IEEE/RSJ International Conference on Intelligent Robots and Systems

iROS
Hamburg 2015

IROS 2015 workshop on
Unconventional computing for Bayesian inference
BAMBI
Bottom-up Approaches to Machines dedicated to Bayesian Inference

Workshop on
Unconventional computing for Bayesian inference

<u>September 28, 2015 at IROS 2015</u>

The workshop is part of the 2015 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2015) that will be held in Hamburg, Germany, during September 28 – October 03, 2015

This workshop will address unconventional computing for Bayesian inference, with keynote speakers on Bayesian inference for autonomous robots, and insights form computational biology, as well as presentations of submitted works, aiming to encourage these Bayesian and unconventional computing approaches to the IROS community.

:: Abstract

Contemporary robots and other cognitive artifacts are not available to autonomously operate in complex environments. The major reason for this failure is the lack of cognitive systems able to efficiently deal with uncertainty when behaving in real world situations.

One of the challenges of robotics is endowing devices with adequate computational power to dwell in uncertainty and decide with incomplete data, with limited resources and power, as we and biological beings have done for a long time.

To deal with incompleteness and uncertainty probabilistic Bayesian approaches have been pursued, with outstanding results. However, all these works, even if they propose probabilistic models, still rely on a classical computing paradigm that imposes a bottleneck on the performance and scalability. Improved and novel electronic devices have opened the spectrum of devices available for computation, such as GPUs, FPGAs, hybrid systems, allowing unconventional approaches to better explore parallelization and tackle power consumption. The flexibility of current reprogrammable logic devices provides a test bed for novel stochastic processors and unconventional computing.

The workshop will address recent advances and future directions of probabilistic computing for robotics, with keynote speakers on Bayesian inference for autonomous robots, and insights form computational biology, as well as presentations of submitted works, setting the floor for fruitful discussions and insights in this bridge topic.

:: Invited Speakers

- Jacques Droulez, "Bayesian computing in biology"
- Pierre Bessière, "Bayesian Programming for Robotics"
- João Filipe Ferreira, "Probabilistic Approaches for Robotic Perception"
- Jorge Dias, "Probabilistic Approaches for Robotic Perception"

:: Submissions

The workshop on unconventional computing for Bayesian inference invites submissions of full papers or extended abstracts for poster presentation. Topics include, but are not strictly limited to:

- Low power computing solutions for Bayesian inference
- Parallel architectures and unconventional computing for Bayesian inference
- Stochastic computing for Bayesian inference
- Autonomous robots performing Bayesian inference with limited resources
- Insights from computational biology for Bayesian computing
- Bayesian programming for robotics
- Bayesian models for robotic perception and cognition

Submission should follow the conference format , 6 page for the full papers and 2 page for extended abstracts, and submitted via easychair https://easychair.org/conferences/?conf=ucbi2015. For any help or further details please contact jlobo@isr.uc.pt.

:: Important dates

Submission deadline: July 6
Notification of acceptance: July 31
Camera ready submission: September 1
Workshop day: September 28

For further details please visit the website:
http://ap.isr.uc.pt/events/UCBI_iros2015/

:: Organisers

Jorge Lobo, ISR - University of Coimbra   (jlobo@isr.uc.pt)
João Filipe Ferreira, ISR - University of Coimbra