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On behalf of the organizing committee, we are pleased to announce that the International Conference On Engineering Technology And Innovation is held on October 13-17, 2021 in Istanbul, Turkey (Hybrid Conference). ICETI 2021 provides an ideal academic platform for researchers to present the latest research findings and describe emerging technologies, and directions in Engineering Technology And Innovation. The conference seeks to contribute to presenting novel research results in all aspects of Engineering Technology And Innovation. The conference aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results about all aspects of Engineering Technology And Innovation. It also provides the premier interdisciplinary forum for scientists, engineers, and practitioners to present their latest research results, ideas, developments, and applications in al lareas of Engineering Technology And Innovation. The conference will bring together leading academic scientists, researchers and scholars in the domain of interest from around the world. ICETI 2021 is the oncoming event of the successful conference series focusing on Engineering Technology And Innovation. The International Conference on Engineering Technology and Innovation (ICETI 2021) aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results about all aspects of Engineering Technology and Innovation. It also provides the premier interdisciplinary forum for scientists, engineers, and practitioners to present their latest research results, ideas, developments, and applications in all areas of Engineering Technology and Innovation. The conference will bring together leading academic scientists, researchers and scholars in the domain of interest from around the world. The conference's goals are to provide a scientific forum for all international prestige scholars around the world and enable the interactive exchange of state-of-the-art knowledge. The conference will focus on evidence-based benefits proven in technology and innovation and engineering experiments.

Best regards,

Prof. Dr. Özer ÇINAR

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EVALUATION OF OCCUPATIONAL DISEASES OF MEDICAL IMAGING DEVICES EMPLOYEES IN TERMS OF OCCUPATIONAL HEALTH AND SAFETY

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Abstract:

Ionizing radiation is used for diagnostic and therapeutic purposes in the medical field, for material inspection, energy generation and sterilization in the industrial field. In diagnostic radiography; There is ionizing radiation in medical devices such as conventional digital x-ray, fluoroscopy, computed tomography, bone densitometry, SPECT, PET, and in radiotherapy devices such as brachytherapy, fixed source therapy devices, linear accelerators and proton therapy. The health sector is among the working areas where ionizing radiation, especially various imaging tools, is used, and its employees are also at risk. Radiologists, radiology unit workers, cardiologists, urologists in dentistry and veterinary services, orthopedists and cardiovascular surgeons are also among the groups at risk. It has been shown in many studies that exposure to low levels of ionizing radiation in diagnostic radiological examinations can cause leukemia, thyroid, lung and breast cancer. Radiation workers should be examined before starting work and periodically at least once a year. In addition, blood counts twice a year, eye and skin examinations once a year are required. Employees in these departments should use appropriate personal protective clothing and equipment according to the nature of the job. One of the basic principles of radiation protection is to conduct an examination with the lowest possible dose (as low as reasonably achievable (ALARA)) in order to minimize the risks related to radiation. Distance, obstacle and time form the basis of radiation protection. The examination should not be repeated due to technical errors such as incorrect selection of exposure factors and incorrect position. As the exposure time increases, the amount of x-rays increases at the same rate. The received radiation is inversely proportional to the square of the distance. Lead or concrete barriers form a front for radiation protection. If you do not stand behind the protective barrier, a lead apron must be worn. Classification of radiation fields should be done in hospitals. Controlled and supervised areas should be determined. It is mandatory to have radiation warning signs in controlled areas. Employees in these areas are required to use a personal dosimeter. Dose measurements should be made at appropriate times in rooms with radiation and there should be visual warning systems. Radiation used during diagnosis and treatment procedures should not affect anyone other than the patient. Only authorized personnel should be allowed to enter areas where radiation sources are located. Areas with sources of radiation should be well defined and properly marked by workers.

Keywords: Medical Imaging Devices, Occupational Health And Safety

ENHANCEMENT THE BIOLOGICAL BEHAVIOR OF TITANIUM DENTAL IMPLANTS BY LASER PULSES TREATMENT

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Abstract:

The long-term success of dental implants largely depends on rapid healing with safe integration into the jaw bone. Geometry and surface topography are crucial for the short and long-term success of dental implants. This work aim to enhancing clinical performance of titanium dental implants by laser Pulses treatment to provide bone in a faster and improved osseointegration process. The results show that using different manufacturing processes (machining and powder technology) produced topographical differences. The topographical change observed from powder technology method was more than the machined one. Also Strong titanium oxide layer was observed after laser pulsed resulted in improving surface roughness and topography and it was the method of choice for complex surface geometries providing energy focused on one spot especially in the inside of implant thread. The release of Ti ion rise in first three days and after that released of Ti ions begins to stabilize after laser treatment. Finally the histological view of implant samples after 4weeks of implantation, showed active bone formation in all implant surface which give clear indication of tissue acceptance and the appearance of mature bone was observed after laser treatments at short implantation periods.

Keywords: Dental Implants, Osseointegration, Powder Technology, Laser Pulsed, Histological View.

DISTRIBUTED CONTROL FOR DETECTING AND SUPPRESSING THE EPILEPTIFORM REGIME IN THE POPULATIONS OF HODGKIN-HUXLEY NEURONS

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Abstract:

The artificial neural network (ANN) of the Hodgkin-Huxley (HH) neurons demonstrates the variety of regimes for collective spiking and bursting. Particularly, it can cause an epileptiform behavior originated in the hyper-synchronization of the neuron outcomes.In (Borisenok, Catmabacak, Unal, 2018) we proposed the classical model for driving the collective HH neural bursting. Here we discuss the new type of more effective and robust quantum paradigm-based algorithm for detecting and suppressing the epileptiform regime in the small population of Hodgkin-Huxley neurons. Another novelty is the absence of specially designed control elements imbedded to the ANN for the ictal phase detection. The distributed scheme of feedback applies the control signals to the regular HH neurons and makes them to monitor the collective dynamics and drive themselves out of the epileptiform phase. We cover few alternative approaches for the feedback (gradient feedback, target attractor feedback), and discuss their pros and cons to compare with our classical model of the epileptiform suppression.

Keywords: Feedback Control, Hodgkin-Huxley Neurons, Epileptiform Dynamics

MODELING OPTOGENETIC CONTROL OVER EPILEPTIFORM ACTIVITY

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Abstract:

Last years the genetic engineering methods are applied to excite or inhibit single neurons and their populations via light-sensitive channels with different optical devices. Optogenetics allows neurons to be controlled with millisecond pulses through the light-driven activation or inactivation of the light-gated ion channels such as Channelrhodopsin-2 (ChR2) or pumps such as Halorhodopsin in the axon membrane. To study the optogenetic control we use here the 'four state' model of ChR2 channels (Grossman, et al., 2011) with the stimulation applied to the small-scale depolarizing excitatory population of cortical neurons. We develop an algorithm for the Kolesnikov's target attractor feedback forming an artificially supported attractor in the phase space of the dynamical system locking the trajetories in its neighborhood to drive the collective bursting of the neural population described by the non-dimensional meso-scale model (Krame, et al., 2006). We discuss pros and cons of our model to compare with existing alternative approaches.

Keywords: Optogenetics, Epileptiform Activity, Chr2 Channels, Target Attractor Feedback

APPROACH FOR A SIMPLIFIED MESHING NETWORK AS MONITORING SOLUTION IN FARMING APPLICATIONS

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Abstract:

We will present a systematic approach for transferring complex and demanding information and telecommunication technology (ICT) from industrial to antagonal infrastructure requirements in agriculture. As such technology is typically neither affordable nor applicable for small- and medium-sized agricultural businesses, an inexpensive and reliable solution will be presented to enhance respective farming activities. Methodically, the respective solution was inductively developed under the provision of the Innotainment®-Engineering-Approach by German INNOVATOR_INSTITUT, focusing on airiness and applicability of innovative thoughts and projects. Complementing onside interviews in Cuba with farmers in stressed regions have been conducted. As a result, precision of data will be favored over resolution in this ICT-approach. This seems to be appropriate because of the rather raw case of application and a generally lower meaning of resolution on the field. By that, sophisticated industry proven digital-transformation processes will be adapted spanning various classes of businesses. The obtained solution is designed as a platform, enabling a linked sensor network with a wide measuring field. It provides especially for arable land a scalable measuring network with extendable high-performance but low-power sensing nodes.

Core aspect is a low-latency transmission network of single sensing nodes, that monitor growth- and yield-relevant parameters on agricultural surfaces. Each node is based on a scalable CAN-BUS API, that can be modified for different measuring tasks and environments. The active transmission of signals of each entity will be realized via microcontrollers.

Ultra-low-power technologies, such as LoRa communication devices and an intelligent self-meshing network organization support the respective approach. A distinctive control routine will ensure the long-term applicability of every entity in the field. That means, a dynamic battery management will be employed to control sensing intensity depending on the actual electric potential. With lower power level, the device will prolong its measuring and sending intervals.

Keywords: Smart-Farming, Condition-Based-Monitoring, Cultivating, Measuring, Decision

DESIGN AND PRODUCTION OF A MATERIAL FOR CABLE ROUTE PROTECTIVE LAYER

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Abstract:

The aim of this work is to design and production of a material as cable route protective layer. The traditional materials that are being used in the current cable routes in Turkey are bricks, pumice concrete and concrete blocks. The traditional materials are prone to breaking during transportation, thus up to 20% of the product gets broken while being transported to the field. Furthermore, the weight of concrete blocks and bricks make them expensive to transport. Also, these materials are produced in fixed sizes due to manufacturing processes, making them non-optimal for cable route layer dimensions. We aim to create a lighter, stronger, optimal-size and economic material to be an alternative to the traditional materials. In this scope, a literature review has been done to select the material. After the research, it has been decided to use thermoplastic materials since they are easy to produce, and Polyvinyl Chloride (PVC) has been chosen for its durability, rigidness and lightweight. Moreover, since the selected material must meet the requirements set by government agency Turkish Electricity Distribution Co.'s (TEDAS) regulation named "Electricity Distribution Network Energy Cable Installation(Application) Procedures and Principles", necessary design adjustments had to be made. Properties of the material has been altered by adding different agents to PVC in order to make the required adjustments. PVC processing technique has been chosen as extrusion and a mold has been designed with optimal dimensions for cable routes. After producing the prototype, pressure strength tests have been conducted in order to ensure that the prototype meets the requirements. As the last step, the prototype has been installed on a test site for field tests. In conclusion, an alternative prototype has been designed and produced for cable route protection layers using PVC which reduces costs for such applications.

Keywords: Cable Route Protection, PVC, Thermoplastic, Extrusion, Recycling, Sustainable Material

RISK ANALYSIS ASSESSMENT OF STERILIZATION UNIT WORKERS

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Abstract:

Sterilization: It is the killing of microorganisms (including spores) on inanimate materials. Disinfection: It is the destruction of pathogenic microorganisms on inanimate substances. Bacterial spores are reduced according to the level of disinfection. Decontamination: It is a term used to mean that the healthcare worker does not carry a risk if he or she touches the medical instrument or material by hand without using any protective device.

The classification of medical materials based on their relationship with body tissues was made by Spaulding and according to this classification, medical materials were divided into 3 groups as critical, semi-critical and non-critical. Disinfection of these devices is done in the form of high-level disinfection, medium-level disinfection and low-level disinfection. Types of sterilization; Sterilization by Heat, Sterilization by Filtration, Sterilization by Chemical Substances and Sterilization by Radiation (Irradiation). At these stages, heat sterilization, pressurized steam, sterilization with chemical substances and sterilization with radiation are considered very dangerous in terms of occupational health and safety.

There are acute and chronic effects of chemical substances that sterilization workers encounter. These effects depend on the extent of exposure, the route of exposure and the nature of the chemical. Ethylene oxide, one of the chemicals; It is recognized as a carcinogen by the "Occupational Safety and Health Administration (OSHA)". Uptake is from the lungs and direct skin contact may cause irritation. Very high concentrations may cause vomiting, decreased respiratory volume, muscle weakness, cyanosis, incoordination and pulmonary edema. Glutaraldehyde can be taken into the body by inhalation, skin or oral route. Frequent skin contact may cause allergic eczema and may also affect the central nervous system. Formaldehyde is a potentially carcinogenic substance. In low concentrations, it causes burning and tearing in the eyes and irritation in the upper respiratory tract. In high concentrations it can cause tachycardia and a feeling of pressure in the head, in higher doses it can cause pulmonary edema and death.

In this study- review paper-, the risk factors of sterilization center employees will be determined .

Keywords: Sterilization, Risk Analysis, Sterilization Workers

COMPARING DIFFERENT HYPERELASTIC MATERIAL MODELS FOR STIFFNESS ANALYSIS OF THE BUSHINGS USED IN THE SUSPENSION SYSTEMS

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Abstract:

Bushings, which connected to parts such as wishbone, control arm, and stabilizier link to absorb the loads on them, are one of the important part in vehicle suspension systems in terms of comfort and functionality. The damping ability, which known as stiffness, of the rubber material in the bushings is an important criterion in terms of design. Rubber bushings must have different stiffness values depending on where they are used. For this reason, it is necessary to produce samples for the stiffness value calculation in each bushing and to perform tests with these samples. However performing these tests can cause material, time and labor losses during the design process. In this study, it was studied to determine the stiffness value of the rubber bushings with FEA. Rubber is a hyper-elastic material and due to its structure, different methods such as Mooney-Rivlin, Yeoh, Ogden, Arruda-Boyce, Neo-Hokean are used for FEA modeling. In this study, different material models were analyzed and the material model that gave the closest values to the real results was determined.

Keywords: Rubber Bushings, Fea, Hyper-Elastic, Material Modelling, Suspension System

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