

Challenges and Opportunities in Bringing Smart Services to **Urban Underserved** Communities

- Understanding the societal context and ethos
- How can existing initiatives smart cities and communities can achieve *fair access and neighborhood equality*?
- What technology innovations will help bring smart services and CPS to the urban underserved?

The Societal Context

- How to build social capital in underserved communities
- Importance of leveraging the assets of underserved communities, including citizens, civic orgs, local business
- Importance of governance, policy, community engagement, and trust building
 - Importance of designing functions for realizing governance with technology support
- Challenge of unlocking data (including protected health information across systems while preserving HIPAA, governance, and privacy issues)

The Technology Context: Networking

- Large gaps in connectivity and information access
- Rethink and innovate in wireless network on the edge to connecting things
 - Low power wide area networks, wireless meshes, access across heterogeneous networks, unlicensed TV white spaces (700MHz), MANETs, delay tolerant
 - while not new, rethinking is needed, e.g. software defined networking
 - Computing and learning inside with edge wireless networks

Computing Services and Infrastructure

Information Technology + Operational Technology + Social Computing

- requires domain expertise and community engagement

Cloud centralization and wide area internet does not work well for these communities

- using city-community edge cloud is well positioned for political, economic, and technological reasons

Leapfrogging underserved communities over the digital divide

- by supporting rich computing services even on low end devices

Interesting Discussions

- Incentivizing computer science faculty and graduate students to work on these problems
 - Investment in learning the domain with interdisciplinary engagement, while getting academic payoff
- What are viable business models for scaling delivery
- Sustainability models

Disruptive Research Areas

Since decentralizing is key to enabling the services, need:

- Low cost, robust networking of edge
- Software stack for the edge
- Achieving guarantees of isolation, trust, privacy in this ecosystem