
Editorial

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Biographical notes: Francesco Longo is an Assistant Professor from the University of Calabria, Italy, Director of the research laboratory Modeling & Simulation Center – Laboratory of Enterprise Solutions (MSC-LES) and CEO of the spin-off company CAL-TEK Srl. He has worked on both public and private research projects involving manufacturing and logistics systems and has published in the field of industrial plants management, modelling and simulation methodologies and applications. He also actively cooperates with many companies and research institutions all over the world, among others DIPTeM, University of Genoa, NASA Kennedy Space Center, NATO CMRE, York University (Canada), and Rutgers University (NJ, USA).

Antonio Padovano is currently working from the University of Calabria. His research interests include the development of interoperable multi-method simulations for decision support and education/training in complex systems in the areas of industry, logistics and defence, with a focus on human modelling. He has participated in various research projects and participated as a speaker at various international conferences. He visited and carried out research activities from the NATO STO CMRE and Rutgers University (NJ, USA). He also actively cooperates with the University of Genoa, NASA Kennedy Space Center and several other research institutions.

Nowadays, innovations and improvements are needed to react quickly to the new trends of the global economy as well as to the financial crises that is acting in many countries. On the contrary, innovations and technological advances that involve multi-disciplinary domains are also needed by developing countries to drive correctly and effectively their growth. In this sense, modelling and simulation (M&S) has a critical and strategic relevance in several areas of business and it is increasingly becoming a central methodology for the design of new systems and technologies (e.g., simulation-based design) as well as for the analysis and improvement of existing systems (e.g., decision making, training, education, etc.).

The special issue on ‘Modelling, simulation and computer software developments in petroleum production and processing industries’ publishes outstanding research papers describing significant developments in computational modelling and simulation that are applicable to scientific and engineering problems in the oil, gas and coal industry, encompassing different areas such as engineering, geosciences, applied mathematics, computer science and risk analysis. The special issue intends to provide a unique resource to professionals, academics, researchers, and managers working in the fields of petroleum oil, or other fossil hydrocarbon type fuels industries, biofuels, businesses and

management from all over the world. All the papers have undergone rigorous peer review and revision process to ensure high-quality scientific relevance and encompasses wide areas of research in the main process industries:

- 1 In the field of oil industries, the special issue proposes four articles:
 - ‘Pressure transient behaviours of vertical wells in low permeability reservoirs with threshold pressure gradient’
 - ‘Effect of different rheological models on prediction of tri-cone bit pressure drop’
 - ‘Simulation, optimisation and analysis of energy saving in crude oil distillation unit’
 - ‘An analytical model for dissolution of deposited asphaltene during CO₂ injection from the porous media’.
- 2 In the field of gas industries, the special issue proposes two articles:
 - ‘Practical shale gas decline analysis in Changning shale gas play – a variable pressure drop study’
 - ‘Selection of decline curve analysis method using the cumulative production incline rate for transient production data obtained from a multi-stage hydraulic fractured horizontal well in unconventional gas fields’.
- 3 In the field of coal industry, the special issue proposes four articles:
 - ‘Investigation on support pattern of a coal mine roadway under dynamic pressure of mining – a case study’
 - ‘Analytical solution of coal self-heating characteristics incorporating the effect of oxygen concentration’
 - ‘Control mechanisms and design for a ‘coal-backfill-gangue’ support system for coal mine gob-side entry retaining’
 - ‘Gob-side entry retaining formed by roof cutting without roadside support’.

The guest editors intend to thank the *IJOGCT* Editor-in-Chief, Prof. M.R. Riazi, the Journal Manager, Janet Marr, and the whole journal staff for their invaluable support in setting up this special issue.