People-Aware Computing
Improving Quality of Life using Mobile Devices

THE DARTMOUTH INSTITUTE
FOR HEALTH POLICY & CLINICAL PRACTICE

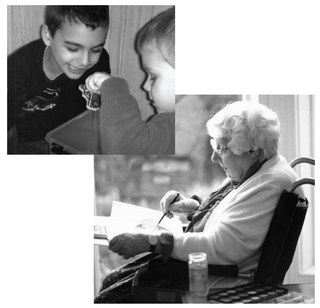
Community-Scale Modeling of Human Behavior

Develop technology that is easy to use, unobtrusive, and adaptive, which enables us to:

- Record, review, search, and reflect on our real-world activities and interactions
- Analyze how behavior patterns impact quality of life
- Provide relevant feedback to individuals, family, and health-care professionals

Physical Health

Emotional Health



Cognitive Health

Family and Community Wellness

Improve Health, Family, and Community Well-being

Increased access to care

Continuous and in-situ monitoring of individual and population health

Improved quality of care

Detailed analysis of behavioral factors that influence physical, social, and cognitive well being

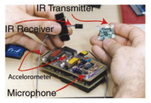
Reduced cost and improved effectiveness of care

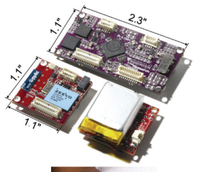
Lowering effort needed for early diagnosis, behavioral interventions and self-monitoring

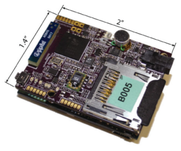
Goals

Sense

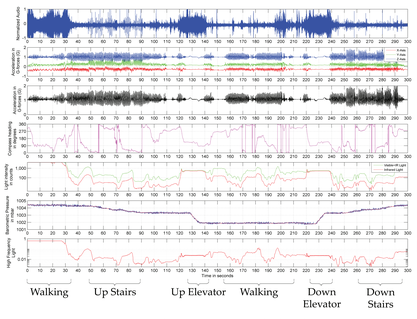
Capturing behavioral data unobtrusively







Different generations of Mobile Sensing Platforms for continuous data collection



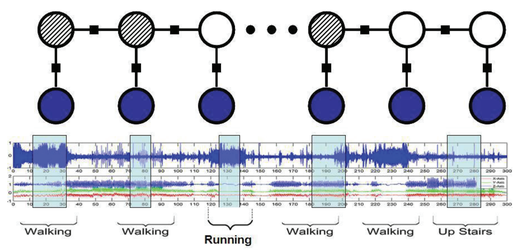
Sensors capture sound, movement, light, location, elevation

Current smart phones have many of the sensors we need

Infer

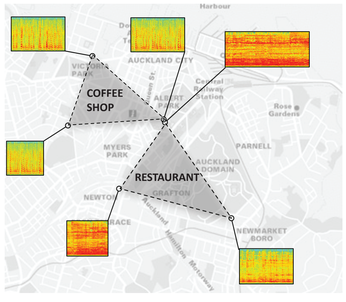
Continuously inferring fine-grained patterns of human behaviors

automatically, unobtrusively, and with user consent at individual, family, neighborhood, and societal scales



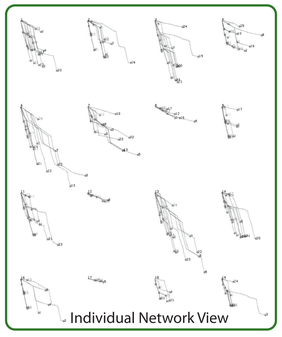
Activities

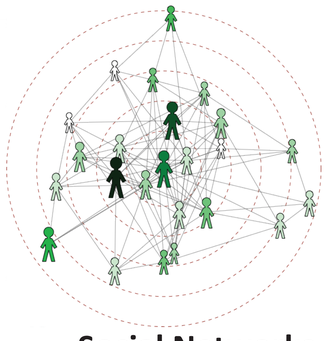
Activities modeled: walking, running, taking stairs up/down, taking elevator up/down, cooking, working on computer, eating, watching TV, talking, cycling, using an elliptical trainer, using a stair machine



Places

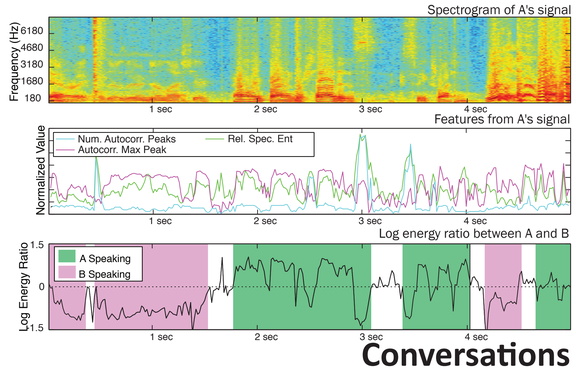
Places modeled: home, work, gym, restaurant, coffee-shop,library, bank, grocery-store, indoor/outdoor





Social Networks

Building models of social networks that enable analysis of global structure as well as individual profiles and their impact on the network



Conversations

Conversational attributes modeled: who talks to whom, frequency, durations, speaking styles that include loudness, speaking rate, emotions

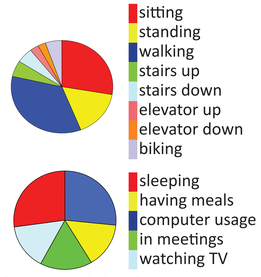
Societal Impact

Inform

Providing relevant feedback

Individuals

Behavioral feedback that encourages healthy life-style by:
- raising awareness
- providing in-situ feedback



Daily Activity Summary

Elder-care monitoring

Family members and Caregivers

Reduce elder-care burden by:
- automating daily activity monitoring
- raising alerts as needed

Doctors and Public Health Official

Monitor health outside the doctor's office at an individual and population level
- early detection and prevention of health problems
- analysis of environmental and demographic factors

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