

Editorial Notes

Mechatronics Engineering covers various aspects of technology, including sensing and measurement, actuation, and control technology. In designing any Mechatronics system, each individual aspect needs to be carefully considered. Furthermore, appropriate integration has to be performed by taking into account all the constraints and various environmental conditions. Advancement in the related technology will lead to advancement in Mechatronics systems. In this issue of IJRM, five Mechatronics systems including robot, electrical systems and unmanned aerial vehicle, and the advancement of the related technology are considered. The first paper by Abdalla, proposes a unipolar electroadhesion pad technology which is cost effective and light in weight for adhesion mechanism of wall climbing robot. The proposed technology showed desirable electrostatic adhesion force on walls with copper, melamine and wood substrates.

In the second paper by Elsaadi and Shafik, an intelligent medical care system for elderly people is proposed. The proposed system is based on ZigBee wireless sensor network technology, and is set as preventative healthcare and pervasive systems for continuous monitoring of the user. The advancement in wireless sensor network technology has benefitted the proposed system by providing low-power consuming instrumentation and has allowed the development of such intelligent system for gathering medical information for elderly people. The proposed system can provide real-time, non-obstructive and long term medical monitoring to the patients. It also allows for remote monitoring of the patients' medical condition through Internet from which the data can be shared with the patients' family, medical doctors and hospital for regularly checks.

Another advanced Mechatronics system is proposed in the third paper, authored by Khorshidtalab, Salami and Akmeliawati. The proposed system is a brain-controlled assistive feeding system for people with upper limb disability due to various reasons, including amyotrophic lateral sclerosis. The proposed robotic system can be controlled by brain signals in real-time to enable the user to eat independently. The system can perform with $83\pm 5\%$ accuracy with a sufficiently fast rate of decision making, one decision per five seconds.

The fourth paper in this issue, authored by Muhida, presents a microcontroller-based inverter circuit for 500 W residential wind generator. The proposed inverter circuit was used with a particular topology of wind energy conversion system to convert the DC voltage to sinusoidal AC voltage for residential use. Microcontroller PIC16F887 is utilized to control the switches in the inverter by controlling the duty cycle of sinusoidal pulse width modulated signal. The experimental result presented in the paper demonstrated that the proposed system has successfully produced single phase 240 V-50Hz sinusoidal AC voltage with 4% total harmonics distortion (THD) across load. The THD is well below the 5% limit recommended by IEEE standard 519-1992.

The final paper of this issue, authored by Subramanya, proposes a simultaneous localization and mapping (SLAM)-based linear optimal control for navigation system of unmanned aerial vehicles with limited sensor resources. The system uses monocular image sequence fed through 1-Point random sample consensus (RANSAC) combined with extended Kalman filter (EKF) to reduce the computational complexity. The proposed system was tested on the Parrot AR.Drone, a quadrotor, which was equipped with two cameras; a front-camera and a down-looking camera, an ultrasound sensor and an inertial measurement unit (IMU). These on-board sensors provide flight data for the EKF to estimate the current pose.

We hope the contributions in this issue are beneficial and provide you with illustrations of various fascinating advancement in Mechatronics-related technology and applications. We look forward to receiving your high quality contributions in IJRM future issues.

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