
ABSTRACTS

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Establishing security measures for the protection of production workers through UWB real-time localization technology

(pages 39-43)

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Keywords: real-time technology, protection.

Abstract: This article discusses Sewio's real-time positioning system, which helps organizations protect workers in production areas by improving their safety, reducing the time needed for collection and rescue operations, increasing safety and simplifying the reconciliation of workplace time. The system works on the principle that every employee, supplier or visitor to the production plant receives a tag that identifies their exact location in real time. The tag can be part of a standard visitor card, such as cards issued at conferences. Optionally, the labels can also be attached to the clothing within the worker's arm or possibly to a part of the helmet. This article describes the applications of the use of the RTLS localization system in critical cases of threats to workers' health.

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Testing mesenchymal stem cells on biocompatible 3D scaffold

(pages 45-51)

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Keywords: 3D printing, scaffold, mesenchymal stem cells.

Abstract: The composite, thermoplastic material composed of polyhydroxybutyrate (PHB) and polylactic acid (PLA) was seeded with stem cells in the experiment. Tests of the polymer were oriented towards biocompatibility in vitro using mesenchymal stem cells isolated from the chorion. PHB/PLA is a currently tested biopolymer for applications in and medicine. Using additive technology, 3D forms of scaffolds in the form of a grid were prepared, which were seeded with

stem cells and cultivated in suitable conditions. After an interval of 5 days, the proliferation and viability of the mesenchymal stem cells was tested by the proliferation test. From the results, it was found that the PHB/PLA material was a suitable scaffold and 60-85% stem cell viability was observed. Testing of non-toxic and degradable biopolymers brings new solutions in therapy in clinical orthopedic practice.

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Effect of the auxiliary cathode on the thickness of the HiPIMS TiAlN coating deposited on the inner surface of the tube

(pages 53-57)

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Keywords: TiAlN layer, HiPIMS technique, thickness, adhesion.

Abstract: The paper is focused on influencing the thickness of the TiAlN layer deposited using the high power pulse magnetron sputtering (HiPIMS) method on the inner surface of the tube. The HiPIMS method makes it possible to deposit layers at temperatures up to 400°C. An auxiliary cathode placed in the axis of the coated tube was used. The auxiliary cathode made it possible to deposit an AlTiN layer with a thickness in the center of the coated tube up to 45% higher compared to the thickness of the layer deposited without an auxiliary cathode. The layer thickness was measured to be from 1.5 µm to 2.2 µm for the layer deposited without an auxiliary cathode and 1.05 µm to 1.95 µm for the layer deposited with the wire as the cathode in the axis of the coated tube. Adhesion of the evaluated layers showed the degree of HF2 at the measured thickness points.

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Review on PCB assembly line balancing – glance

(pages 59-71)

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Keywords: assembly line balancing, workstation and PCB manufacturing, precedence constraints and balancing efficiency, algorithm, mathematical model and simulation.

Abstract: The industrial technique known as assembly line balancing is used to increase the efficiency of balancing in production lines. By increasing line efficiency, the assembly line balance problem reduces the number of workstations. The assembly line balancing technique improves line production by utilizing the priority limits for task assignment in the

workstation. By distributing the tasks among the workstations according to priority constraints, assembly line balancing improves the efficiency of the line. Line balance issues are observed to fall under the category of sequence-dependent issues while deciding which part numbers to allocate in the workstation. When choosing which part numbers to allocate in the workstation, line balancing concerns are seen to fall under the category of sequence-dependent issues. Mathematical models, algorithms, and simulation software are just a few of the techniques that have been used in the past to handle assembly line balancing concerns. In order to decrease workstation loads and boost assembly line productivity, an effort has been made to review the PCB manufacturing assembly line balancing problem in the current research study. The goal of the study is to cut down on the workloads and waiting times for each task on a manufacturing line. In order to reduce job waiting times and maximize station workloads, U Type Assembly Line is preferred in this study.

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The mechanism parts of mechanical motion rectifier to produce energy from third pedal in automotive

(pages 73-77)

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Keywords: energy harvesting, break and throttle pedal, mechanical parts, connecting rod, shaft and bearing.

Abstract: Energy harvesting architectures, such as wind turbines and solar panels, have become a necessity as renewable energy sources have grown in popularity. The most promising source of electric energy appears to be electromechanical energy harvesting, as it generates significant amounts of electricity that can be utilized in numerous ways. This research supports and supplements the automotive, regardless of how much and how effectively power is generated. Essentially, when the driver touches the throttle or brake pedal, the energy-harvesting pedal receives motion from them through a mechanical connection rod. Considering its utility in charging electric cars, it is considered one of the most useful sources of electricity.
