Smart Aging: Connecting Communities Using Low-Cost and Secure Sensing Technologies

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Community Identified Problem

- Large and growing percentages of 65+ older adults aging in Suffolk County, NY and the nation (17% and 16%) create a "Silver Tsunami"
- >80% of older adults want to live independently at home with quality of life, autonomy and dignity, overwhelming care providers, facilities and hospitals, causing a social and economic crisis,

Intellectual Merits

- Robust, secure, affordable sensing technologies for longitudinal monitoring of vital signs, physical activities and social interactions, combined with analytics for detection of emergencies, and early indicators of health changes in a privacy-preserving, nonintrusive manner
- Social solutions to foster positive perceptions and greater adoption of technologies, effective data representation and delivery means to stakeholders, and quantitative, data-driven measures for social determinants of health

Project Activities and Outcome

On technology, we have

- Conducted an in-depth study of the impact of radio parameters on vital sign extraction accuracy, and found some surprising results on time/spatial diversity not improving performance
- Studied sensor location, sleep posture on vital signs quality for over night data collection to develop guidelines for at home deployment
- Developed a self-calibrating indoor trajectory tracking system which a layman user can easily configure with one-minute's walking for scalable deployment

On social science, we have

- Expanded our community engagement to include diverse populations and organizations: health care providers (nursing PT/OT and social workers); discussions with LISVH, injure prevention group; new recruitment to organizations by location, size, and population
- Refined our vignette and focused on older adults with specific diseases representing greater vulnerability and need
- Presented our work at community and academic venues (LISVH, School of Social Welfare course on aging, School of Nursing AGNP)

Immediate Impact

- Expanded community dialogue and footprint, and increased community awareness of benefits of technology use for aging in place
- Lectures to future practitioners (doctoral, nursing and social welfare students) to gain awareness and familiarity in sensor use to assist with aging in place for their future practice

Lasting Impact

- Change the practice of care delivery through technology adoption to sustain independent living of older adults utilizing continuous home-based sensing data while preserving privacy
- Alleviate the burden of family caregivers, care providers, and the general health system to address the "Silver Tsunami"

Next Steps

- Continue to test system reliability and performance, develop guidelines for sensor installation and usage using a simulated lab, and conduct initial data collection with human subjects including team members and particular older adult populations
- Explore methods for technology adoption for inclusion of sensor data and discovery in patient care workflow, and continue discussions with diverse stakeholder groups to provide broader perspectives
- Increase our project's visibility and recognition in communities and invite select students from difference disciplines to joint our research