

# **Model Accuracy Assessment in Reaction-Diffusion Pattern Formation in Wireless Sensor Networks**

*Thomas C. Henderson, Anshul Joshi, Kirril  
Rashkeev, and Narong Boonsirisumpun  
University of Utah*

*Kyle Luthy and Edward Grant  
North Carolina State University*

UUCS-13-003

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

30 May 2013

## ***Abstract***

We propose to exploit reaction-diffusion (RD) patterns as part of the wireless sensor network (*S-Net*) high-level structure building toolkit; e.g., to support leader selection or to provide pathways through the network. In particular, we study the formation of RD spot and stripe patterns in *S-Nets* for which no coordinate frame exists; i.e., the nets have only topological connectivity determined by the inter-node broadcast range. We further demonstrate how macro-features of the RD patterns can be used for Bayesian model accuracy assessment of the difference between a uniform grid layout of the nodes versus an irregular grid due to error in node placement.