

# AHS 2018

12th NASA/ESA  
Conference on Adaptive  
Hardware and Systems

The University of Edinburgh  
Edinburgh, UK

August 6 - 9, 2018

Coinciding with the famous  
Edinburgh Festival

We invite you to participate in the 12th edition of the NASA/ESA Conference on Adaptive Hardware and Systems (AHS), to be held at the University of Edinburgh, Edinburgh, United Kingdom.

Adaptation occurs in all living systems and is a desired characteristic of most artificial systems. Adaptation reflects the capability of a system to maintain or improve its performance in the context of internal or external changes, changes in the operational environment, incidental or intentional interference, or trade-offs between performance requirements and available resources.

The conference will bring together multi-disciplinary researchers from academia and industry, and government specialists to communicate the latest research results, share experiences, and discuss new applications. We welcome original contributions in the areas of hardware and software adaptation at different levels, including, but not limited to:

- Adaptation in hardware, for example, as manifested in:
  - Reconfigurable circuits
  - Circuits and structures
  - Prosthetic hardware
  - Wearable devices
  - Fault tolerance and robustness
- Adaptation in biomedical and bio-inspired systems such as:
  - Soft robots
  - Genomics and systems biology
  - New sensors and sensing systems
- Adaptive sensing systems:
  - Reconfigurable/multifunctional sensors/antennae
  - Reliable/Fault-tolerant sensors/antennae
  - Reconfigurable/reliable sensing and RF circuits and systems
- Design methodologies for adaptive systems, e.g., related to:
  - Computer-aided design
  - Performance, cost, power, and reliability strategies
  - Formal methods
- Adaptation Algorithms
  - Learning and evolutionary algorithms for adaptive hardware
  - Search and optimization algorithms for adaptive hardware
  - On-chip learning and adaptation
  - Automatic/self-calibration
  - Hardware implementations of optimization engines
  - Adaptive image and data compression
- Adaptation in robotics and unmanned systems, as reflected in:
  - Sensing and perception
  - Navigation and mapping
  - Human-robot interaction
  - Multi-robot teams
  - Cognitive architectures
  - Tensegrity and compliance Soft robots
- Applications in areas such as:
  - Space systems and missions
  - Autonomous vehicles
  - Social systems, economics, and finance
  - Telecommunications
  - Biotechnology and pharma
  - Assisted living and healthcare
- Artificial Intelligence and Machine Learning
  - Algorithms
  - Big Data
  - Implementations
  - Applications

While the general theme of this conference is on adaptation and space applications, we welcome original contributions in other application areas such as consumer, medical, defence and security, as the techniques employed in these areas can be disseminated across the board. We also welcome papers describing significant applications of adaptive hardware and systems to industrial case studies and demonstrating their capabilities and effectiveness. For further details on topics, please visit the conference website at <http://www.ahs-conf.org>

## IMPORTANT DATES

### Regular Papers:

- Submission: April 13, 2018
- Notification: May 18, 2018

### Tutorials:

- Proposals: Jan 27, 2018
- Notification: Feb 17, 2018

### Workshops:

- Proposals: Feb 24, 2018
- Notification: Mar 10, 2018

### Special Sessions:

- Proposals: Jan 27, 2018
- Notification: Feb 3, 2018

## CONFERENCE CHAIRS

- Tughrul Arslan - University of Edinburgh (General Chair)
  - David Merodio Codinachs - ESA (General Co-chair)
  - Didier Keymeulen - NASA JPL (Technical/Program Co-Chair)
  - Patel Umesh - NASA (Technical/Program Co-Chair)
  - Robért Glein and Florian Rittner - Fraunhofer IIS (Tutorials)
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CONFERENCE  
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