

CALL FOR CONTRIBUTIONS - IROS WORKSHOP

Probabilistic Graphical Models in Robotics

Taipei, Taiwan
October 22, 2010

<http://www.graphbot2010.ethz.ch>

Important Dates

- Submission of extended abstracts: **Jul 12, 2010**
- Notification of acceptance: **Aug 10, 2010**
- Final submission: **Seg 13, 2010**
- Workshop date: **Oct 22, 2010**

Overview

Among the large family of machine learning techniques, the concept of probabilistic graphical models has gained significant interest in robotics, as it offers a good combination of graph-theoretic design and probabilistic reasoning together with a solid mathematical background.

Due to their versatility, graphical models have become more and more attractive for robotics applications where probabilities are used to describe uncertainty about sensors and actions. In particular, graphical models such as Bayes nets, Markov random fields and factor graphs, have been proven to be very powerful tools in the area of robotic perception, scene analysis, and simultaneous localization and mapping (SLAM).

The objective of this workshop is to collect, discuss, and analyze in detail recent approaches based on graphical models for typical robotics problems. Additionally, the workshop aims at bringing together researchers that are either interested or already working in this field, to talk about the successes, limitations, and open problems in the use of graphical models in robotics.

Invited Speakers

Wolfram Burgard, Univ. of Freiburg
Frank Dellaert, Georgia Tech
Michael Kaess, MIT
Kristian Kersting, Univ. of Bonn
Kurt Konolige, Willow Garage
Edwin Olson, Univ. of Michigan
Fabio Ramos, ACFR
Gian Diego Tipald, Univ. of Freiburg

Submissions

We invite contributions in areas that are relevant in robotics such as classification and state estimation. Both theoretical and applied papers are encouraged. The common theme is probabilistic graphical models within robotics that includes papers spanning one or more of the following threads:

- types of graphical models (e.g. Bayesian Networks, Factor Graphs, Markov Random Fields, Conditional Random Fields, Associative Markov Networks etc.)
- inference algorithms (belief propagation, Junction Tree, MCMC etc.)
- training algorithms ((un-)constrained optimization, approximations etc.)
- network topology design (heuristics, theoretical motivations)
- combination with other techniques (e.g. smoothed classification)
- graphical models and sparse linear algebra
- application scenarios (classification, state estimation, etc.)
- comparison of methods, benchmarking
- implementation issues

Submission Procedure

Participants are invited to submit an extended abstract of maximum 3 pages using IEEE format. The page limit for the final paper is 6 pages. The authors of selected contributions will have the opportunity to present their work during the workshop either as a regular presentation or as a poster along with a short spotlight presentation.

In case of a sufficient number of high quality submissions, extended versions of the selected contributions will be considered for publication as a Special Issue in the Journal on Autonomous Robots.

One major aim of the workshop is also to contribute to the exchange of sample data and robust implementations of the algorithms to facilitate benchmarking. Therefore, in addition to the paper submissions, the authors are encouraged to upload at least one relevant data set or one implementation.

Accepted papers, together with the data and code will be available online at the workshop website.

Organizers

Viorela Ila, Georgia Tech, US
Rudolph Triebel, ETH Zurich, Switzerland
Teresa Vidal-Calleja, ACFR, Australia