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## Editorial

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**Biographical notes:** Nitaigour P. Mahalik received Master and PhD degrees in the years 1993 and 1998, respectively. He did Postdoc research in 2002 at Gwangju Institute of Science and Technology, South Korea. He visited Moscow State Technological University, University of Western Australia, McGill University and many others. With more than 90 publications, he has been serving several journals at various capacities. He is the recipient of overseas fellowship and Brain-Korea fellowships. He works in the areas of automation and control. Currently, he is at Jordan College of Agricultural Sciences and Technology in CSU Fresno, USA. He is the member of many professional societies.

Mo Jamshidi (F-IEEE, F-ASME, F-AAAS, F-NYAS, F-TWAS) received the PhD degree in Electrical Engineering from the University of Illinois at Urbana-Champaign in 1971. He holds three honorary doctorate degrees and is Lucher Brown Endowed Chaired Professor at the University of Texas System at San Antonio Campus, Texas, USA and Founding Director of Center for Autonomous Control Engineering (ACE) at the University of New Mexico (UNM). He is the Director of the National Consortium on System of Systems Engineering. He has over 550 technical publications including 58 books and edited volumes. He is the Founding Editor/Co-editor of five journals and one magazine.

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This issue also celebrates third year of successful publication of *IJAAC*. As mentioned in the previous issue, the quarterly publication will continue in this year as well. The V4/N1 of *IJAAC* consists of six papers. The titles are as follows.

- 1 Neural network-based robust  $H^\infty$  decentralised control strategy with new learning algorithm for robot manipulators.
- 2 Reduced order state-space modelling of a two-shaft turbofan engine for control and off-design performance analysis.

- 3 Design and experimental evaluation of simultaneous fast output sampling feedback control for smart structures.
- 4 A comparison of a classical PID and sliding mode: traction control for fast wheeled mobile robot.
- 5 Fault identification and analysis using artificial intelligence techniques for three-tank system.
- 6 Application of artificial intelligence in Fault Detection and Isolation of uncertain parameter systems.

The first paper presents a novel robust  $H^\infty$  decentralised intelligent control strategy for the trajectory control of robot manipulators. The system is comprised of a computed torque controller and neural controller with learning algorithm. The authors have used Lyapunov stability theorem. It is expected that the proposed controller would guarantee stability of the considered closed-loop systems.

The second paper deals with state space-based dynamic modelling of a twin spool turbofan gas turbine engine. The governing equations constituting the dynamic model of the engine are derived by considering one dimensional mass, moment and energy balance equations at intermediate engine stations. The objective of the paper can be considered as a review to system modelling and analysis by the use of algebraic equations and neural networks. Simulation results based on various operating conditions show transient behaviour of the engine system.

The third paper of this issue presents work on design of feedback controller that can minimise structural vibration. In particular, the authors have designed and implemented the simultaneous fast output sampling feedback controller that is capable of suppressing the vibration of three smart cantilever beams with parameter variation introduced in length and mass. A digital control system constituting standard software and hardware tools is used for identification and control.

The fourth paper studies PID and sliding mode control schemes of a mechanical system subjected to rolling contact. Sliding mode controllers are considered to be robust to parametric uncertainties. The objective of this work was to design the controller of a traction control system. The controller is designed to achieve the acceleration performance maintaining the slip ratio of driven wheels low.

Last but not least, the final two papers of this issue present work in the areas of fault detection and isolation (FDI). Last issue had also published a paper on FDI. In that paper, the bond graph modelling that allows unified representation of multi-energy domain of system dynamics was used in order to develop model-based quantitative FDI schemes. The author had considered some issues of fault tolerant control as well as system reconfiguration in the simulation. However, in this issue the first paper in FDI considers a model-based fault diagnosis in a three-tank system using artificial intelligence (AI) techniques such as, back propagation network (BPN), radial basis function network (RBFN) Kohonen network and fuzzy expert system. In the second paper, on the other hand, the bond graph modelled uncertain parameter systems are proposed. Here, a fuzzy approach based on residual processing is proposed for offline detection, and a multi-layer perceptron trained with resilient back propagation algorithm is proposed for online detection. The pioneer works by Isermann, Frank, Moore, Basseville, Patton, Blanke, Gertler, Evans, Henry and many others can be referenced.