic tool, this project aims to contribute to the advancement of early cancer detection technologies, improving accessibility and efficiency in medical diagnostics.

Keywords: Microbial Fuel Cell, Cancer Detection, Biosensors, Bioelectric Signals, Early Diagnosis.

MANILKARA ZAPOTA (SAPOTA) MILK SAP BASED CHEWING GUM FOR GINGIVITIS

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ABSTRACT:

Manilkara zapota is a tropical fruit that has various medicinal properties. In this study, we used sapota latex, which is produced by a sapota tree, as a natural chewing gum base, and we used extracts of *Zingiber officinale* (ginger), *Syzygium aromaticum* (clove), and Piper betel (betel leaf), which have various bioactive compounds. This abstract evidently shows the effectiveness of chewing gum, particularly against gingivitis. Many people around the world lack oral health, which leads to severe health issues like mouth ulcers, gingivitis, periodontitis, and inflammation. So this project aims to bring a proper solution for all your oral health. The antimicrobial, anti-plaque activities of the plants reduce the formation of harmful and disease-causing bacteria inside the mouth. Among one-third of the youngsters, chewing gum is consumed to reduce stress but unknowingly increases the threat to health. This mouth deodorant will act as the alternative and prevent all the oral disorders. We studied this against antibacterial activity, which has the potential to cure it. By this we developed a mouth gum, which has a sapota sap base and is infused with these extracts for oral benefits, especially for GINGIVITIS.

Keywords: *Manilkara zapota*, antibacterial, Anti-Inflammatory, milky latex, ginger, betel leaf, clove extract, chewing gum, Gingivitis

ECO-FRIENDLY SYNTHESIS OF NiO/ZnO NANOCOMPOSITES USING *VITEX NEGUNDO* LEAF EXTRACT FOR MULTIFUNCTIONAL APPLICATIONS

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ABSTRACT:

The eco-friendly synthesis of Nickel Oxide/Zinc Oxide (NiO/ZnO) nanocomposites using *Vitex negundo* leaf extract offers a sustainable and green approach to developing nanomaterials for biomedical applications. Three different composition ratios were synthesized: F1 (equal proportion of NiO and ZnO), F2 (high zinc, low nickel), and F3 (high nickel, low). XRD analysis confirmed excellent crystallinity, with ZnO particle sizes of 14.35 nm (F1), 15.91 nm (F2), and 22.97 nm (F3), while NiO sizes ranged from 14.11 nm to 15.75 nm. UV-Vis spectroscopy revealed bandgap energies of 2.7 eV (F1), 2.75 eV (F2), and 2.55 eV (F3), highlighting compositional effects. SEM analysis demonstrated sheets morphology with minimal agglomeration, and EDX confirmed elemental composition. The F1 ratio exhibited superior antibacterial performance, showing a 1.5 mm inhibition zone against *Staphylococcus aureus* and *Pseudomonas aeruginosa*. The photocatalytic degradation efficiency of green-synthesized NiO/ZnO nanocomposites using *Vitex negundo* leaf extract was evaluated by monitoring the degradation of methylene blue under sunlight irradiation. This study highlights the successful synthesis of NiO/ZnO nanocomposites, particularly F1, with significant antibacterial and photocatalytic activity emphasizing the role of eco-friendly methods in advancing eco-friendly research

KEY WORDS: Green Synthesis, Nanocomposites, Physical characterization and biological applications.

EDIBLE MATERIAL FOR THE REPLACEMENT OF PLASTICS AND IT'S APPLICATION

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ABSTRACT:

The increasing environmental crisis associated with plastic waste has intensified the search for cost-effective, biodegradable alternatives. Edible materials, such as eco-friendly lipsticks, straws, and wrappers, present an innovative solution to reducing plastic dependency. Derived from natural, food-grade, biodegradable polymers like starch, gelatin, and seaweed, these materials are not only safe for human consumption but also decompose naturally, minimizing environmental impact. Unlike conventional plastics, these environmentally friendly alternatives help in reducing pollution and promote waste-free solutions.

Edible lipsticks, formulated with organic ingredients, eliminate the risks of microplastic contamination while nourishing the lips. Edible straws, made from materials such as rice and tapioca starch, serve as functional and fully consumable replacements for single-use plastic straws. Similarly, edible wrappers, composed of rice starch, gelatin and glycerol, offer a sustainable, cost-effective food packaging solution, reducing plastic contamination and supporting zero-waste initiatives. The adoption of biodegradable, eco-friendly materials aligns with global sustainability goals by encouraging environmentally friendly production and circular economy principles. While challenges such as production scalability and affordability remain, continuous research is focused on enhancing material properties, durability, and shelf life. With advancements in edible bioplastics, these innovations hold significant potential for reducing plastic pollution and transforming industries toward a more sustainable future.

KEYWORDS: Edible materials, Biodegradable alternatives, sustainable innovation, eco-friendly products, waste reduction, Cost effective.

AN AIE BASED FLUORESCENT PROBE FOR DIGITAL LIFTING OF LATENT FINGERPRINT MARKS DOWN TO MINUTIAE LEVEL

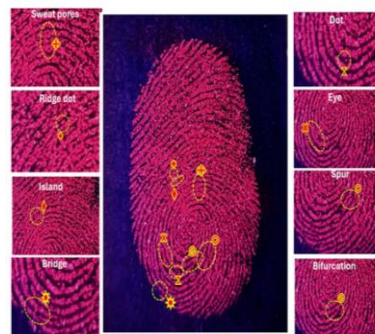
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ABSTRACT:

Forensic analysis plays a crucial role in crime scene investigation, evidence preservation, and criminal identification. The ability to detect and analyze latent fingerprints is essential for linking suspects to crime scenes. In this study, we present a highly efficient Aggregation-Induced Emission (AIE)-based fluorescent probe for forensic applications. A novel pyrene-naphthalene Schiff base was synthesized through a condensation reaction between 2-hydroxy-1-naphthaldehyde and 1-aminopyrene in ethanol. This probe exhibits strong fluorescence under UV light, enabling the digital lifting of latent fingerprints on both porous and non-porous surfaces with high precision. The hydrophobic interactions between the Schiff base and fingerprint residues enhance visibility without surface contamination, ensuring non-destructive forensic analysis. A smartphone-integrated approach further facilitates real-time forensic investigations by capturing and digitally enhancing UV-illuminated evidence. This rapid, cost-effective, and field-deployable forensic technology offers significant advantages over traditional methods, aiding in criminal identification, event reconstruction, and legal proceedings. The study highlights the importance of advanced forensic tools in enhancing crime-solving efficiency and supporting law enforcement efforts in delivering justice.



Keywords: Smartphone-Based Forensics, UV Fluorescence, Pyrene Schiff Base and Fingerprint Detection.

A MATHEMATICAL APPROACH ON FRACTAL VON-KOCH CURVE IN HILL CIPHER TECHNIQUES

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ABSTRACT:

Cryptography is a method to secure information and communication through the use of codes and it is the practice of secure communication in the presence of third parties, often achieved through the use of mathematical algorithms in terms of encryption and decryption techniques. Message encryption and decryption has always played a vital role in the communication domain. To encode (or) decode a message, a number of techniques have been introduced. Some techniques were used in real-world situations. To be more specific, a lot of graph parameters are used for message encryption and decryption techniques. This proposal is basically a mathematical approach for encrypting and decrypting the messages. This work is used to create a new method for encryption and decryption that utilizes the eccentricities obtained from the cartesian product of the Von-Koch Curve first iteration. This technique exhibits a new way in encryption and decryption by using the eccentricities of the Von-Koch Fractal Curve with the essential properties of self-similarity and 2×2 and 3×3 key symmetric matrices. These key symmetric matrices are introduced. Atlast, this new technique encrypts and decrypts a group of letters like digraph, trigraph based on the key symmetric matrices. In every step of encryption and decryption, key symmetric matrices play a major role to improve this method. If 2×2 key symmetric matrix taken, two plain texts can be encrypted and two cipher texts can be decrypted. If 3×3 key symmetric matrix taken, three plain texts can be encrypted and three cipher texts can be decrypted respectively.

Keywords: Fractal Von-Koch Curve, Eccentricities, Symmetric matrices, Determinant, Multiplicative inverse.

FABRICATION AND CHARACTERIZATION OF NONLINEAR OPTICAL SINGLE CRYSTALS FOR DEVICE APPLICATIONS VIA LOW-TEMPERATURE METHOD

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ABSTRACT:

Nonlinear optics is a field that investigates the interactions of light within a medium where the polarisation density responds nonlinearly to the electric field of light. A high-quality single crystal of Bis(D-Phenylglycinium) sulfate monohydrate was synthesised and grown through the SEST technique using an aqueous solution at ambient temperature. Transparent single crystals obtained from the beaker were subjected to single-crystal XRD, which showed a monoclinic structure with a space group of $P2_1$. FTIR analysis is used to identify the functional groups. The optical characteristics were assessed using UV-visible spectroscopy, which evaluated several optical parameters, including cutoff wavelength, optical bandgap, and refractive indices. Thermogravimetric analysis (TG-DTA) confirmed the material's thermal stability up to 273°C. The laser damage threshold (LDT) analysis indicated a power density of 10.7 GW/cm². Furthermore, the harmonic generation efficiency of the material was tested, revealing that it surpasses that of the standard KDP.

Keywords: Single crystal growth, X-ray diffraction, FT-IR, Optical Studies, Thermal analysis, LDT, Second Harmonic Generation.

SOLAR POWER BASED PORTABLE WATER PURIFICATION

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ABSTRACT:

Access to clean and safe drinking water is a global issue, especially in remote and dry regions. Solar power-based water purification offers a sustainable and energy-efficient solution by utilizing renewable solar energy to remove impurities from water. This project aims to design and develop a solar power-based portable water purification system that can provide clean drinking water. The proposed system imitates the natural water cycle. The water is placed in a trough inside a solar still, which is covered with a transparent glass or a plastic sheet. Solar radiation heats the water, causing it to evaporate while leaving impurities such as salts, heavy metals, and microorganisms behind. The vapor condenses on the inner surface of the cover and is collected as purified water. The system is designed to be portable, compact, and user-friendly, making it ideal for emergency response situations or community-based water treatment.

Keywords: Solar still, Distillation, Renewable energy, Sustainable, Clean drinking water

PREDICTION OF PROFIT AND LOSS IN THE STOCK MARKET USING GRAPH THEORY IN ORACLE

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ABSTRACT:

This project explores the method of graph theory in predicting profit and loss in the stock market using Oracle technologies. Stocks are modeled as nodes, and relationships such as price correlations, trade volume similarities, and sector affiliations are represented as edges in a graph structure. By leveraging graph algorithms such as PageRank, centrality measures, community detection, and shortest path analysis, we identify influential stocks, detect market clusters, and analyze trading patterns. Oracle Graph Studio and Oracle Database are utilized for graph data storage, querying, and visualization, while machine learning techniques enhance predictive accuracy. The integration of graph-based relationships with time-series forecasting provides a network-driven approach to market analysis, improving decision-making for traders and investors. The findings demonstrate that graph analytics in Oracle can uncover hidden market patterns, enabling more informed profit and loss predictions in financial markets. This research explores the application of graph theory and the Louvain Community Detection Algorithm as a novel approach to uncovering hidden stock groupings based on modularity maximization. By constructing a stock correlation network, where nodes represent stocks and edges represent the strength of their correlation, the Louvain algorithm is applied to detect communities of stocks that exhibit similar trading behavior. Additionally, this research explores the advantages of undirected, directed, and hybrid graphs in financial analysis. While undirected graphs capture bidirectional correlations between stocks, directed graphs help identify lead-lag relationships, offering predictive insights into stock movements. The findings indicate that graph-based community detection methods outperform conventional clustering.

Keywords: Oracle technologies, Centrality measures, Louvain Community, Detection, financial analysis, lead-lag relationships.

AN APPLICATION OF BODY MASS INDEX USING IN FUZZY LOGIC

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ABSTRACT

In the world, many of them running towards their destiny in a fast competition. No one cares others is somewhat losing the human kindness nowadays they do not care themselves, which leads to destruction. Being sticky to work and earning money alone is not the solution. In olden days, father of the family will be the earner and mother and grandparents will protect by giving energetic food that helps the whole family to be in the good state of health and also lived long years. But in the modern life shifting the native place for work purpose, both are running for earning and keeping distance to grandparents and there is no support and also keeping assistance in the name of caretaker or nanny for their children and this makes children to be thin or obese. In many houses leaving their children lonely and also keeps the needed items in front of them. when caring is bypassed everything will be upside down there is no doubt in it and the standard of living is also not good. The role of Body Mass Index (BMI) is the standard measure used to find the thin, obesity, healthy weight is defined. In medical diagnosis BMI is empowered as a measurable quantity and the first evaluation to find the patient is normal or abnormal it introduces the performativity as a superior framework for confronting the measure's conceptual limitations. Emphasizing key parallels between BMI and self-related health as measures with high predictive validity, yet unspecified mechanisms of action. BMI as a biomarker and towards a more flexible view of the measure as a holistic appraisal of health.

Keywords: BMI, Measurement, validity, performativity, self-rated health, MATLAB, Python.

GREEN SYNTHESIS, CHARACTERISATION OF NiO NANO PARTICLES OF *LUFFA ACUTANGULA* FOR BIOLOGICAL APPLICATIONS

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ABSTARCT:

In this study investigates the green synthesis and characterization of nickel oxide (NiO) nanoparticles using *Luffa acutangula* (ridge gourd) as a natural biotemplate. The NiO nanoparticles were synthesized through an eco-friendly approach, utilizing the plant extract of *Luffa acutangula* as both the reducing and stabilizing agent. The synthesis process was carried out under mild conditions, ensuring minimal environmental impact. The nanoparticles were characterized using various techniques, including UV-Vis spectroscopy, X-ray diffraction (XRD), scanning electron microscopy (SEM), Fourier transform infrared (FTIR) spectroscopy, and dynamic light scattering (DLS). The synthesized NiO nanoparticles exhibited well-defined crystalline structure, high stability, and uniform distribution. Biological activity studies revealed promising antimicrobial and antioxidant properties, suggesting the potential applications of these NiO nanoparticles in biomedical fields, including drug delivery, wound healing, and as antibacterial agents. Further research is ongoing to explore their full therapeutic potential and optimize their performance for various biological applications.

Keywords: Green synthesis, NiO nanoparticles, *Luffa acutangula*, characterization, UV-Vis spectroscopy, X-ray diffraction (XRD), scanning electron microscopy (SEM)