

Keynote Address:

Sebastian Thrun

Carnegie Mellon University

'Monte Carlo Algorithms for Mobile Robot Navigation'

Abstract

In recent years, statistically motivated algorithms have become highly popular in robotics. Statistical algorithms are well-suited for robotics, since they address the inherent uncertainty in robot systems at their very core. Apart from a better theoretical understanding, recent research has led to significantly more scalable algorithms for a range of challenging problems in robot perception and control.

In this talk, I will present basic localisation, mapping and exploration algorithms developed at CMU and elsewhere, which are all based on Monte Carlo approximations of Bayes filters and decision-theoretic extensions. The advantages of these algorithms will be illustrated through a series of deployed systems, including the Minerva tour-guide robot which we successfully installed in a Smithsonian museum in Washington, DC. If time permits, I will present research on a programming language extension, with the goal of seamlessly integrating probabilistic data structures and learning into robot programming.