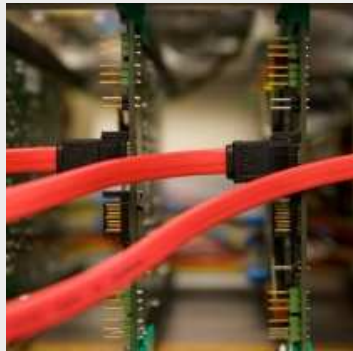




## Special Session Organisers

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## Deadlines

**Paper Submissions**  
1st November 2008

**Notification of Acceptance**  
16th January 2009

**Final Paper Submission**  
16th February 2009



## Submission

Please use the main IEEE CEC 2009 online submission system, indicating the 'Hardware Aspects of Bio-Inspired Architectures and Systems' Session

## Hardware Aspects of Bio-Inspired Architectures and Systems

IEEE CEC 2009 Special Session

Bio-inspired techniques and systems, supported by a wide range of state of the art electronic systems, have the potential for creating novel and competitive real-world applications. Furthermore, this research area offers the possibility to explore and master emerging technologies. However, could the challenge of embedding complex algorithms in hardware or developing proof-of-principle hardware prototypes into complete solutions explain why they have not been more widely adopted?

With the rapid increase in computational power of standard low-cost PCs, it has become easier to develop highly sophisticated algorithms within the field of evolutionary computation. Due to this, most applications are only developed in software relying on large systems utilising great computational power. However, without undertaking a hardware implementation stage, these systems reduce their chances of being deployed in many real-world applications and lose out on the advantages customised hardware platforms can offer: reduced size, energy efficiency, dependability and mobility as well as greater parallelism and hardware acceleration of critical operations. In order to make novel bio-inspired techniques industrially and commercially competitive, these properties are crucial and generally cannot be achieved in software only solutions. In areas such as robotics, mobile computing, automotive industries and real-time data processing these factors become vital.

### How do people see Hardware?

Tool or Tissue?

Used or Abused?

Explored or Exploited?

This session is intended to bring together researchers who are implementing bio-inspired techniques in hardware, who are addressing the challenges this process presents and who are pushing forward alternative technologies for bio-inspired investigations. This session will provide a great opportunity for researchers to discuss their approaches and exchange their expertise and solutions. Submitted papers should be based upon, but not restricted to, the following topics:

### Enhancing Electronic Systems and Advancing Technology with Bio-Inspired Techniques

- Adaptive and homeostatic architectures
- Developmental systems
- Reconfigurability and fault tolerance
- Evolution of electronic circuits

### Hardwarisation of Bio-Inspired Techniques

- Encoding complex hardware architectures (configurations, state)
- Algorithm acceleration (Parallelism, custom IP)
- Resource limited data representation in hardware (sensor data, population management)
- Dynamic routing techniques
- State management within runtime reconfigurable architectures

### Alternative technologies for Bio-Inspired Investigations

- Novel/Unconventional reconfigurable fabrics
- Exploiting consumer devices
- Natural substrates