Call for Papers for the Special Session on

Computational Intelligence in Aerospace Sciences and Engineering

IEEE Symposium Series on Computational Intelligence
6-9 December 2016 in Athens, Greece

Important Dates

Paper submissions: 18 Jul 2016

Notification: 12 Sept 2016

Final submission: 10 Oct 2016

Session Organisers

University of Strathclyde
Glasgow, United Kingdom

Prof **Massimiliano Vasile**
Professor in Space Systems Engineering
Director, Aerospace Centre of Excellence
massimiliano.vasile@strath.ac.uk

Dr **Christie Maddock**
Lecturer in Transatmospheric Flight
Centre for Future Air-Space Transportation Technology
christie.maddock@strath.ac.uk

Dr **Annalisa Riccardi**
Lecturer in Computational Intelligence
Centre for Intelligent Computation in Engineering
annalisa.riccardi@strath.ac.uk

Dr **Edmondo Minisci**
Lecturer in Multidisciplinary Design Optimisation
Centre for Intelligent Computation in Engineering
edmondo.minisci@strath.ac.uk

Session Topics

Authors are invited to submit papers topics relating to CI methods or applications in aerospace, including but not limited to:

- Global trajectory optimisation
- Multidisciplinary design for space missions
- Formation/constellation design & control
- Optimal control of aircraft, UAVs, spacecraft or rovers
- Planning and scheduling for autonomous systems in space
- Multi-, many-objective optimisation for space applications
- Resource allocation & programmatics
- Evolutionary computation for concurrent engineering
- Knowledge-based system engineering
- Distributed global optimisation
- Mission planning and control
- Robust mission design under uncertainties
- Decision making strategies for large scale sequential decision problems
- Intelligent search and optimisation methods in aerospace applications
- Guidance, navigation and control for aerospace vehicles
- Autonomous exploration of interplanetary and planetary environments
- Implications of emerging AI fields such as Artificial Life or Swarm Intelligence on aerospace research
- Intelligent algorithms for fault identification, diagnosis and repair of aerospace systems
- Multi-agent systems approach and bio-inspired solutions for system design and control
- Advances in machine learning for aerospace applications
- Intelligent interfaces for human-machine interaction
- Knowledge discovery, data mining and presentation of large data sets
- Data mining and machine learning in astronomy and earth observation

Manuscripts should be prepared according to the format of IEEE papers specified in the conference website and submitted online on the Easychair system.

Scope

In space and aerospace, many applications require the solution of global single or multi-objective optimisation problems, including mixed variables, multi-modal and non-differentiable quantities. In astronomy, telescopes and detectors are advancing generating large volumes of data that need to be analysed. From global trajectory optimisation to multidisciplinary aircraft and spacecraft design, from planning and scheduling for autonomous vehicles to the synthesis of robust controllers for airplanes, unmanned aerial vehicles and satellites, from fault detection in space system to image processing of science or Earth observation missions, computational intelligence techniques have become an important – and in many cases an essential – tool for tackling these kinds of problems, providing useful and often non-intuitive solutions. Not only has work in aerospace applications paved the way for the ubiquitous application of computational intelligence, but moreover, they have also led to the development of new and refined approaches and methods.

This special session collects many diverse efforts made in the application of computational intelligence techniques, and related methods, to aerospace problems. The session focuses on CI techniques applied to systems operating in air and/or space, collecting experts from astronomy, space sciences, mechanical, aerospace and electrical engineering, as well as computer science, mathematics and more diverse disciplines.

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