Lightning Introductions

Trans-NIH/Interagency Workshop on the Use and Development of Assistive Technology for the Aging Population and People with Chronic Disabilities

September 10-11, 2014

Alice Borrelli / Intel

Director of Global Healthcare Policy

Sara J. Czaja
University of Miami Miller School of Medicine

Leonard M. Miller Professor, Department of Psychiatry and Behavioral Sciences
Scientific Director, Center on Aging
Director, Center for Research and Education on Aging and Technology Enhancement (CREATE)

How can we assure that vulnerable older adult populations have “meaningful access” to technologies and technology applications that meet their needs and enhance their well-being and quality of life?

UHealth
UNIVERSITY OF MIAMI HEALTH SYSTEM
Center on Aging

UNIVERSITY OF MIAMI
MILLER SCHOOL
of MEDICINE

Erin Iturriaga / NIH

What are the evidentiary requirement to move research on the topic of aging in place into practice?

Program Officer/Clinical Trials Specialist
National Heart, Lung, and Blood Institute

National Institutes of Health

Jeff Kaye

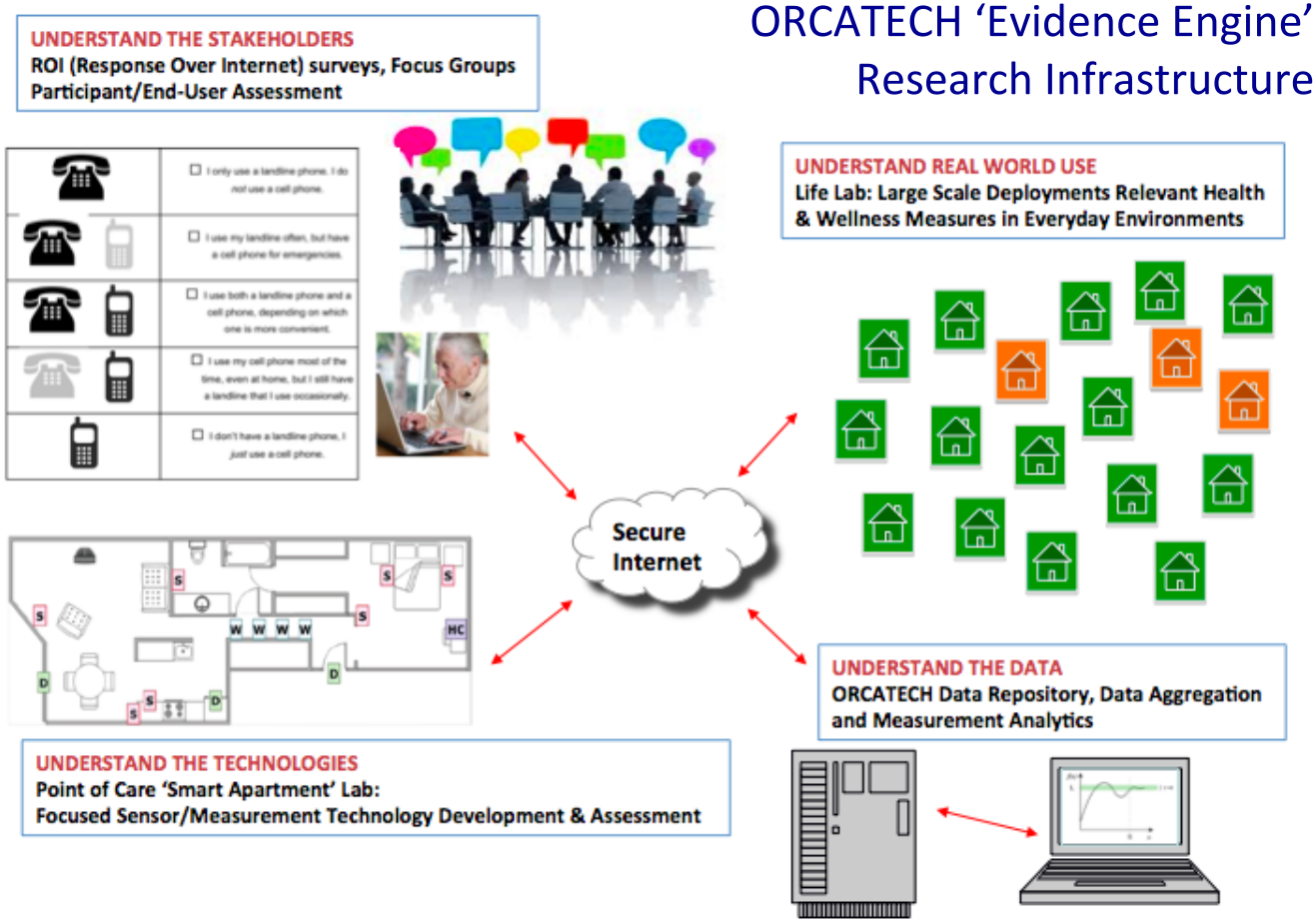
Oregon Health and Science University

Layton Professor of Neurology & Biomedical Engineering

Director, ORCATECH

Director, Layton Aging & Alzheimer's Disease Center

ORCATECH 'Evidence Engine' Research Infrastructure



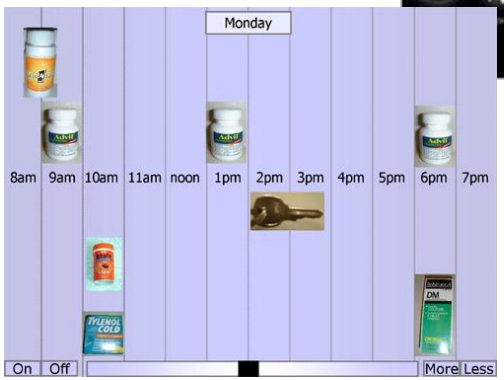
Anecdote is not the plural of data: what is the evidence needed to move technology assisted solutions into meaningful practice?

Elizabeth Mynatt
Georgia Institute of Technology

Professor
Interactive Computing
Georgia Tech

Vice-Chair
Computing Community
Consortium (CCC)

Worked in the "Aware Home" on Aging in Place Technologies including the **Digital Family Portrait** (caregiver awareness) and **Memory Mirror** (cognitive support)



BIG QUESTION FOR THE WORKSHOP

How do we create technologies and services that evolve as a person ages and their health needs change?

Wendy Nilsen / NIH & NSF

How do we seamlessly build health into our digital world?

Health Science Administrator,
Office of Behavioral and
Social Science Research, NIH
Program Director, Smart & Connected Health,
CISE, NSF

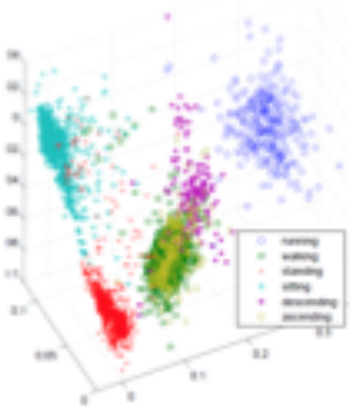
National Institutes of Health

Daniel Siewiorek/ Carnegie Mellon University

Quality of Life Technology Center
a National Science Foundation Engineering Research Center

How to make technology adapt to my needs as my abilities

Machine Learning



Virtual Coaches

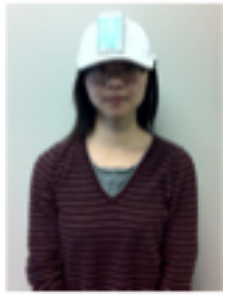
Physical Therapy Coach

Seating Coach

Buhl University Professor
Computer Science and
Electrical & Computer Engineering

Director
Quality of Life Technology Center

Stroke Therapy Coach



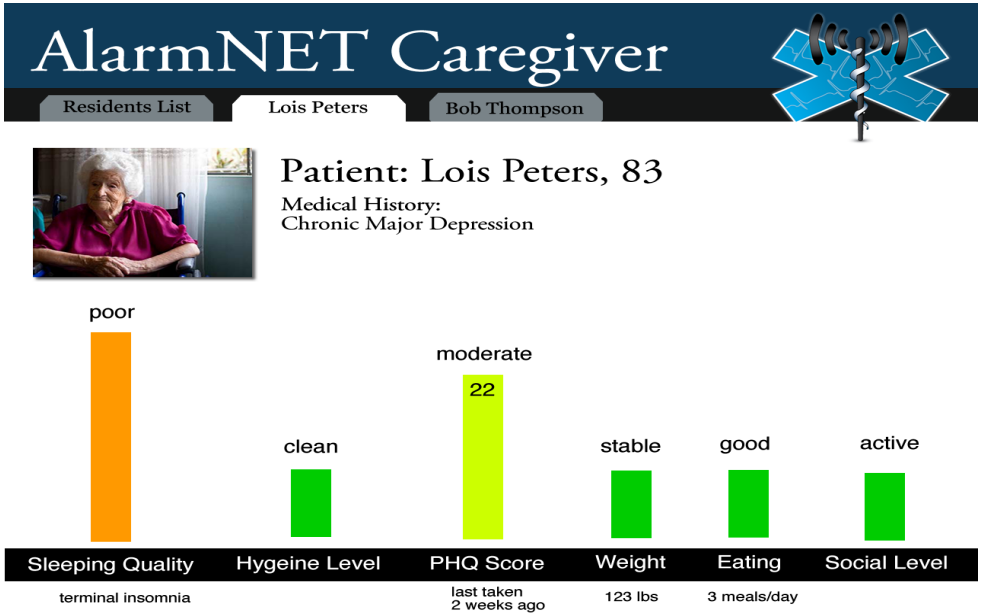
HeadCoach

John Stankovic / University of Virginia

BP America Professor
Dept. of Computer Science

Co-Director: Center for Wireless Health

How to make the in-home and on-body technology for wireless and mobile health robust, safe, accurate, and disappear!



Timothy Bickmore
Northeastern University

Challenge:

Consider the disadvantaged.

http://relationalagents.com

Melinda Buntin/Vanderbilt Health Policy

How must our fiscal and social policies adapt to care for an aging population?

Neil Charness
Florida State University

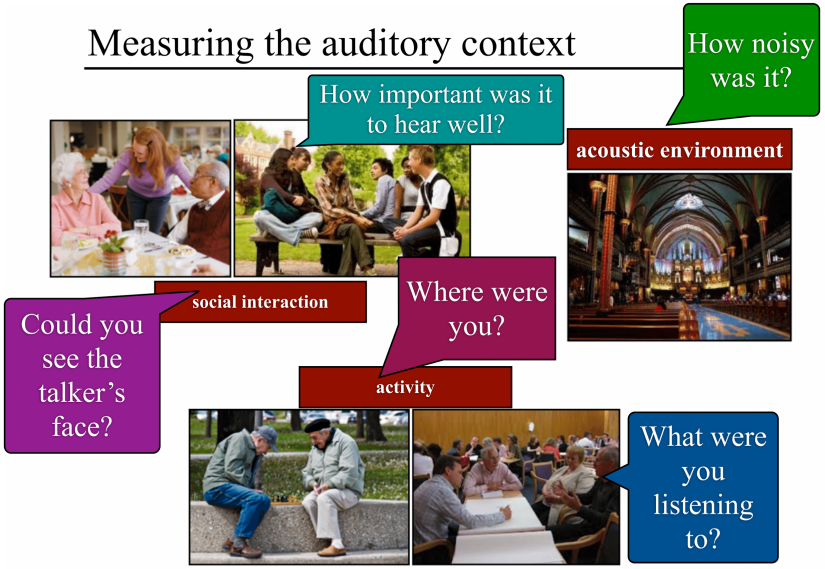
William G. Chase Professor of Psychology
Interim Director, Institute for Successful Longevity

How can we develop technology that enables people to set, pursue, and (hopefully) achieve their goals across their lifespans?

Octav Chipara/ University of Iowa

Assistant Professor
Department of Computer Science
University of Iowa
Part of the Aging Mind and Brain Initiative

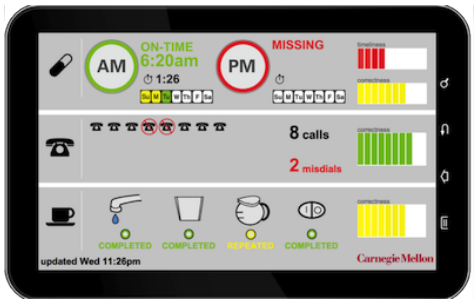
Context-Sensitive Evaluations of Hearing Aids In-situ



How can we combine infrequent user feedback and continuous sensor measurements to improve assessment methods?

Anind K. Dey, Carnegie Mellon University

Associate Professor
Director, Human-Computer Interaction Institute
Carnegie Mellon University



dwellSense

How do we use the huge amount of passively and actively collected health data to improve assessment and diagnostic capabilities?

Ann Drobnis - CCC, Director

Working to bringing communities together around computing and technology.

How can we use the information already being collected to aid in the care of individuals?

CCC
Computing Community Consortium
Catalyst

Kenneth Gabriel / Prognosys

Gwendolyn Graddy-Dansby, M.D., F.A.C.P.
Center for Senior Independence

Medical Director,
Center for Senior Independence

Henry Ford Health System

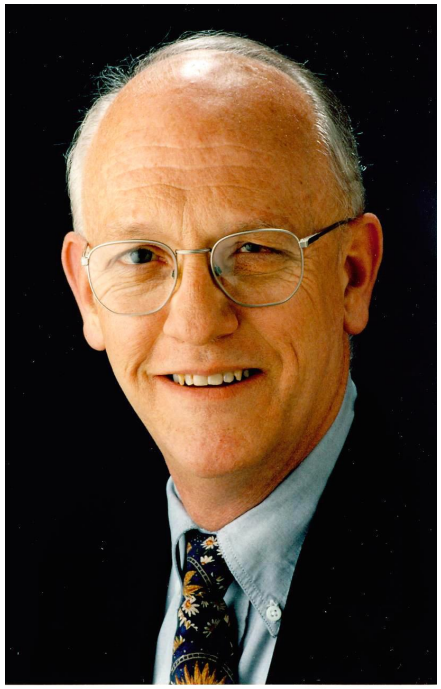
Center for Senior Independence

Henry Ford Innovation Institute

The Program of All-Inclusive Care for the Elderly (PACE) program is an innovative model of care for aging individuals. Using an Interdisciplinary Team, our goal is to support healthy aging and aging in place. Our purpose is to promote quality of life for frail seniors living in their community by offering care for their medical, social, and physical needs.

How do we maximize and bridge high-touch using the concept of PACE and high-technology in the 21st Century?

Dave Gustafson/ University of Wisconsin-Madison



No One Should Have to Suffer Twice!

How do we help elderly people feel like they have a reason to live?

Greg Hager
Johns Hopkins University

Professor and Chair, Computer Science
Johns Hopkins

Chair, Computing Community Consortium

How can we develop systems that adapt to a user as their mental and physical abilities decline?

Vicki Hanson

Distinguished Professor
Human-Computer Interaction,
Accessibility

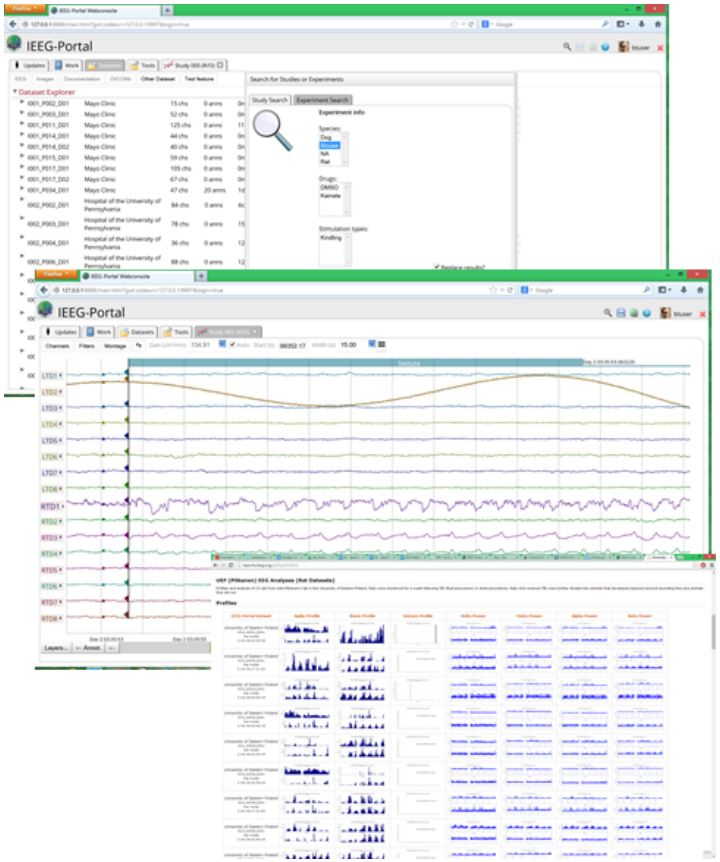
"The corridors are so long and I get lost so I just wait for someone to push me instead of walking"

How do we take advantage of technology without overwhelming the its users?

Bill Hanson/ University of Pennsylvania

Zack Ives

IEEG.org:
Collaborative data sharing for the biomedical sciences



Penn
University of Pennsylvania

How do we build the capabilities for allowing clinicians, device manufacturers, and scientists to develop new capabilities for monitoring health and improving life?

Robert Jarrin/ Qualcomm

Can some aspects of long-term care (LTC) be made available through affordable, smart, digital home-use medical and assistive wireless technologies?

With more and more Americans aging in place and becoming disabled, in the absence of Medicare, affordable supplemental insurance, disability insurance, or Social Security disability benefits, will there come a point when the federal government be forced to deal with America's LTC affordability problem?

Senior Director, Government Affairs
Qualcomm Incorporated

Holly Jimison / Northeastern University

Consortium on Technology for Proactive Care

Question: What technology innovations could help us incorporate what matters most to older adults (feeling needed, independence, self-actualization, socialization, ….) into health interventions ?

Remote Health Coaching of Older Adults in the Home

Physical Exercise: Tailored Assessment/Intervention

Cognitive Ex
Physical Ex
Sleep
Mood
Socialization
Novelty
Medications

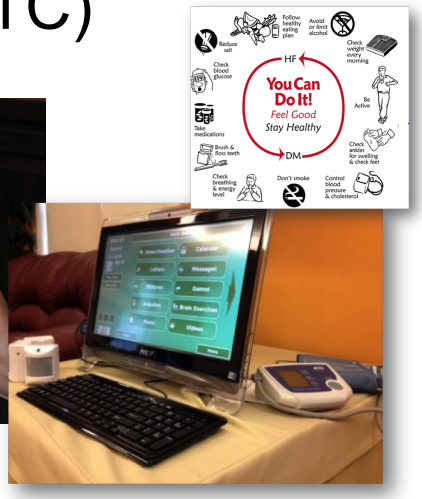
Cognitive Exercise: Computational Models of Cognitive Function

Brian Jones

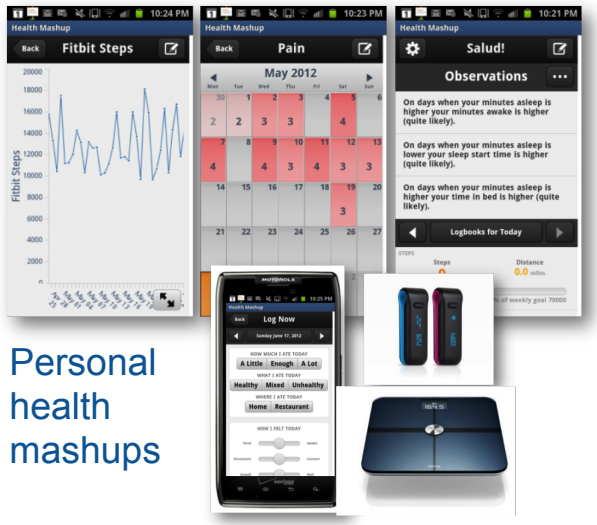
Georgia Institute of Technology

Director, Aware Home Research Initiative
Senior Research Engineer, Interactive Media Technology Center (IMTC)

Onacom connected communication



Health coaching CHF, diabetes



Personal health mashups

The Aware Home - connected home monitoring

How can integration / analysis of information from innovative technologies interpret an individual's needs and empower them to live healthier lives?

Georgia Tech Aware Home Research Initiative

Emil Jovanov
University of Alabama in Huntsville

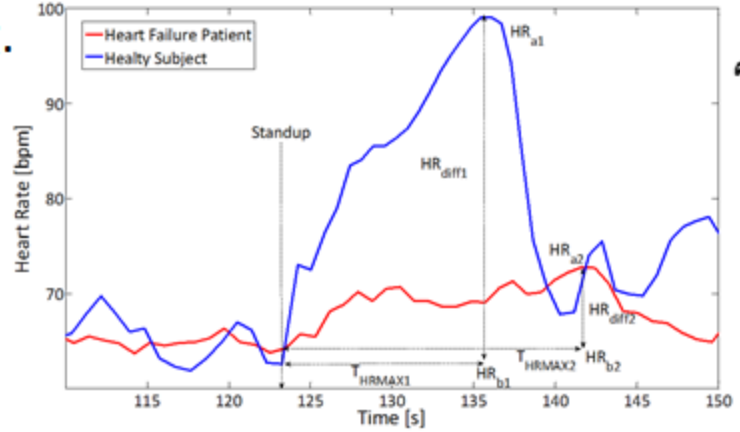
Associate Professor
Electrical and Computer Eng.

Co-Director:

- mHealth Lab
- Real-time Physiological Monitoring Lab

THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

How can we use wearable monitoring and ambient intelligence for early detection of health deterioration?



myomo my own motion

Steve Kelly

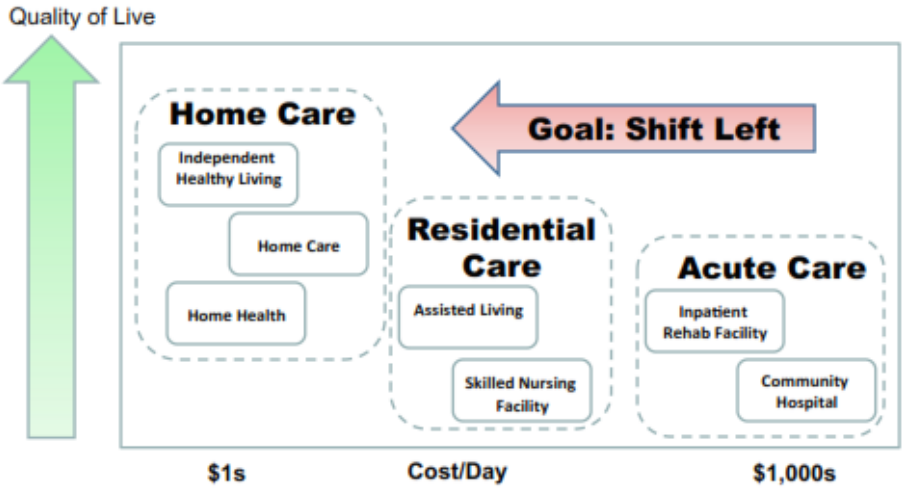


Founder/COO | Smart Orthotics | Kendall Square | Restoring Independence

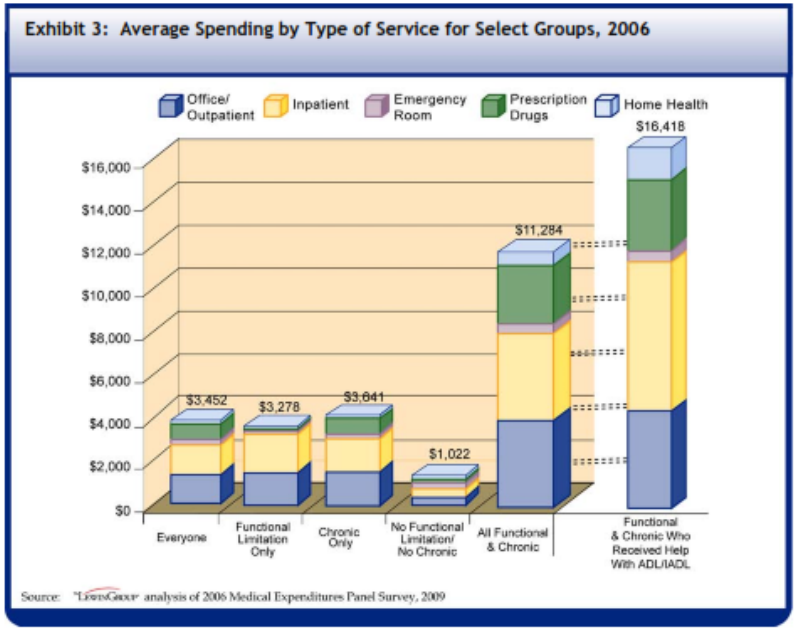
Question:

With 10,000 Boomers turning 65 per day, how does the US keep them in a low cost setting (home) and flatten the cost of the most expensive (need daily help with ADL/IADLs)?

Problem Elements:



People with Functional Limitations and Chronic Conditions Spend More on All Types of Health Care Services



Solution Elements:

Smart Phones, Homes, Cars, & Orthotics

Internet of things

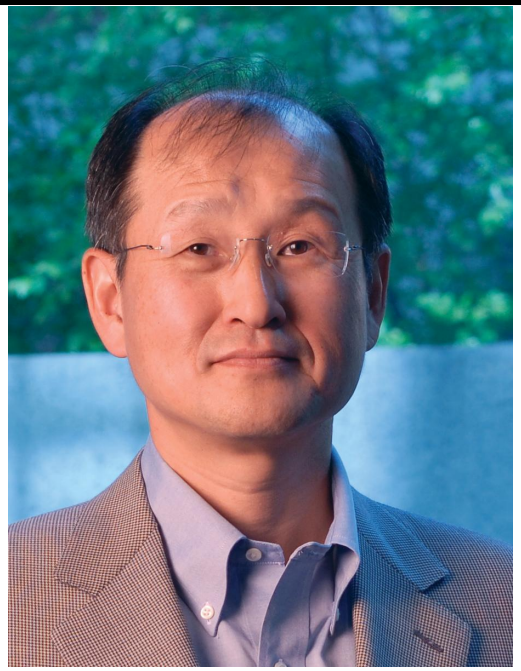
Big Data

Quantitative Self

Man-Machine Interface

Crowd Sourcing

Insup Lee / University of Pennsylvania



Cecilia Fitler Moore Professor
Computer and Information Science

Director
PRECISE Center

How to monitor vulnerable individuals and provide for "as needed in real-time" connection to the health care system and thereby to allow them to stay safely in the living environment of their choice longer?

- Medical CPS
- Medical Device Interoperability
- Mitigating Alarm Fatigue using Smart Alarms
- human-in-the-loop autonomous systems

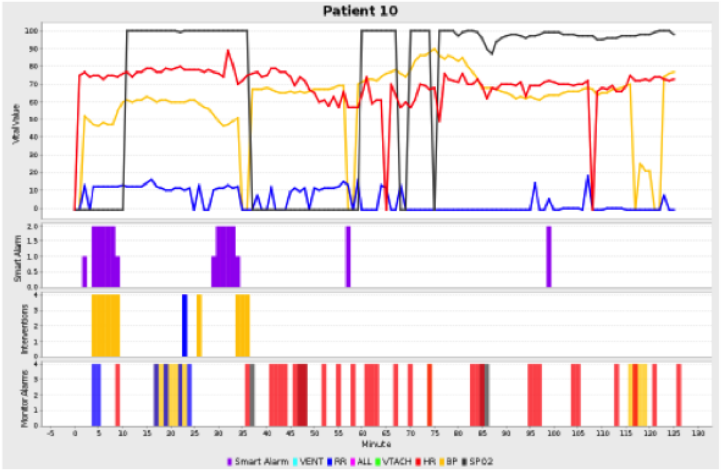


Fig. 3. Vitals signs and alarms; The top row is a trace of vital signs, smart alarm response is the second row, alarms resulting in an intervention are third from top and spurious alarms are in the bottom row. The smart alarm response tracks with the occurrence of intervention alarms.

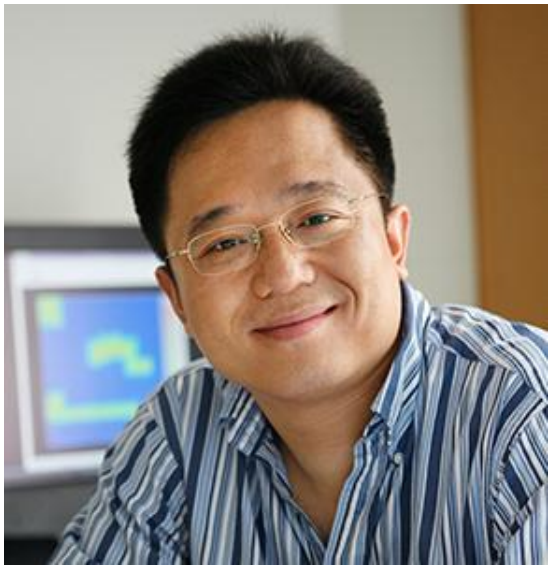
Tony Lee / Philips

Clayton Lewis/ University of Colorado

Global Public Inclusive Infrastructure (gpii.net)

How can we shape standards-based, public information infrastructure to meet the needs of people as they age?

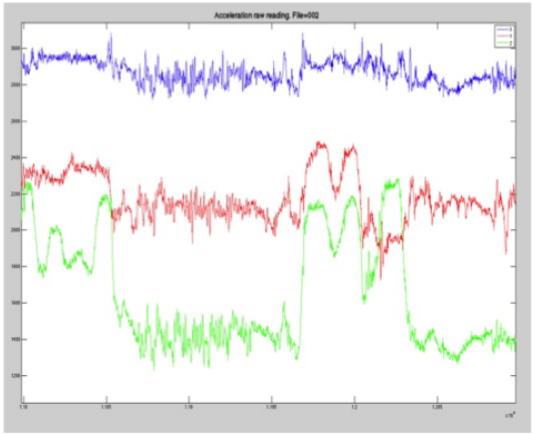
Chenyang Lu / Washington University



Professor of Computer Science and Engineering

CPSL
Cyber-Physical Systems Laboratory

What are the fundamental computer science questions underlying practical aging in place systems?

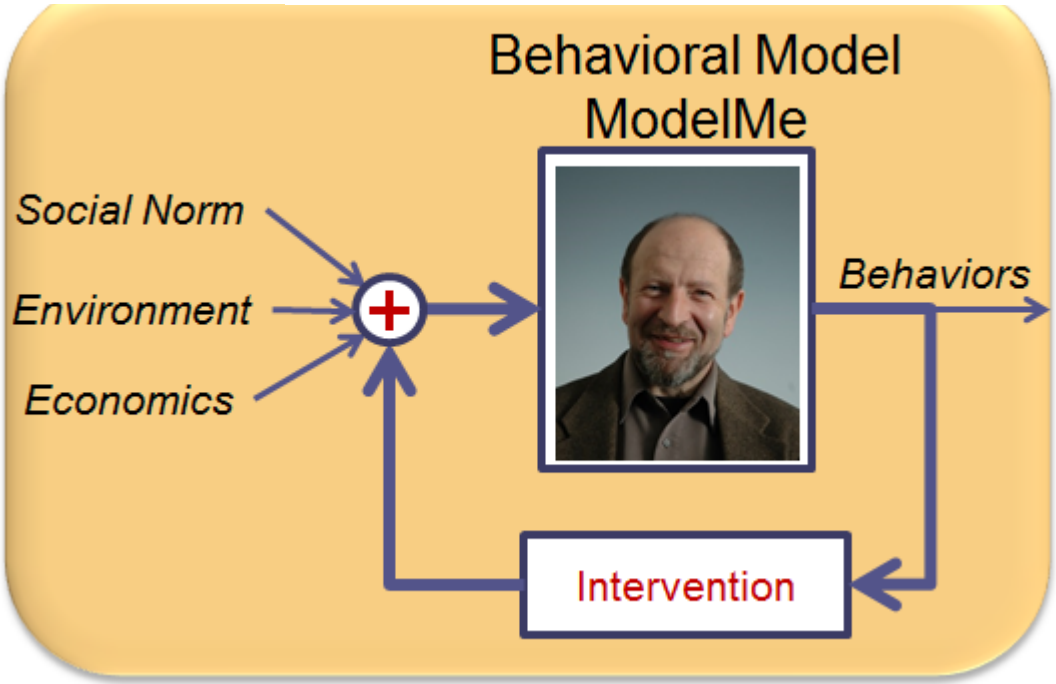


Fall Study in Community-Dwelling Older Adults

- Six participants with mean age of 73 years
- Wore the device for an average of 10.33 days
- Had an average of 3.83 falls (range: 0-12)

Misha Pavel / Northeastern University

Consortium on Technology for Proactive Care



Research Focus:
Behavioral Informatics

Using computational modeling of behaviors to infer cognitive and physical functionality and to optimize interventions

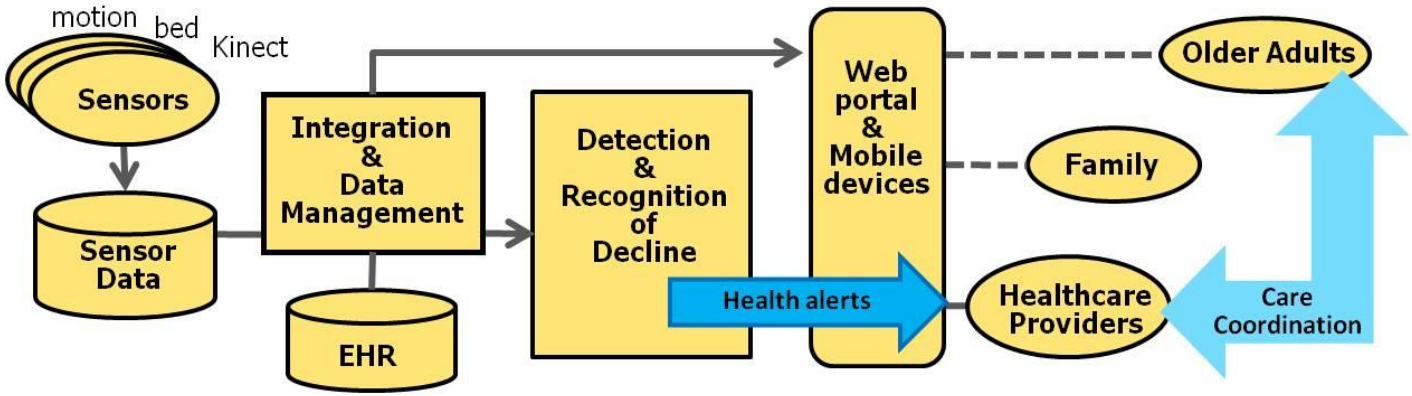
What are the scientific principles that would enable us to:

- Augment human cognitive and physical capabilities
- Help people feel young, useful and managing their health
- Effortlessly improve health behaviors
- Use big data analytics to improve prediction and inference

Marilyn Rantz / University of Missouri

Curators' Professor, MU Sinclair School of Nursing
Executive Director, Aging In Place, TigerPlace

How can we use technology to proactively keep people healthy and functionally active, engage them in self-management strategies AND improve their quality of life AND have better health outcomes AND save healthcare dollars?



Wendy Rogers
Georgia Institute of Technology

Director: Human Factors and Aging Laboratory

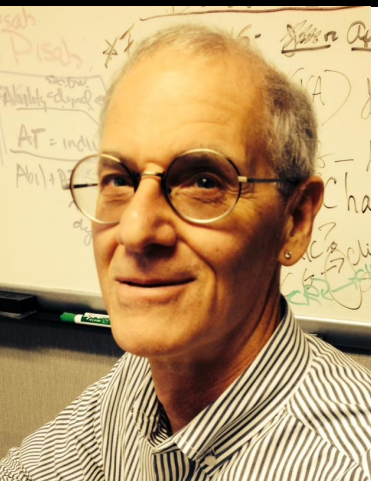
CREATE: Center for Research and Education on Aging and Technology Enhancement (NIH/NIA)

TechSAge: RERC on Technologies to Support Successful Aging with Disability (NIDRR)

How can technology ENHANCE the lives of older adults...

...by enabling, augmenting, empowering, advancing, energizing, engaging, etc.

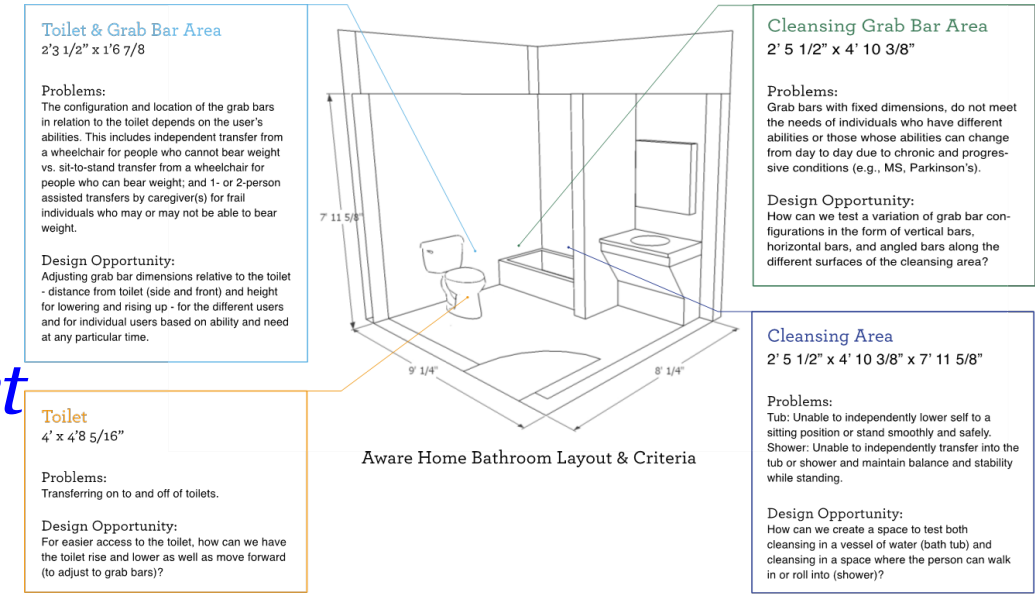
Jon Sanford
Georgia Institute of Technology



Director: Center for Assistive Technology & Environmental Access - Enabling Environments (ee) Lab

PI: RERC on Technologies to Support Successful Aging with Disability (NIDRR)

How do we seamlessly integrate the digital and physical worlds to support our needs and abilities at any point in time?



Aware Home Bathroom Layout & Criteria

Georgia Tech College of Architecture
Center for Assistive Technology and Environmental Access

Maureen Schmitter-Edgecombe
Washington State University

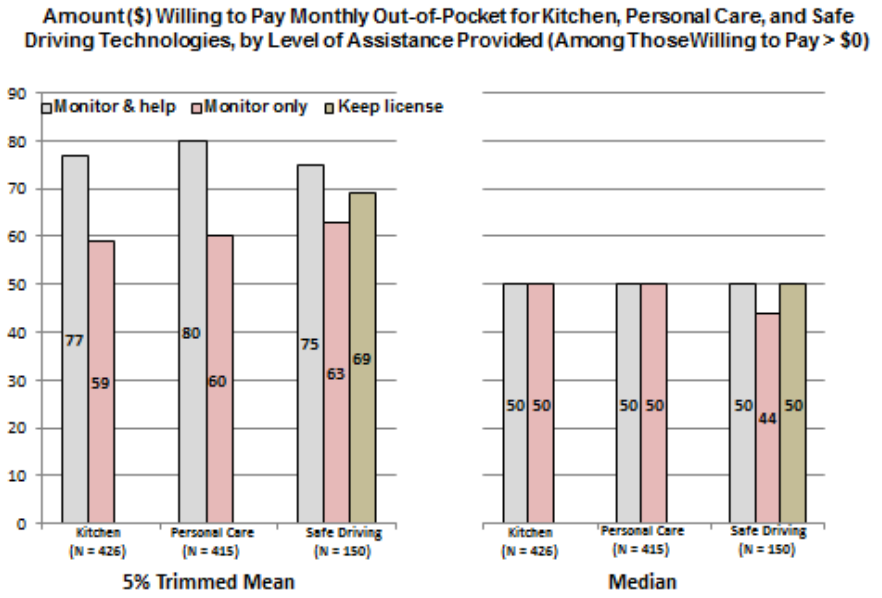
CASAS
Center for Advanced Studies in Adaptive Systems
WASHINGTON STATE UNIVERSITY

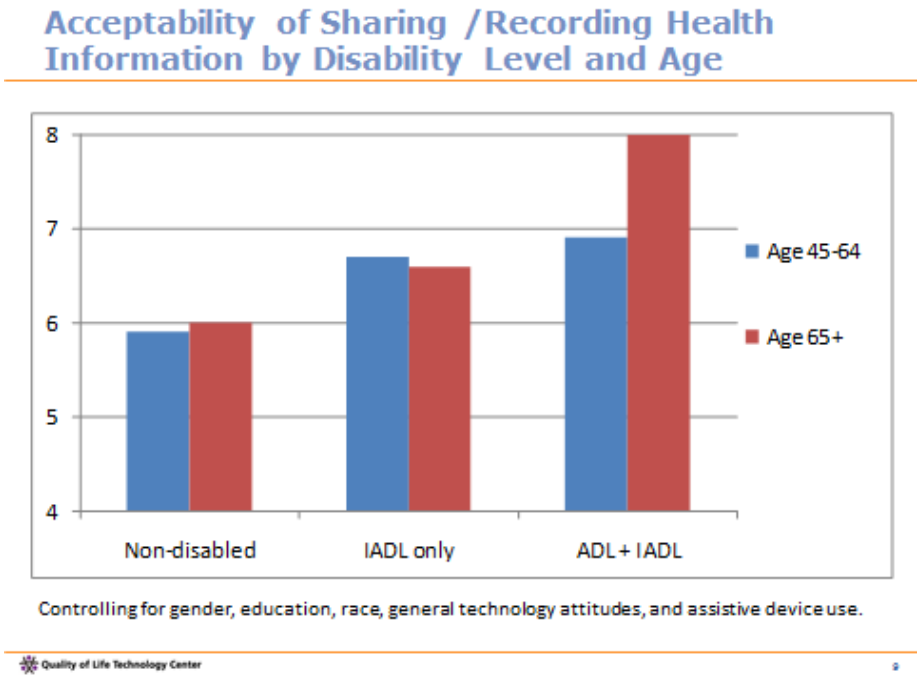
Meyer Distinguished Professor
Department of Psychology

How can we improve human health and support aging in place with smart technologies that aid with health monitoring, assessment and real-time intervention?

Richard Schulz / U. of Pittsburgh

The role of privacy and willingness to pay on technology uptake among older individuals and family caregivers.





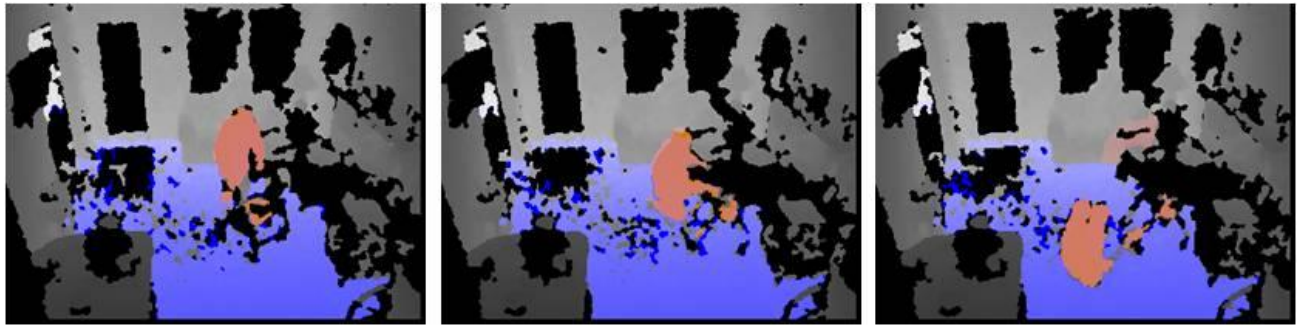
Informal caregivers may be a better target/market for technology development than older persons themselves. What technologies can we develop to facilitate their role in supporting family and friends with disability?

Quality of Life Technology Center

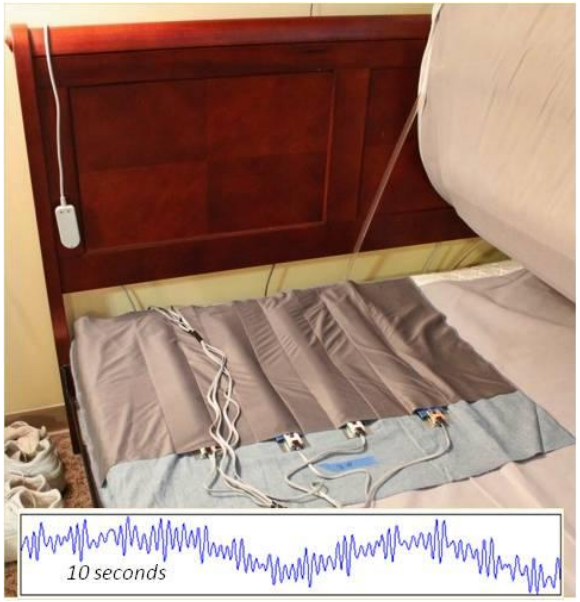
Marjorie Skubic / University of Missouri

How can we capture each individual's needs and create technology systems that automatically customize to fit their needs?

***Professor*, Electrical & Computer Engineering**
***Director*, Center for Eldercare & Rehabilitation Technology**



Using Kinect depth images to capture falls and in-home gait

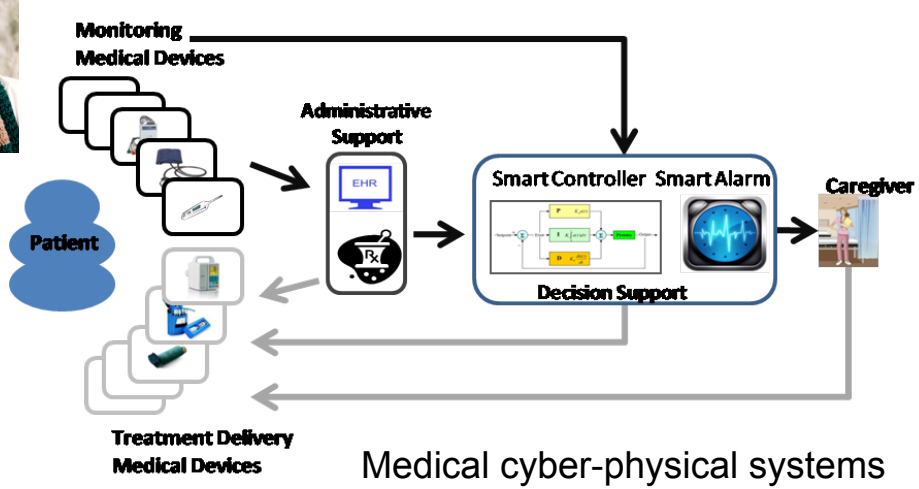


Bed sensor captures pulse, breathing & restlessness

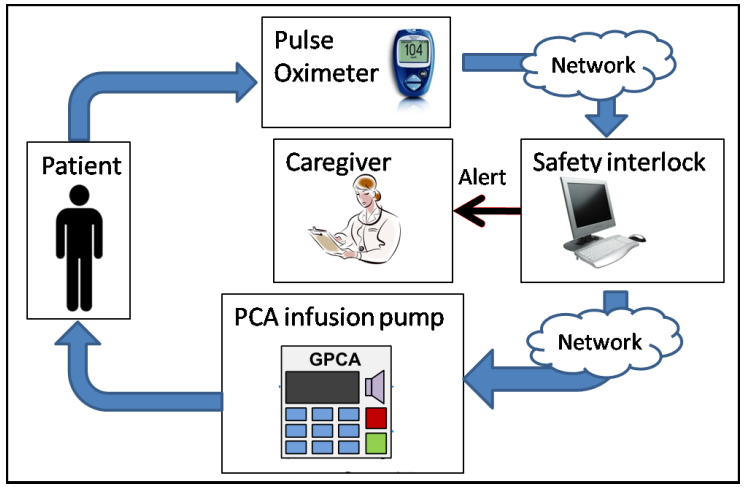
Oleg Sokolsky
University of Pennsylvania

Penn Engineering

Research Associate Professor, PRECISE Center, School of Engineering and Applied Sciences

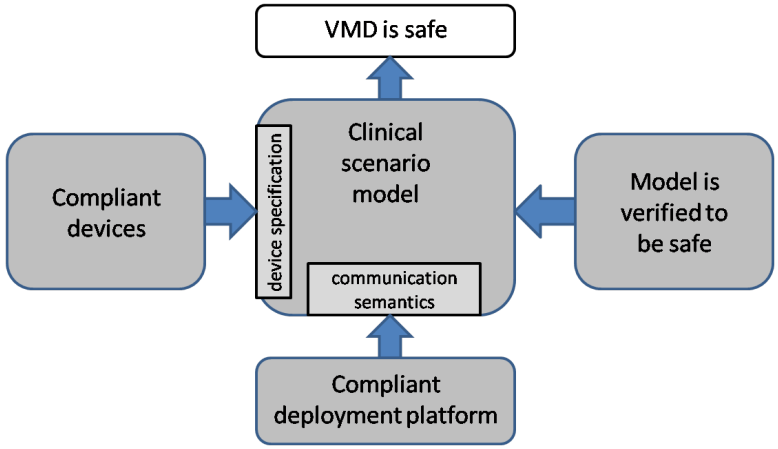


Medical cyber-physical systems



Safety of physiological closed-loop systems

How do we leverage the great promise of modern technology without compromising safety of the patient?



Assurance techniques for medical CPS

Bob Sproull
University of Massachusetts

former Vice President and Director, Oracle Labs

Chair, Computer Science Telecommunications Board, National Academy of Engineering

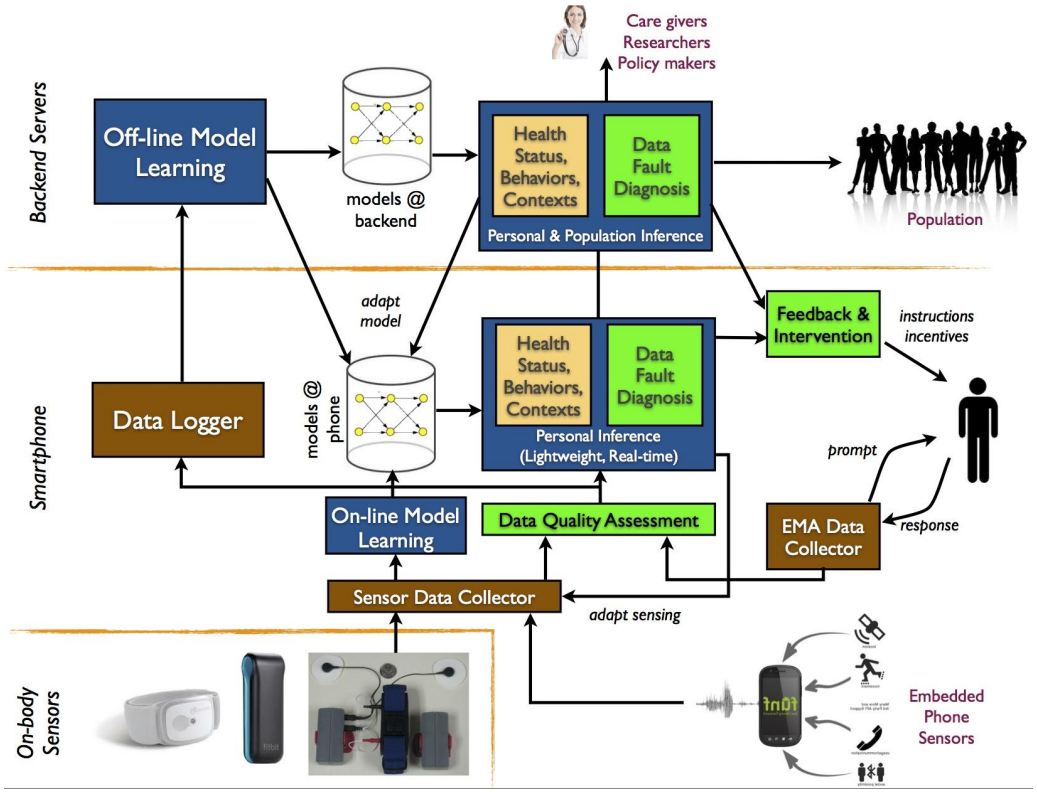
Mani Srivastava

UCLA

Professor & Techno-Optimist

Research: Embedded & Mobile Computing and Sensing, Privacy & Security, Human-Cyber-Physical Systems

Pervasive sensing, analytics, decision, and intervention technologies for various human concerns that are *unobtrusive* (easy to deploy, use, manage) and *trustworthy* (effective, reliable, resilient, privacy-sensitive).



Ransom Towsley

How can technology best support the informal caregiver?

Corporate Senior Director of Community Services
&
Executive Director of Presbyterian SeniorCare at Home

Presbyterian SeniorCare at Home™
Positively Living

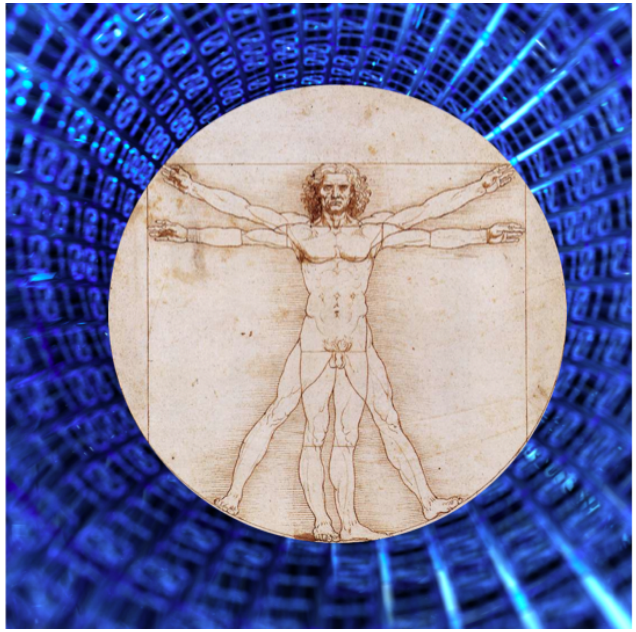
Howard Wactlar
Carnegie Mellon University

Quality of Life Technology Center
a National Science Foundation Engineering Research Center

Alumni Research Professor of Computer Science

Scientific Director, Quality of Life Technology Center

Former Director, Information & Intelligent Systems Division, NSF



Augmenting Human Capability & Performance

What are the science and engineering obstacles to be overcome to enable technology to compensate for debilitating human physical and mental conditions?

Victoria Zagaria /Intel Federal Healthcare

Alicia Anderson
Department of Housing and Urban Development (HUD)

Housing Program Manager
Section 202 Supportive Housing for the Elderly Program
Office of Housing Assistance and Grant Administration

How can technology be used to improve health outcomes, reduce health care utilization and postpone or delay institutionalization for poor elderly?

Neeraj Arora / NIH/NCI

Stephen M. Bauer, Ph.D.

National Institute on Disability and Rehabilitation Research

Project Officer

Expertise: Assistive and Universally Designed Technologies; Assistive Technology Service Provision; ICF Applications.

How might (why should) ICF language and concepts be used to characterize human needs
and associated technology (and other) solutions?

Margaret L. Campbell, Ph.D.
National Institute on Disability and Rehabilitation Research

Senior Scientist for Planning and Policy Support and
Lead NIDRR Subject Matter Expert for "Aging with Disability"

How can we better bridge knowledge across disciplines to coordinate the development and translation of promising practices and technology-based interventions that enhance the health and independence of adults who are both aging with long-term disabilities and those aging into disability and chronic disease in later life?

Elizabeth Cocke / HUD

Lawton Cooper / NIH/NHLBI

Theresa Cruz/ NIH/NICHD

National Institutes of Health

Program Officer
National Center for Medical Rehabilitation Research at the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development

How can we use technology to empower people with disabilities?

Theresa Cullen / VA Informatics

Sarah Domnitz/ IOM

Program Officer, Institute of Medicine
Forum on Aging, Disability and Independence

How can/will technology affect how we use the health care workforce? Will technology replace some of what health care workers do now?

INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES
Advising the nation • Improving health

Thomas Edes / VA

Jerome Fleg / NHLBI

Robert Hornyak / ACL/CDAP

Lyndon Joseph /NIA/ERP

Jonathan King / NIH/NIA/ERP

Allison Kumar / FDA/CDRH

Catherine Levy /NHLBI

Shari Ling / CMS

Dr. Shari Ling
Deputy Chief Medical Officer

Centers for Medicare and Medicaid Services
Shari.ling@cms.hhs.gov

What are outcomes are meaningful to achieve despite aging?

Leah Lozier
U.S. Dept. of Housing & Urban Development

Presidential Management Fellow

Office of Policy Development & Research
U.S. Department of Housing & Urban Development

How can we accommodate the needs of the low income elderly?

Keith Marzullo / NSF

Mary Ellen Michel / NCMR

Susan Miller / CMS

Sandra Mitchell / NIH/NCI

Research Scientist and Program Director
Outcomes Research Branch
Applied Research Program
Division of Cancer Control and Population Sciences
National Cancer Institute

Areas of scientific interest:

- Measurement of symptoms and functional status using patient-reported outcomes, performance-based measures, and sensor data
- Oncology telehealth models of care
- As a board certified nurse practitioner, I am also interested in technology implementation to enhance care delivery processes and evidence-informed clinical decision-making

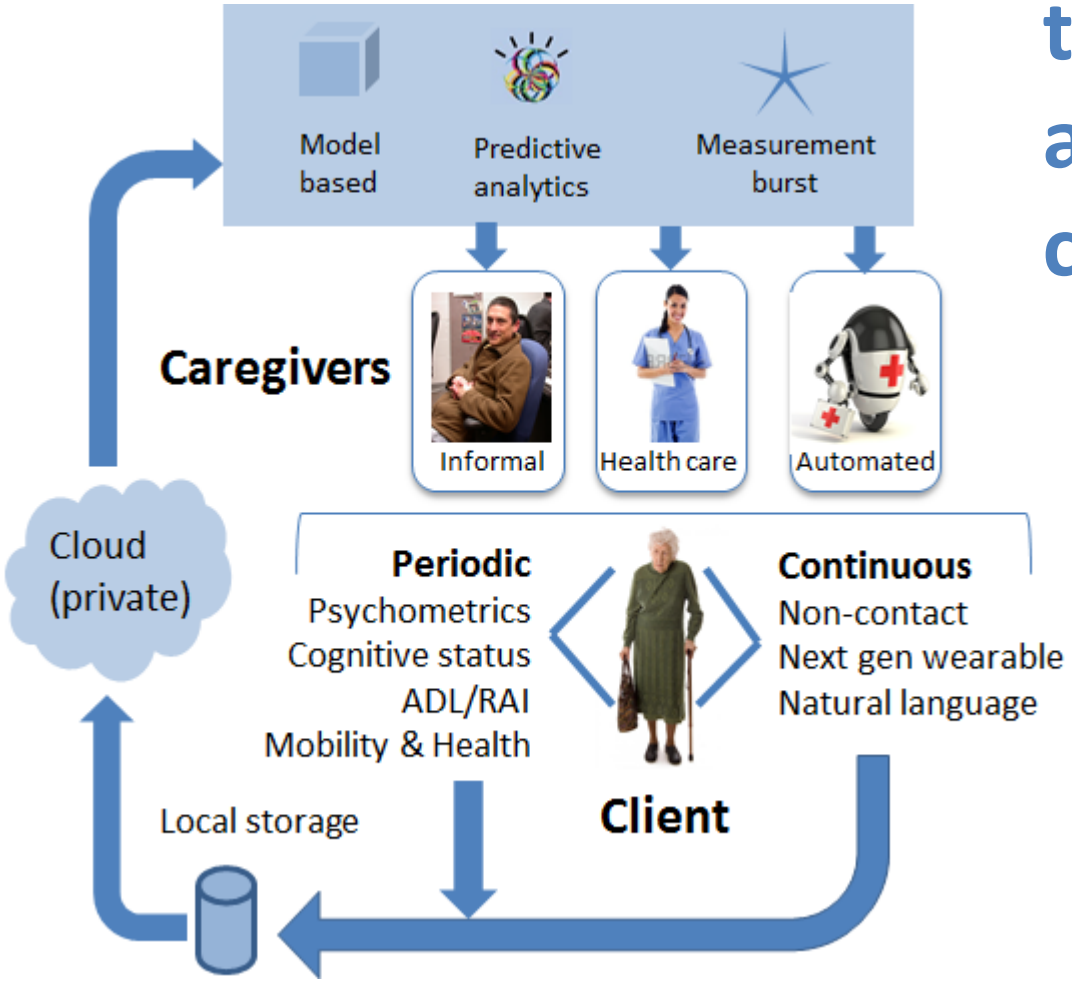
What technologies can be developed, adapted or deployed during and following cancer treatment to improve clinical outcomes and the patient experience for older, frail or vulnerable patients (including those with multimorbidity)?

Debra Sheets - UVIC gerontological nursing
Sandra Hundza - UVIC rehab neuroscience
Marc Klimstra - UVIC biomechanics
Stuart MacDonald - UVIC neuropsychology

Andrew R. Mitz
Laboratory of Systems Neuroscience
NIH/NIMH/DIRP

Yvonne Coady - UVIC analytics
Cheryl Beach - Island Health, B.C
Ravi Chacko - Washington University biomedical engineering

How do we develop a suite of technologies that will match the abilities of a human caregiver?



Populations

Island Health, B.C.

WWNMMC – Military (?)

Partnerships (evolving)

IBM – Analytics, Watson

Telus – Innovation center

ORCATECH (?)

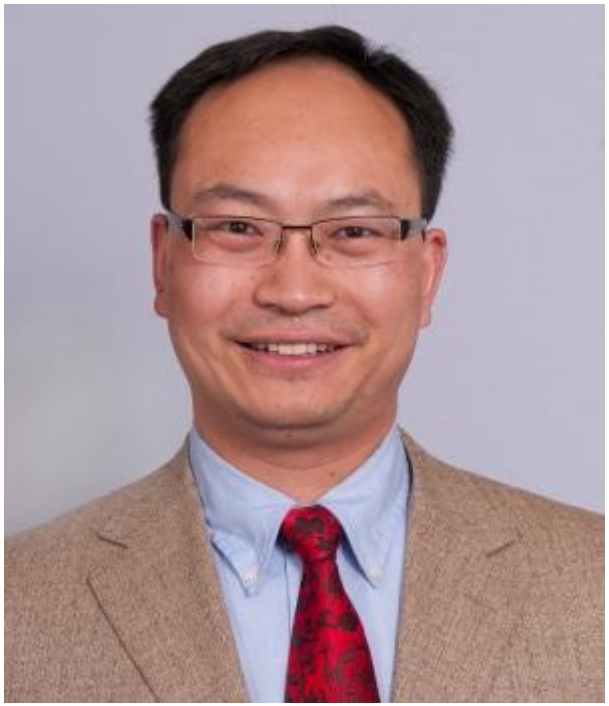
Andrew Pope / IoM

Louis Quatrano / NCMRR/NICHD/NIH

Matthew Quinn / FCC

Jamie Roberts / NIH/NINDS

Weisong Shi / NSF



- NSF: Managing the Computer Systems Research Program, SCH/CyberSEES
- WSU: Lead Wireless Health Initiative

How does computing technology advance aging problems? and what are the new computing challenges from aging applications?

Program Director @ NSF
Professor @ Wayne State University

Nina Silverberg / NIA

Carol Star / HUD

Erika Tarver/FNIH

Senior Project Officer
Foundation for the National Institutes of Health

How do we translate the research being done into a national platform model, that takes into account lessons learned from academia, government and the private sector?

Mary Weick-Brady/ FDA-CDRH

Center for Devices and Radiological Health
CDRH

Senior Policy Advisor
Center for Devices and
Radiological Health
Food and Drug Administration

How can we work with lay persons to assure their medical equipment is useful and usable to them on a regular basis?