



# Energy and Delay: Network Optimization in Cyber-Physical Human Sensing Systems

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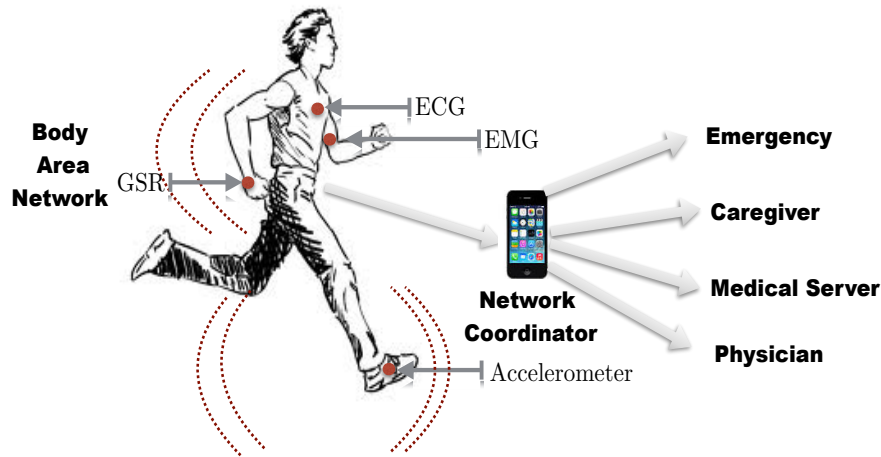
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# Description



## Cyber-Physical System

coupling **bio-sensors** on people and **wireless networks**

### Goals

Enable **real-time monitoring** of health behavior and **feedback** via adaptive and personalized interventions

### Design challenges

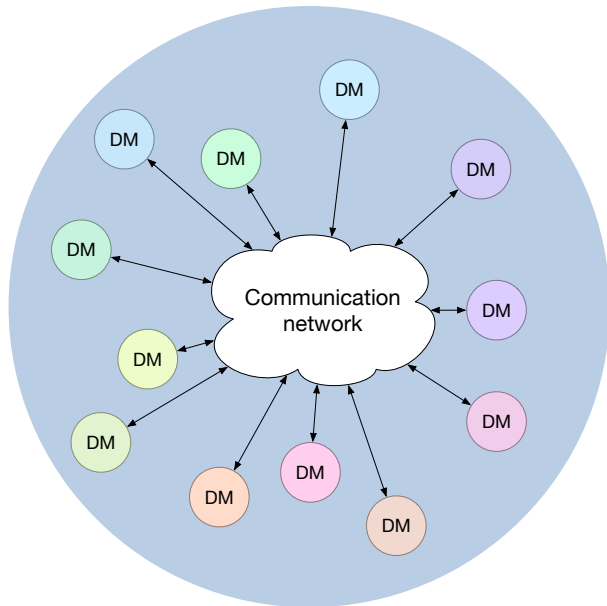
Sensors and data **heterogeneity**

Sensor and coordinator **energy constraints**

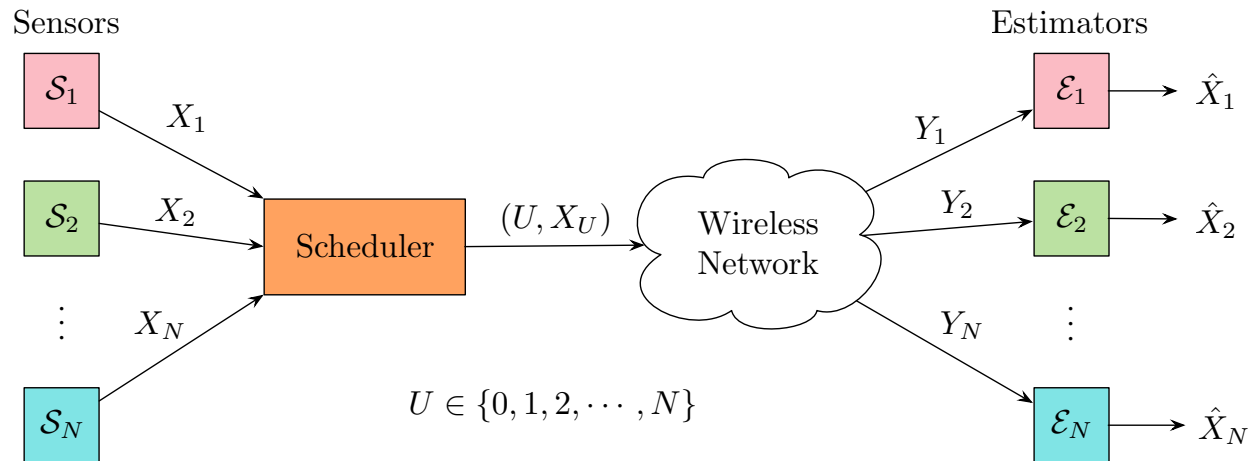
Sensing and communication are **state dependent**

### Networked decision systems

New decision-making problems involving **the joint design** of **sensing**, **communication** and **control**



# Findings



- Joint design of scheduling and estimation policies
- Sequential estimation problem with limited number of transmissions
- Wireless network with **broadcast** and **unicast** communication protocols

**Signaling** – Communication through silence

## Main result

**Globally optimal** scheduling and estimation policies for iid sources under some symmetry assumptions

- Markov sources: transmit innovation sequence using policies for the iid case