

# Wireless and Sensor Networks

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**Neeraj Jaggi**

ASSISTANT PROFESSOR

DEPT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE



**WICHITA STATE UNIVERSITY**

# Research Interests

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## ***Wireless Networks***

CDMA/GSM Wireless Soft Switch

Mobile Social Networks

Mobility Management in Mobile Networks

## ***Sensor Networks***

Energy-efficient Coverage

Energy-efficient Sleep Scheduling

Distributed Node Activation Algorithms

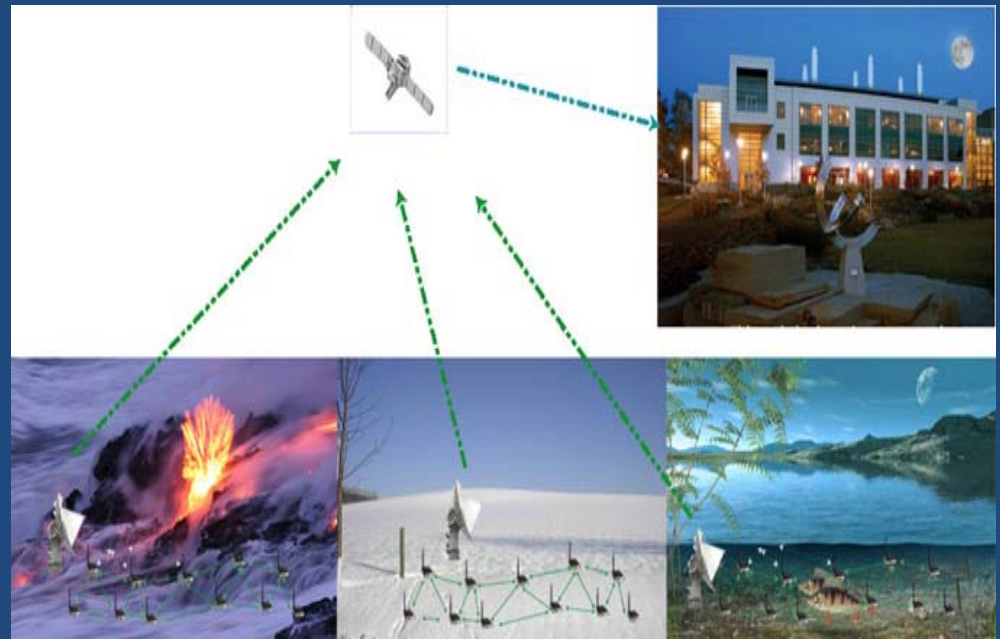
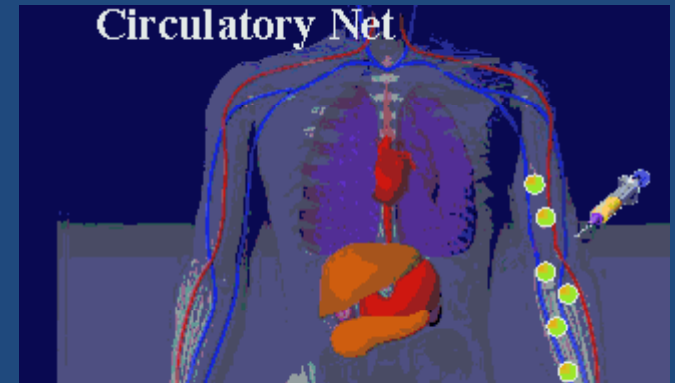
Formal Verification of Distributed Services

## ***Distributed Systems and Security***

# Sensor Networks

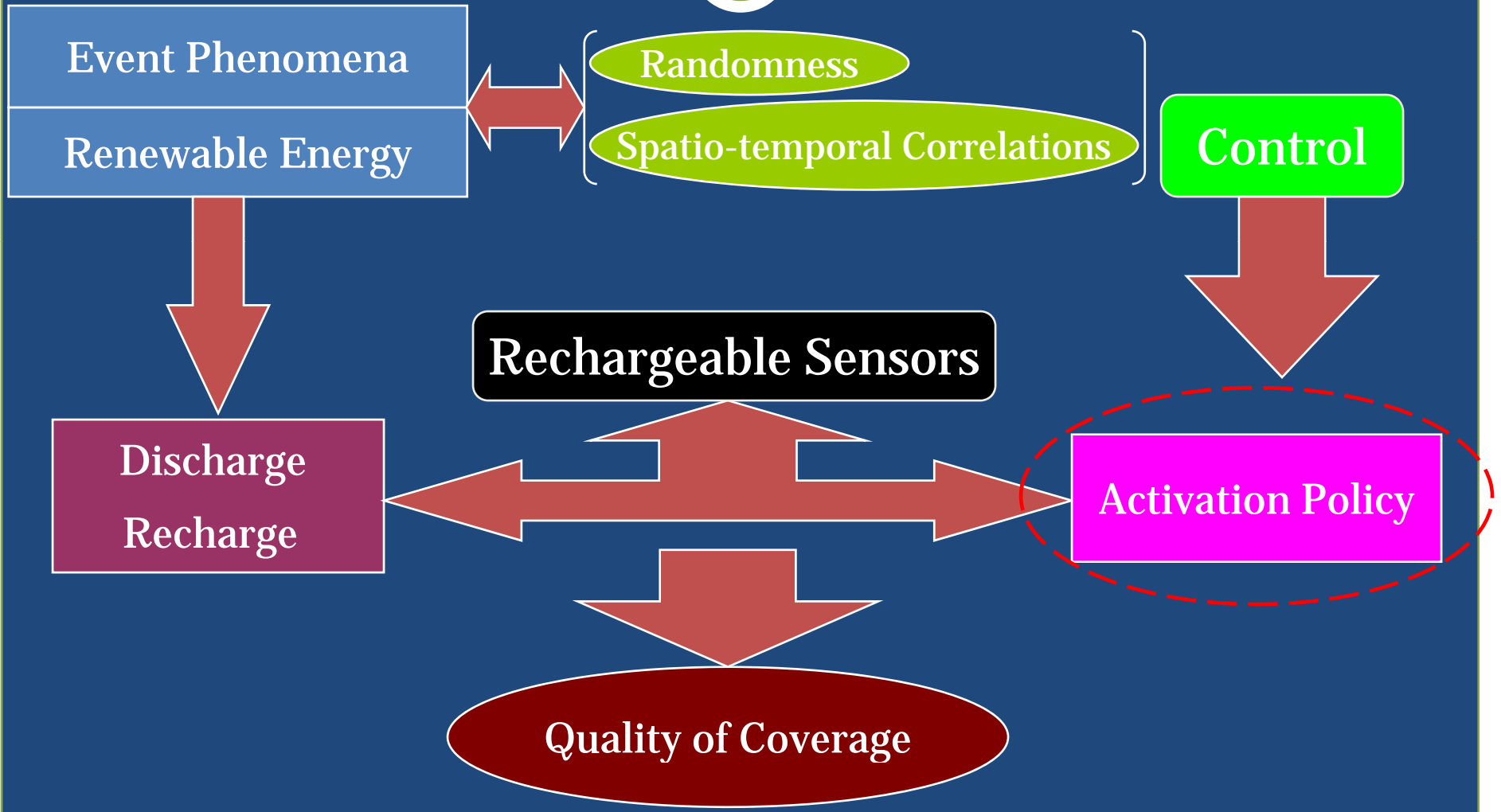
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- **Sensor Nodes**
  - Tiny, low cost Devices
  - Prone to Failures
  - Redundant Deployment
  - Rechargeable Sensor Nodes
- **Range of Applications**
- **Important Issues**
  - Energy Management
  - Quality of Coverage



# Rechargeable Sensor Network

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# Research Question

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- How should sensors be *activated* (“switched on”) dynamically so that the quality of coverage is maximized over time ?
- A sensor became ready. What should it do ?
  - Activate itself *now* :
    - ✦ Gain some utility in the short-term
  - Activate itself *later* :
    - ✦ No utility in the short term
    - ✦ Activate when the system “needs it more”

# Solution Approach

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- Modeling Complexity
  - Randomness
  - Correlation Modeling – Spatial and Temporal
- Modeling Tools
  - Stochastic model, Markov Decision Processes
- Objective
  - Optimize the *Utility* of the Sensor System over Time
  - Design Distributed Algorithms

# Q & A

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THANK YOU !! 😊