

# Monte Carlo Sensor Networks

*Thomas C. Henderson, Brandt Erickson,  
Travis Longoria, Eddie Grant\*, Kyle Luthy\*,  
Leonardo Mattos\*, and Matt Craver\**

UUCS-05-001

School of Computing  
University of Utah  
Salt Lake City, UT 84112 USA

\*Department of Electrical and Computer Engineering  
North Carolina State University  
Raleigh, NC 27695 USA

20 January 2005

## *Abstract*

Biswas et al. [1] introduced a probabilistic approach to inference with limited information in sensor networks. They represented the sensor network as a Bayesian network and performed approximate inference using Markov Chain Monte Carlo (MCMC). The goal is to robustly answer queries even under noisy or partial information scenarios. We propose an alternative method based on simple Monte Carlo estimation; our method allows a distributed algorithm, pre-computation of probabilities, a more refined spatial analysis, as well as desiderata for sensor placement in the friendly agent surrounded by enemies problem. In addition, we performed experiments with real microphones and robots to determine the sensor correct response probability.