8:30 AM - 12:00 PM

Note Taking and Thinking Tools with Obsidian

John Lee
Joonbum Lee

Integrating information from books, articles, web sources, and daily experience presents a substantial challenge for students, researchers, and practitioners. The accelerating pace of scientific and technological development accentuates this challenge. To meet this challenge requires tools for thinking. Such, tools have been used for centuries, but the last few years have produced a rapid proliferation of powerful digital note-taking tools. These tools are not just for creating and storing notes, but they can also use data analytics to amplify our thinking.

The workshop provides a brief historical and theoretical background of thinking tools. It then surveys several recent note taking tools before providing an in-depth, hands-on tutorial with Obsidian. Obsidian is a particularly powerful and flexible software that supports traditional and emerging ways to organize notes. This tutorial walks participants through the installation, configuration, and customization of Obsidian. The tutorial then describes how various organizing mechanisms (i.e., folders, tags, and links) can be used to meet the particular needs of the participants. Different structures can afford storing content, sparking new ideas, and supporting writing. The workshop will touch on other applications of Obsidian, such as coding qualitative data, conducting work domain analysis, and capturing code snippets for data analysis. We hope this tutorial will be particularly useful for those beginning a career in human factors research.

1:30 PM - 5:00 PM
Trust, Implications, & Measurement

Theresa Kessler
Tracy Sanders
Alexandra Kaplan

Appropriately calibrated human trust is essential for optimal human-machine system performance. Various aspects of the machine may influence the human-machine trust relationship, including who developed and assembled it, its behaviors and attributes, and the information it provides. The human users' predispositions and perceptions, as well as behaviors from other humans within a system can also influence the trust relationship. Importantly, trust in the information provided by a machine affects overall shared performance.

Materials covered in this workshop will include definitions and descriptions of various types of trust, with a focus on trust calibration. Cognitive bias will be reviewed and its relationship to trust explained. Measurement methods will be discussed with examples provided. Participants will learn which factors contribute to human-human, human-robot, human-AI, and human-automation trust, how these types of trust are similar, and how they differ. In addition, we will demonstrate how these concepts interact,

with a strong focus on how human-human trust is related to human-systems trust. The impact of cognitive biases and shortcuts on trust calibration will be discussed. Through a hands-on exercise, participants will explore how various features can influence trust calibration. In a separate exercise, participants will identify commonly used methods of information presentation designed to manipulate trust using cognitive bias and shortcuts.

No knowledge or expertise is needed to attend the workshop (beginners and novices). The purpose of this workshop is to introduce the topic of trust to practitioners interested in measuring trust, how it influences system development, and how it can be manipulated. Handouts will be provided.

8:30 AM - 12:00 PM
Understanding and Applying the Human Readiness Level (HRL) Scale

Judi See
Pamela Savage-Knepshield
Holly Handley
Mica Endsley

This three-hour workshop supports knowledge and application of the Human Readiness Level (HRL) scale described in ANSI/HFES 400-2021 Human Readiness Level Scale in the System Development Process. The HRL scale is a simple nine-level scale designed to supplement the Technology Readiness Level (TRL) scale in order to evaluate, track, and communicate the readiness of a technology or system for safe and effective human use. Application of the HRL scale ensures proper attention to human systems design throughout system development, which minimizes or prevents human error and enhances the user experience.

Learning objectives for the workshop include:

1. Understand HFES 400-2021 development and contents - Instructors will describe evolution of the HRL concept to convey its significance and the rigor behind development of the technical standard. Instructors will walk through major sections of the standard and describe how to apply them.
2. Learn how the HRL scale is applied in current and historical acquisition programs - Instructors will describe real-world Army applications of the HRL scale, including a case study of a software modernization program.
3. Apply the HRL scale to practical real-world problems - Students will gain hands-on experience applying the HRL scale during group exercises that simulate teamwork during the system development process. Group exercises incorporate three different scenarios representing both hardware and software solutions at various stages of technological development. The hands-on exercises specifically address common questions regarding practical use of the HRL scale.

Workshop attendees do not need prior HF/E knowledge or expertise. The HRL scale is intended to be applied by human systems professionals with appropriate expertise and experience; however, recipients of HRL scale ratings include many other types of personnel in design, engineering, and acquisition as well as high-level decision makers, all of whom benefit from understanding the role of the HRL scale in the system development process. Before attending the workshop, students should download a free

copy of the ANSI/HFES technical standard at https://my.hfes.org/online-store/publications and bring it to the workshop in electronic or hard copy format. Laptops are not necessary for the workshop but may facilitate notetaking and completion of the group exercises.

1:30 PM - 5:00 PM
Getting Support Right: A Practical Introduction to Work-Centered Evaluation

Ann Bisantz
Emilie Roth
Xiaomei Wang
A. Zachary Hettinger

Evaluation is a critical element of system development, to establish that a designed system meets operational objectives. New technologies are often introduced with the promise that they will improve performance. In the cognitive engineering tradition, these expectations are treated as hypotheses that need to be tested. Robust user testing is required to establish whether the hypothesized benefits are realized, to identify unsupported aspects of performance, as well as to reveal unanticipated side-effects of introducing the new technology that need to be addressed. This need is particularly important in evaluating systems which support high-consequence, cognitively demanding work in environments characterized by both risk and uncertainty.

This workshop will introduce attendees to a robust method of system evaluation, Work-Centered Evaluation, that has been developed and refined through the design and evaluation of aiding systems in domains including military command and control, and health care. The methodology includes evaluations of the underlying model of work support as well as the surface features of the interface, through in-depth, scenario-based testing with actual domain practitioners that are the target users. This workshop will present the conceptual framework of work-centered evaluation and situate it within cognitive engineering and usability methods.

The methodology will be motivated using system design examples from several domains including military mission planning and health information technology. Specific elements of the framework (cognitive analyses, model of support, work-based scenarios, measures) will be defined and examples provided using case studies. Participants will practice developing these components in a small group, participatory exercise. This workshop is of interest to human-system designers and practitioners seeking to enhance the information gained through usability analyses, as well as those involved in procuring or evaluating systems who would like to better understand criteria for evaluation from an HSI perspective. Only a general familiarity with usability assessment/system evaluation is needed to learn about the approach; however, participants with more advanced knowledge of cognitive engineering methods will gain more in-depth insights regarding the application of cognitive engineering models in the evaluation development. Participants should have paper/pen or a device for notetaking. Having a device (computer/tablet/phone) will be helpful for the hands-on sessions.

8:30 AM - 12:00 PM
Agile Product Management for Human Factors Professionals

Chris Lamb

Many Human Factors professionals participate in the design and development of software. The HF professionals focus on the interaction between the user and the software is a natural fit for modern software development practices like Agile that also focus on the value delivered to the user through the software product. When working in Agile development teams many HF professionals will be pushed towards the user experience roles and designing the interface. While HF is very interested in user experience, I will discuss how the role of Product Management is a closer fit to the HF skill set.

At its heart, Agile Software Development is based on the same scientific methods of test and verification that Human Factors professionals use in their research. By understanding the connections between developing a scientific research portfolio and developing a product, the Human Factors professionals can reframe how they view Agile development and their role in guiding the product. This workshop will teach the basics of agile product management with a focus on maximizing the overlap of Human Factors and product management. By the end of the workshop, participants will have a better understanding of the value they bring to an agile organization and how to begin leading product development teams.

9:00 AM - 4:30 PM

Conceptualizing and Preparing HFES-relevant Interdisciplinary NSF Proposals

Leia Stirling
Divya Srinivasan
Betty Tuller

In this workshop, participants will be introduced to topics to support effective proposal writing for the National Science Foundation (NSF). Information from about relevant programs (e.g., the Mind, Machine, and Motor Nexus (M3X), Future of Work at the Human-Technology Frontier (FW-HTF)) will be presented.

Topics will include developing the structure of an NSF proposal, building concepts, creating an evaluation plan, and writing to align with one's selected program. The workshop will include hands-on activities to practice these concepts through simulated panel reviews of example proposals. No prior grant writing experience is required. While the workshop is targeted towards junior faculty and aspiring faculty, all are welcome.

9:00 AM - 4:30 PM

Workshop on Applying Model-Based Systems Engineering in Human Systems Integration

Michael Miller
John McGuirl
Joseph Kristabum

Model Based Systems Engineering (MBSE) is being applied across the Department of Defense and Industry to improve the speed and robustness of engineering design and development. These models serve as the authoritative source when understanding the requirements, structure, and behavior of systems. While the languages, methods, and tools used in MBSE practices were designed with a software and hardware focus, these languages, methods, and tools can be readily adapted to include human-related information to aid system specification and communication which can benefit human operators, maintainers, and users.

This workshop is designed to provide attendees with an overview of the Systems Modeling Language, one of the more common MBSE languages, common modeling methods and a common modeling tool. Examples of human representations will be provided. Attendees will understand how MBSE is used to depict systems and how to interpret common modeling artifacts, be able to apply these tools to represent human interaction in MBSE models and analyze the utility of these models for understanding the robustness of human-machine interfaces and interactions.

9:00 AM - 4:30 PM

Behavioral Data Analytics with R

John Lee
Linda Boyle
Tony McDonald

Data analytics, machine learning, and the increasing demand for experts in quantitative user experience present challenges and opportunities for behavioral scientists and human factors engineers. Data analytics and machine learning draw on techniques that are unfamiliar to many behavioral scientists, but data scientists may be unfamiliar with many important features of behavioral data. This workshop provides practical skills in behavioral data analytics and also addresses important issues specific to behavioral data. Participants will learn data manipulation and visualization techniques. They will apply these techniques to exploratory data analysis, machine learning, and model understanding. The workshop includes exercises and examples using the statistical package â€œRâ€• that include: complex data reduction, creation of machine learning models, selection of cross-validation techniques suited to behavioral data, and visualization of predictions, and techniques to make models understandable. The workshop also includes a survey of machine learning techniques, such as text analysis, and resources in R.