Editorial Notes

One of the key elements of the future smart cities is automation and utilisation of robotic system technology. It is believed that not in the far future that home automation, healthcare, telecare, digitised technology and assisted living technology will make a real impact in our quality of life, especially for older adults with long term condition. Older adults to live independently and have a good quality of life is quite a challenge, since the majorly of them have long term health condition diseases. Health services providers across EU and overall the world, informal and formal carer plays major roles in providing the necessary services and support. Diseases on older adults society are one of the leading causes of death, from which thousands of people die every year. Many of the non-communicable diseases can be prevented by tackling associated risk factors. The cost of treatment of such diseases in the EU only is estimated to be over 70% of the Health Service budget. Treatment includes home-care, medication, consultation and many other relevant services. However, these services are still not adequate, due to the lack of implemented automation and robotic systems technology that enable the older adults to manage their daily life activities independently, taking medications, receive the necessary health services on time, which, in many cases leads to loss of lives and waste of NHS resources. Daily life activities management and telehealth remote monitoring system is one of the potential innovative approaches, to improve the older adult's quality of life, help live independently, improve NHS services, sustain its economic growth and improve social development. It is a rapidly developing concept where daily life activities, health condition, medical information is transferred through interactive data, and audio visual media and shared between services provider, informal and formal carer. In this 4th issue and 2nd issues the journal a selection of some of these technological challenges facing the automation industry are presented and some of the inventive researcher pioneering solutions and findings are introduced.

The first paper by *Hafez Fouad and Hesham Farouk (Microelectronics Department, Electronics Research Institute, Cairo, Egypt) presents* Performance Optimization of Healthcare Mobile Applications using Embedded System Design and Implementation. The paper introduces An Embedded device which is an object that contains a special-purpose computing system. The system, which is completely enclosed by the object, may or may not be able to connect to the Internet. Embedded systems have extensive applications in consumer, commercial, automotive, industrial and healthcare markets. Generally, an embedded device's operating system will only run a single application which helps the device to do its job. The heart of electronics system and also coordinator in communication is embedded system managing biometric data from numerous stationary and on body. This simply means that the device's software does not have a user interface (UI). In such cases, an in-circuit emulator (ICE) is temporarily installed between the embedded device and an external computer to debug or update the software. Because embedded systems have limited computing resources and strict power requirements, writing software for embedded devices is very specialized field that requires knowledge of both hardware components and programming. This work describes the design of mobile medical system that can be used to monitor the human temperature and heart beat using a stand-alone microcontroller. The system hardware architecture consists of temperature and heart beat sensors, signal conditioning circuits (SCC), single chip microcontroller, LCD display and GSM modem. An embedded software algorithm acquires temperature, heart beat and pressure, processes, transmits, displays and stores it in the built-in EPROM of the microcontroller.

Yasser Fouad (Alexandria University, Egypt) introduces Classification Process using Hybrid Model of Rough Neural Networks and Gene Expression Programming. The paper presents a new model of rough neural networks based on learning using gene expression programming for classification support. The Objective of gene expression programming rough neural networks approach is to obtain new classified data with minimum error in training and testing process. Starting point of gene expression programming rough neural networks approach is an information system and the output from this approach is a structure of rough neural networks which is including the weights and thresholds.

Saman Fattahi, Islam Shyha, Hamid Baseri (Islamic Azad University, Iran & Northumbria University, UK & Babol University of Technology, Iran) presents Optimisation of dry electrical discharge machining of high speed steel using Grey-relational Analysis. The paper introduces Dry electrical discharge machining (DEDM) is considered as a green format of the conventional oil dielectric EDM where a gas is used as the dielectric medium. This paper details experimental results when DEDM of high speed steel workpieces using multi-response optimisation. Experimental trials were performed to investigate the influence of current, pulse on-time, duty factor, gas pressure and spindle rotational speed on material removal rate (MRR), surface roughness (Ra), and radial over cut (ROC). Grey relational analysis (GRA) based on Taguchi approach was employed for multi-objective optimisation of DEDM responses. Confirmation trials were subsequently conducted and results showed that process responses can be successfully optimised using GRA. Results showed that current, duty factor and air pressure were found to be statistically significant factors at 90% confidence level, with percentage contribution ratios (PCRs) of 72.8%, 4.3%, and 3.7%, respectively. Micro pores and minor surface cracks were visible in the majority of specimens.

The paper by *Komlanvi Moglo, Mahmoud Shafik, Mfortaw Elvis Ashu (College of Engineering and Technology, University of Derby, UK)* is focused on the design and development of a 3D sustainable renewable micro power station for smart grid industrial applications. It demonstrates the need of the supply of clean energy and how its security is becoming a global issue for all countries across the world, due to the limitations of fossil fuels resources usages for energy generations, the relative high dependency on imported fuels, their ever climbing prices and its environmental impacts. Power supply must increase as rapidly as demand to ensure sustained growth. This is the rationale upon which Governments, international organizations, researchers are accelerating investments in expanding the power system, its generation and transmission. This paper presents the preliminary research undertaken to design and develop a 3Dimentional (3D) sustainable renewable micro power station model for smart grid industrial applications. It introduces a solution to challenges in the energy generation sector which do not only refrain only to the safe supply of clean Energy. A major importance for the theoretical study of hybrid systems, based on renewable energy (photovoltaic, wind, hydro system) is the availability of the models that can be utilized to study the performance of hybrid systems and most important, computer aided design simulation tools. As the available tools are quite limited, this paper would present the most current and up to date model which can be used for the simulation purposes of the 3D sustainable renewable micro power station for smart grid applications as well as for educational purposes.

The final paper of this issue is focused on the Quarter Car Railway Vehicle cutting edge technology. *Iqbal M. Ahmed, Md. Yusof Hazlina, M. M. Rashid (International Islamic University Malaysia, Malaysia) presents the Modelling of a Small-Scale Test Rig of Quarter Car Railway Vehicle Suspension System.* The paper focused on the Suspension system which is a mechanism that isolates the vehicle body from road shocks and unwanted vibrations. A basic suspension system usually consists of spring, damper, rods, and ball joints in both automotive and railway transportation. The primary aim of this project is to design and develop a small-scale test rig of quarter car railway vehicle suspension system. This paper describes component selection strategy, technical design procedure, and research investigation of test rig and suspension system. The rig design and motion analysis is conducted by using Solidworks motion study tool where dynamic characteristic of the system, such as, required torque, acceleration and displacement of vehicle body and bogie are investigated based on selected parameters and track inputs.

We hope that you find the issue beneficial and has also given you a good on-site of the ongoing applied research in this fascinating fast-evolving area of innovation and technology.

We look forward to receive your contribution to the future journal issues

Mahmoud Shafik