PROCEEDINGS OF
"CONFERENCE ON RECENT ADVANCES IN
BIOMATERIALS DEC 17-18 '10"

HELD AT SAVEETHA SCHOOL OF ENGINEERING, SAVEETHA UNIVERSITY, THANDALAM, CHENNAI-602 105, TAMILNADU, INDIA

SAVEETHA UNIVERSITY
(Established Under Section 3 of UGC Act 1956)

Proceedings of
"Conference on Recent Advances in Biomaterials Dec 17-18 '10"
Held at Saveetha School of Engineering, Saveetha University, Thandalam, Chennai-602 105, Tamilnadu, India

SCOPE OF THE CONFERENCE

"The conference will provide a platform for discussing current advancements and future trends in biomaterials for medical and pharmaceutical applications. Through the synergistic approach of applied chemistry and physics, material science, electronics, mechanical engineering, biochemistry and medicine, this Conference on biomaterials includes how the deeper insight into biological events and its interplay with nanotechnology may support the development of a generation of novel materials, micro-nano-devices and molecular level approaches suited to solve relevant biomedical problems both for therapy and diagnostics. The conference will provide an excellent opportunity to meet and forge collaboration with large number of experts with diverse specializations including engineering, basic sciences, medical and dental professionals, etc. For the research scholars and students, CRAB 2010 will be an eye opener and an excellent opportunity to meet experts from various institutions in India and abroad."

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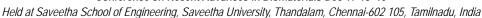
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THEME 6
BIOSENSORS

Abstract id:18
UNMANNED GROUND VEHICLE NAVIGATION

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UGV - Unmanned Ground Vehicle is designed to meet the objectives without the intervention of humans. The conventional methods used proximity sensors and related navigational algorithms to achieve the path planning around the obstacles. We aim for terrain aided landing and navigation of unmanned ground vehicle in unknown environments. In the last several years, more and more efforts have been put in the integration of multiple sensors in robot systems. The goal is to make robots more adaptive and flexible in unstructured or frequency changing environment, and to enable robots to execute intelligent tasks. Multiple source and multiple destinations can be achieved with these features. With the help of terrain sensors landing system is controlled which allows landings in more challenging terrain and provides more flexibility with regard to mission timing & lighting considerations, while maintaining safety as the top priority. An autonomous GNC (guidance, navigation and control) capability is provided for safe landing of the vehicle. This may help the vehicle to navigate in all kinds of terrain. Various techniques to change the type of locomotion from wheel to legs and vice versa, depending on the terrain. Legged robots are well suited to walk on all difficult terrains. This paper develops a robust controller for multi-legged robots that allows it to walk over different terrain in a autonomous way with a limited use of sensory information (vision enabled). The robot is designed to walk by tripod gait or pentapod gait requiring the conditional situation and it switches its locomotion to wheels on even terrains. Normal camera and IR camera is used for clear vision in any kind of environmental conditions. This also increases the stable motion of the vehicle in any challenging environmental conditions.

Keywords: angioplasty, pentapod

Abstract id:19
DEHYDROGENASE BASED REAGENTLESS BIOSENSOR FOR MONITORING PHENYLKETONURIA

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Phenylketonuria (PKU) is a disease characterized by an inability to metabolize the amino acid l-phenylalanine. The resulting buildup leads to brain damage and ultimately mental retardation in children if their phenylalanine intake is not carefully controlled. The National Institutes of Health recently suggested that people with PKU monitor their phenylalanine levels throughout their life and be put on a low phenylalanine diet. As an alternative approach to analysis using blood, this paper describes the first reagentless dehydrogenase based sensor for the determination of

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phenylalanine in human urine. The clinical range of phenylalanine in human urine is 20–60 mM for people with PKU. Although most clinical analysis is performed using blood, urine was chosen due to its high concentrations of phenylalanine in phenylketonurics, as well as its simple, safe, and painless collection. The sensor is comprised of a carbon paste electrode with nicotinamide adenine dinucleotide (NAD+), phenylalanine dehydrogenase (PDH), uricase, and an electron mediator, 3,4-dihydroxybenzaldehyde (3,4-DHB), all mixed into the paste. The electron mediator reacts with the electrode surface to produce two redox species, which catalytically oxidize NADH. The behavior of the electron mediator mixed into a carbon paste electrode has not been previously investigated. Cyclic voltammetry was used to characterize the sensor's response to NADH, and with the addition of PDH and NAD+ to the paste, its response to phenylalanine in human urine. The limit of detection for phenylalanine is 0.5mM(S/N=3).

Keywords: NADH, redox species, voltammetry

Abstract id:39

NANOMATERIALS AND ITS APPLICATIONS

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Nanomaterials are defined as engineered materials with a least one dimension in the range of 1-100nm. Nanotechnology is one of the most developing, expanding and successful branches of science. Nanotechnology has the capacity to improve our ability to prevent, detect, and remove environmental contaminants in air, water, and soil in a cost effective and environmentally friendly manner. Nanoscience and nanotechnologies are revolutionizing our understanding of matter and are likely to have profound implications for all sectors of the economy, including agriculture and food, energy production and efficiency, the automotive industry, cosmetics, medical appliances and drugs, household appliances, computers, and weapons. In this article some of the important and current applications of nanomaterials will be discussed in detail.

Abstract id:74

APPLICATION OF BIOSENSORS IN WARFIGHTER

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War fighter Physiologic Status Monitoring (WPSM) concept is used to monitor soldier physiologic status and provide computer based medical support to increase the likelihood of soldier survival in the battle field. WPSM concept consist of array of biosensors embedded in the soldier's uniform integrated with a data base management system and a decision support system that will provide assistance in casualty prevention and casualty management This paper encloses the advantages and applications of these biosensors in WPSM.

Keywords: WPSM Physiologic Status Monitoring

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Abstract id:122

CLOCK SYNCHRONIZATION IN DISTRIBUTED SYSTEM

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Clock synchronization is a fundamental building block for many distributed applications. In this paper, the problem of realizing a common software clock among a large set of nodes with an internal time reference, any centralized control, and where nodes can join and leave the distributed system at their will. The paper proposes an internal clock synchronization algorithm which combines the gossip-based paradigm with a nature inspired approach, coming from the coupled oscillator's phenomenon, to cope with scale and churn.

The algorithm works on the top of an overlay network and uses a uniform peer sampling service to fulfil each node's local view. Therefore, differently from clock synchronization protocols for small scale and static distributed systems, here, each node synchronizes regularly with only the neighbours in its local view and not with the whole system. An evaluation of the convergence speed and the synchronization error of the coupled-based internal clock synchronization algorithm have been carried out, showing how convergence time and the synchronization error depend on the coupling factor and the local view size. Moreover, the variation of the synchronization error with respect to churn and the impact of a sudden variation of the number of nodes have been analyzed to show the stability of the algorithm. In all these contexts, the algorithm shows nice performance and very good self-organizing properties. Finally, we showed how the assumption on the existence of a uniform peer-sampling service is instrumental for the good behaviour of the algorithm and how, in system models where network delays are unbounded, a mean-based convergence function reaches a lower synchronization error than median-based convergence functions exploiting the number of averaged clock values.

Abstract id:124

OPTIMIZING THE NEXT REVOLUTION

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Like electrivity ,cable, water etc Pay and use facilities optimizing the next revolution the ability to migrate virtual applications from one physical infrastructure to another has radically transformed the way high availability and disaster recovery are implemented.The computing utility is more close to the telephone utility which has evolved from being just voice connectivity to voice, data and video connectivity with the advent of the Internet.The Internet provides the connectivity between IP (Internet Protocol) devices to transfer voice, data or video bits at a certain level of quality assured by the service provider. In the case of computing utility, the service provider must provide the user with access to computing, network and storage resources (CPU, memory, bandwidth, storage capacity, throughput and IO per second) with specified, reliability, availability, performance (including latency) and security constraints.Recent cloud computing offerings from various service providers attempt to provide the computing utility service over the Internet. What distinguishes the cloud computing services from hosted managed computing infrastructure access over the Internet is the cloud's ability to dynamically dial-up and dial down the resources on demand to meet the changing requirements of the services that utilize them. This is made possible by the virtualization technologies that allow abstraction of computing resources such that a single physical machine is able to function as a set of multiple logical Virtual Machines.

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Abstract id: 131

CORRELATION OF COMPUTERIZED SPIROMETRIC RECORDING WITH BLOOD PARAMETER IN ASSESSING COPD.

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PURPOSE OF THE STUDY: Computerized Spirometer is used frequently in detecting various lung diseases. By using this instrument various lung function test can be recorded. One of the lung function parameters, peak expiratory flow rate (PEFR) is very important for assessing the treatment of chronic obstructive lung disease (COPD). **It determines the severity of air flow obstruction and the endurance of respiratory muscles. The leukocyte, the body's defense mechanism, increases with severity of diseases. In the present work, PEFR recording and leukocyte count were compared to assess the severity of COPD patients.** AIM: To correlate PEFR with total leukocyte count(TLC) of COPD patients to assess their severity. METHODOLOGY: Thirty COPD subjects from Medicine Department of Saveetha Hospital participated voluntarily. PEFR was recorded by using Computerized Spirometer (RMS Helios 401, Recorders And Medicare Systems (P) Ltd).The patient was asked to inspire as deeply as they can, and then exhale into the sensor as hard as possible preferably at least for 6 seconds. TLC by usual lab-investigation procedure. STATISTICAL ANALYSIS: Correlation coefficient was calculated between lung function test variable PEFR and TLC. RESULT: The mean values of PEFR & TLC were 215 ± 49.39 and 12, 800 ± 1301.9 respectively. The result showed that there was strong negative significant correlation (-0.80) between PEFR and TLC (p<0.05).CONCLUSION: In the present work, PEFR values were decreased with the severity of COPD whereas the TLC showed an increase with the severity. This inverse relationship may help the family physician to gauze the severity of COPD and send them to the referral centre for early diagnosis and treatment.

Key Words: leukocyte, lung function test, spirometer, PEFR

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