Editorial: Research Student Special Issue

It has been my pleasure to have been invited to act as Guest Editor for this Special Issue, the objectives of which were to promote the excellent work that many of our better younger researchers are pursuing, as well as to provide an opportunity to highlight and capture some of the challenging research which will have an impact on the man-made technological environment.

At the outset, it was recognized that all the published papers must first satisfy the rigorous review processes required of any Transactions publication. In addition, it was also recognized that, due to the limited capacity of a single issue, it would be difficult to include a cross-section of topics in the measurement and control area. This Special Issue contains five papers, which arguably go some way to satisfy this goal.

The papers included are briefly outlined as follows:

- **Modelling and control of the flame temperature distribution using probability density function shaping**, by Sun, Yue and Wang, considers the problem of modelling and control of flame temperature, which has applications in industrial boiler systems. The problem becomes one of shaping the flame temperature distribution via predictive control of the flame energy distribution. Results are presented for the two-dimensional case and preliminary consideration is given to the case of three dimensions.

- **Aircraft flight controller tracking design using H-infinity static output feedback**, by Gadewadikar and Lewis, proposes a systematic approach to develop an improved aircraft flight control system based on output feedback design. The design procedure, which is based on H-infinity, is described and the resulting closed-loop performance is evaluated. The results of simulation indicate improved robustness performance over previous designs in the presence of disturbances.

- **Identification of power disturbances using morphological transform**, by Lu, Smith, Wu and Fitch, is concerned with the development of a morphological transform for detecting disturbances or fault conditions on electrical power lines. This is becoming an increasing issue with use of electronic and microprocessor-based electrical loads. The developed approach is shown to be robust and is able to classify different faults in the presence of noise. The approach is also claimed to be straightforward to implement.

- **Classification as an aid tool for the selection of sensors used for fault detection and isolation**, by Orantes, Kempowsky and Le Lann, proposes a methodology to identify the most effective location of sensors to be used for fault detection. The method is based on an entropy concept, which is exploited in order to evaluate a measure of ‘information gain’. The efficacy of the developed approach is demonstrated and an evaluation of its performance is presented when applied to a laboratory based open-plate reactor system.
Real-time measurement of melt viscosity in single-screw extrusion, by McAfee and McNally, is concerned with the real-time measurement of melt viscosity with application to the polymer extrusion process industries. The performances of in-line and side-stream rheometers are examined and the potential for using these instruments in feedback control is considered. It is found that the in-line instrument provides a more satisfactory performance than the side-stream device. Sources of error of the in-line device are highlighted.

Finally, on behalf of the Members of the Editorial Board of Transactions, I would like to take this opportunity to thank the reviewers and authors of all the papers. In particular, we would like to extend our best wishes to the younger members of these teams whose ingenuity and hard work is reflected in these publications.

Keith Burnham
Guest Editor