

*The University of Alabama
Department of Computer Science
Colloquium Series Speaker*

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***An Energy Efficient, Self-Healing Secure Routing Protocol
for Heterogeneous Wireless Sensor Networks***

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Abstract:

Wireless sensor networks are envisioned to have a lot of application areas, such as military, homeland security, environment, agriculture, health care, manufacturing, and so on. The primary functionality of a sensor network is to monitor the environment and transmit the data to a base station for further analysis. Thus, routing is an essential operation in sensor networks. For sensor networks deployed in hostile environments (such as military battlefields), security is critical to ensure privacy, integrity, authenticity, and availability of information and communications.

Past researches on sensor network routing focused on efficiency and effectiveness of data dissemination. Few of them considered security during the design phase of a routing protocol. Furthermore, previous work on sensor networks mainly considered homogeneous sensor networks, that is, all sensor nodes are modeled to have same capabilities. Several literatures have shown that homogeneous ad hoc networks have poor fundamental performance limits.

To achieve better performance and security, I adopt a Heterogeneous Sensor Network (HSN) model. In this talk, I will present a secure routing protocol for HSNs, which is energy efficient and robust to sensor node failures. Our security analysis demonstrates that the secure routing protocol can defend typical attacks on routing. Our simulation results show that the secure routing protocol has better performance than a popular sensor network routing protocol – Directed Diffusion.