with chronic conditions. Technology is touted as one tool to manage healthcare efficiently. However, human factors research has shown that technological systems that do not take human capabilities into account will fail to be adopted, or if adopted, will be abandoned by users. The Center for Research and Education on Aging and Technology Enhancement (CREATE) will describe research findings for four different facets of healthcare technology. Sara Czaja will provide an overview, describing technology for healthcare support. Caregiver needs are projected to rise rapidly, in part due to aging of the baby boom cohorts. We need new solutions for future generations of older adults as there will be insufficient numbers of caregivers to care for the increased number of older adults given changes in social structures. Wendy Rogers will discuss research on the design and use of televideo and robots to assist with healthcare. Neil Charness will discuss home monitoring technology, particularly practical issues around design, deployment, and maintenance, drawing on studies of heart failure patients and older adult controls. Walter Boot will discuss how gamification of healthcare interventions can help to address the adherence problem for behavior change. Scott Beach, Associate Director & Director of Survey Research Program, University Center for Social and Urban Research, University of Pittsburgh, will serve as discussant.

TECHNOLOGY FOR HOME MONITORING

Neil H. Charness[1], *1. Florida State University, Tallahassee, Florida, United States*

Healthcare is increasingly moving away from expensive hospitals into the home. Although there are advantages to managing chronic health conditions in homes, there are also a number of disadvantages, beginning with aging adults' unfamiliarity with the technologies being deployed. Too often, designs and instructional materials are not developed with aging users' capabilities in mind. Health technology also confronts users with significant challenges including just-in-time learning when users are under significant stress. Technology support is often lacking. Also, care coordination for multiple chronic conditions is challenging. For instance, patients are often provided with multiple electronic health record portals. I discuss the reliability of and some of the practical challenges for a home health monitoring system used by older adults and those with heart failure over a 6-month interval. The system featured components such as a wrist-worn sensor package, daily tablet surveys, blood pressure cuff, weight scale, and bed sensors.

THE HEALTHCARE CHALLENGE FOR AN AGING POPULATION: THE ROLE OF TECHNOLOGY

Sara J. Czaja[1], *1. Weill Cornell Medicine, New York, New York, United States*

Although many older adults enjoy relatively good health into their later years, many have one or more chronic conditions, diseases, or disabilities, and need help with disease management activities or activities important to independent living. With the increase in numbers of aging adults there is a concomitant strain on the healthcare system. Models of healthcare are also changing and moving towards a more partnership model where consumers are supposed to assume a more collaborative role in health decision making and a more active role in health management. This presentation will discuss the continuing and increasing role of technology in meeting the healthcare challenges for an aging population. The discussion will focus on technology applications to support the health and well-being of older adults as well as family caregivers. Challenges and barriers that currently limit the full potential of technology to be realized for these populations will also be discussed.

THE POTENTIAL AND PITFALLS OF GAMIFICATION TO SUPPORT OLDER ADULTS' ADHERENCE TO HEALTHCARE INTERVENTIONS

Walter R. Boot,[1] and Neil Charness[1], *1. Florida State University, Tallahassee, Florida, United States*

The addition of video game-like elements to non-game activities, known as gamification, holds promise with respect to encouraging engagement with, and adherence to, health behaviors and healthcare interventions. Elements of gamification include the introduction of points systems, leaderboards, achievement badges, stories and themes, rewards, progress tracking, and challenges. However, a lack of enthusiasm for, and experience with, video game play by older adults has important implications for the effectiveness of these techniques across the lifespan. Specifically, the age-related "digital divide" must be considered before applying these approaches to improving the wellbeing, cognition, and health of older adults. This talk will build on the body of research conducted by the Center for Research and Education on Aging and Technology Enhancement (CREATE) focused on gaming and interventions to present best practice guidelines for implementing gamification with older adults.

DESIGN AND USE OF ROBOTS TO ASSIST OLDER ADULTS WITH HEALTHCARE TASKS

Wendy Rogers,[1] and Megan Bayles[1], *1. University of Illinois Urbana-Champaign, Champaign, Illinois, United States*

There is much potential for robots to support the needs of older adults, in general, and particularly in healthcare. Older adults are quite open to the idea of interacting with robots, although they have preferences for the nature of the task they want the robot to do as well as what they want the robot to look like. These preferences should be considered in the process of design and deployment. Older adults should be involved throughout the design process from formative to summative evaluation and even beyond to the integration of the robot into their everyday activities. The extant research provides guidance regarding older adults' capabilities and limitations that might influence their ability to interact with a robot. Our goal in this presentation will be to focus on robots being designed to support older adults with healthcare tasks in the context of enhanced, instrumental, and basic activities of daily living.

SESSION 625 (SYMPOSIUM)

DNA METHYLATION: CAUSE OR CONSEQUENCE OF AGING?

Chair: Morgan E. Levine, *Yale University School of Medicine, New Haven, Connecticut, United States*
Co-Chair: Sara Hagg, *Karolinska Institutet, Stockholm, Sweden*

Epigenetic changes are one of the Hallmarks of Aging. DNA methylation is a key epigenetic mark that has been

shown to change during aging. Several "clocks" have been developed whereby changes in DNA methylation can be used to predict chronological, and perhaps, biological age. This symposium will focus on recent advances in understanding how and why changes in DNA methylation occur during aging and whether these changes play a causal role in age-related functional declines and disease.

A FUNCTIONAL EPIGENETIC CLOCK FOR RATS

Morgan E. Levine[1] Ross McDevitt,[2] Luigi Ferrucci,[2] and Rafael deCabo[2], *1. Yale University School of Medicine, New Haven, Connecticut, United States, 2. National Institute on Aging, Baltimore, Maryland, United States*

Evidence from humans suggests that incorporation of phenotypic aging measures in the development of epigenetic clocks leads to more functionally relevant biomarkers. As a result, the aim of this study was to utilize a deeply phenotyped rat cohort—that included data from rotarod, open field, frailty index, and FACS—to generate a novel epigenetic clock. DNA methylation was assessed via reduced representation bisulfite sequencing (RRBS) for n=142 male Fischer rats from NIA aging colony, ranging in age from 1 to 27 months. Phenotypic traits were combined to generate an multi-system aging measure that was then used to train the epigenetic clock. Using an independent validation sample, age-adjusted epigenetic clock measures were associated with numerous traits, including: open field time resting (p=0.005), open field time climbing (p=0.001), body weight (p=0.02), and rotarod max (p=0.04). In moving forward, it will be important to examine cross-species comparisons, longitudinal change, and functional enrichment.

LONGITUDINAL TRAJECTORIES OF EPIGENETIC CLOCKS IN HUMANS AND EFFECTS OF MEDICATION USE

Sara Hagg[1], *1. Karolinska Institutet, Stockholm, Sweden*

We sought to investigate the longitudinal trajectories of the new generation epigenetic clock´s and how medication use is altering the DNA methylation age (DNAmAge). DNA methylation (Illumina 450k and EPIC) was assessed repeatedly up to six times (1992-2014) in whole blood (597 individuals, 1469 samples) from the Swedish Adoption/Twin Study of Aging (SATSA). DNAmAges were generated with the online calculator. Mean age at first measurement was 67 years (58% women). All clocks tested (Horvath, Hannum, Pheno, Grim, Skin&Blood) were correlated with chronological age (ρ=0.62-0.80). The steepest slope was found for Pheno while Horvath had the least steep slope. Correlations between the clocks ranged ρ=0.43-0.75. About 15% of the individuals started statin treatment during the follow-up, which changed the slopes to be less steep. Co-twin control analyses were confirmatory. Different DNAmAges are strongly correlated with each other in a longitudinal perspective. Treatment effects may alter the slopes of the DNAmAges.

EPIGENETIC PREDICTORS OF LIFESPAN AND HEALTHSPAN

Ake T. Lu[1] and Steve Horvath[2], *1. Department of Human Genetics, University of California, Los Angeles, Los Angeles, California, United States, 2. Department of Human Genetics, UCLA, LOS ANGELES, California, United States*

Capturing aspects of biological age, DNA methylation based biomarkers collectively known as "epigenetic clock" can be used to measure the age of any human tissue, cell type, or fluid that contains DNA. Arguably the strongest predictor of lifespan, DNAmGrimAge, is a composite biomarker comprised of DNAm-based surrogates of plasma proteins and a DNAm-based estimate of smoking pack-years. Large-scale validation studies demonstrate that DNAmGrimAge stands out among existing epigenetic clocks when it comes to predicting time-to-death (P=2.0E-75), time-to-coronary heart disease (P=6.2E-24), and its strong relationship with computed tomography measures of fatty liver, and age-at-menopause (P=1.6E-12). DNAm-based estimates of plasma proteins and telomere length (TL) are attractive as well. For example, a DNAm based estimate of Plasminogen Activator Inhibitor 1 strongly relates to multi-morbidity and a DNAm based estimate of TL outperforms actual TL measurements in predicting lifespan. Overall, these epigenetic biomarkers are expected to find many applications including human anti-aging studies.

ROBUST BIOMARKERS OF AGING AND THEIR BIOLOGICAL ORIGIN

Dmitriy Podolskiy,[1] Dmitriy Podolskiy,[1] and Vadim Gladyshev[1], *1. Brigham & Women's Hospital, Boston, Massachusetts, United States*

The biological origin of impressive accuracy of DNA methylation clocks, the most precise currently available biological markers of aging in humans and model animals, remains largely unclear. In addition, they sometimes suffer from uncontrollable precision loss out of sample. To address these two issues, we develop a novel method for constructing robust molecular markers of age based on network analysis of age-dependent omics data. The newly developed robust markers of aging in yeast, fruit fly, mouse and human are nearly free of batch effects and have a transparent biological nature related to tight control of translation-related processes and their disregulation associated with aging.

SESSION 630 (SYMPOSIUM)

HARNESSING THE POWER OF A GERIATRIC EXERCISE NETWORK TO IMPROVE HEALTH: THE VA GEROFIT WAY

Chair: Katherine S. Hall, *Durham Veterans Affairs Health Care System, Durham, North Carolina, United States*
Discussant: Janet Prvu-Bettger, *Duke University School of Medicine, Durham, North Carolina, United States*

The Gerofit Consortium is a clinical and research network that naturally evolved from the dissemination of a VA "Best Practice" exercise and health promotion program for older Veterans. Originally developed in the Durham VA, Gerofit has been disseminated to 15 VA Medical Centers using a successful "collaboratory" team network approach. This group has met regularly (biweekly) for five years; starting with four newly disseminated programs in 2014 and adding 2-3 new programs per year since, following a structured implementation process. We have learned that the sum is much greater than the parts. Each program shares important experiences and contributes to development