INTERNATIONAL AUTUMN SCHOOL
COGNITIVE INTERFACES

OCTOBER 8–11, 2019
BLACK FOREST, GERMANY

WELCOME!

The 3rd International Autumn School "Cognitive Interfaces" of the Leibniz-WissenschaftsCampus Tübingen will be held from October 8–11, 2019 in the Black Forest, Germany. Early career researchers are invited to engage in four days of intensive discussion and hands-on sessions on the challenges and potentials of digital technologies for the execution of knowledge-intensive activities such as complex decision making, or self-regulated learning.

The Autumn School addresses empirically oriented Ph.D. students and post-doctoral researchers within three years after receiving their Ph.D. in the fields of psychology, computer science, social sciences (e.g., communication science, sociology, education science), or medicine, dealing with questions in the field of digital technologies. The Autumn School presents a unique opportunity to meet fellow researchers and learn from outstanding scientific leaders by developing new research ideas.

Across two parallel workshop tracks (about 12 participants each), the Autumn School provides a place to explore, discuss and reflect, share ideas and gain insights into the complex interplay of digital technologies and human interaction.

Foto: Ganzer Studios

The Autumn School will take place at "Lautenbachhof" in Bad Teinach, Black Forest, Germany.
www.lautenbach-hof.de

The Leibniz-WissenschaftsCampus "Cognitive Interfaces"

The Leibniz-WissenschaftsCampus "Cognitive Interfaces" is an interdisciplinary research network of the Leibniz-Institut für Wissensmedien (IWM) and the University of Tübingen. The University of Stuttgart is associated. Within this network, researchers from various disciplines such as psychology, computer science, education, and medical fields conduct research on the design of what we call "cognitive interfaces".

Cognitive Interfaces

The development of information and communication technologies has made enormous progress in the 21st century. They have created an interface which makes access to an enormous variety of information possible in real time. They create an interface which supports how we think, what we know, how we make decisions and how we behave – in this sense it is a cognitive interface, in that it can collaboratively support people's cognitive processes. Interfaces are also in a second sense cognitive interfaces, in that they themselves increasingly demonstrate characteristics of cognitive systems. They are increasingly adaptable, draw inferences and thus "participate" to some extent in social and cognitive processes. The potential of digital technologies is especially promising in knowledge-intensive activities – these can be in learning contexts or in professional use. How do these interfaces need to be designed to encourage optimal knowledge acquisition, understanding and exchange, as well as optimal decision-making and problem-solving? This is one of the leading questions addressed by the Autumn School "Cognitive Interfaces".

Please visit
https://autumnschool.wissenschaftscampus-tuebingen.de
for up-to-date information and details concerning
registration, venue and organization.

PROGRAM // ABSTRACTS

Tuesday, October 8, 2019

Welcome Day and Keynote presentations

Wednesday, October 9, 2019 and
Thursday, October, 10, 2019

Workshop Track 1 and 2 in parallel sessions:

TRACK 1 – DIGITAL TECHNOLOGY IN MEDICINE // Vimla L. Patel & Edward H. Shortliffe

Digital technology holds promise for improving healthcare, but also has numerous challenges at the interface between computing devices and health professionals. These challenges are compounded by the complex nature of healthcare and the lack of empirical evidence to validate the impact of these technology on health professionals' reasoning and decision making about patient problems. Principles of cognitive science and human-computer interaction [HCI], together with the development of data analytical methods, can provide insights into the nature of such interfaces. In this workshop we will discuss the challenges, identify the knowledge gaps, develop hypotheses, and design laboratory-based and real-world studies in the context of complex clinical workflow. Prior experience with medical systems will not be required for those who participate. We will focus on cognitive, social, and organizational issues that influence clinical decision making and may compromise patient safety.

TRACK 2 – COGNITIVE OFFLOADING // Evan F. Risko

Achieving our day-to-day cognitive goals is enabled through interactions between the mind on the one hand and the body (e.g., gesture) and physical artefacts (e.g., computers) on the other (Risko & Gilbert, 2016). One important class of this kind of distributed cognition is cognitive offloading – the use of the body and/or physical artefacts to alter the information processing requirements of a task in order to reduce cognitive demands. For example, we often offload memory demands by storing information externally (e.g., in a computer file). Despite the (arguably increasing) ubiquity of this class of behavior, there has been limited research conducted to date investigating it which means that we have much to learn about it. In this track we will explore a number of unanswered questions about cognitive offloading and its broader applications.

Friday, October 11, 2019

Final presentation of results and summary on Autumn School

KEYNOTE SPEAKERS // WORKSHOP LEADERS
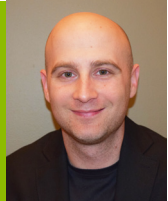
Evan F. Risko, PhD

University of Waterloo, Canada

https://uwaterloo.ca/psychology/people-profiles/evan-f-risko

Evan F. Risko received his PhD from the University of Waterloo in 2008. He then held a Killam Postdoctoral Fellowship at the University of British Columbia before taking up Assistant Professor positions at Arizona State University, the University of Memphis then the University of Waterloo, where he is currently an Associate Professor, head of the Cognitive Area, and the Canada Research Chair in Embodied and Embedded Cognition in the Psychology Department. His research focuses on providing a deeper understanding of how we use our body and physical environment to help us think and how this coupling ultimately shapes our thinking. The broad nature of this problem leads him to address issues in many areas including attention, metacognition, cognitive control, memory, human-computer interaction, and decision making. He is also interested in using research in cognitive psychology to help improve practices in education. Dr. Risko has published over 80 papers and received funding from the Natural Sciences and Engineering Research Council, the Social Sciences and Humanities Research Council, the Canadian Foundation for Innovation, the Canada Research Chairs Program and the Province of Ontario. Dr. Risko has received various accolades for his research including Early Career awards from the Psychonomic Society and the Canadian Society for Brain, Behaviour and Cognitive Science.

Vimla L. Patel, PhD, DSc, FRSC

**Center for Cognitive Studies in Medicine and Public Health,
The New York Academy of Medicine, New York, USA**

http://ccsmph.nyam.org

As Professor of Medicine and the director of McGill University's Center for Medical Education in Montreal, her early research focused on scientific foundations for medical and health education, particularly cognitive foundations of medical decision-making and reasoning. Vimla Patel led the field of research on application of cognitive science principles to investigation of the nature of reasoning and thinking of health care professionals, with support from the Canadian Medical Research Council. The findings from these studies impacted medical schools showing training alone to be insufficient unless supported by education to encourage flexibility and adaptation. As director of the Center for Cognitive Science in Graduate studies in Research at McGill University, she developed and leads the cognitive science research and training programs for 3 years, bridging psychology, linguistics, education, to Artificial Intelligence.

She is currently a Senior Research Scientist and the Director of the Center for Cognitive Studies in Medicine and Public Health at the New York Academy of Medicine. She is a Professor of Biomedical Informatics (BMI) at Arizona State University in Arizona, and adjunct professor of BMI at Columbia University, and of Public Health at Weill Cornell College of Medicine in New York. An elected fellow of the Royal Society of Canada (Academy of Social Sciences), the American College of Medical Informatics, the International Academy of Health Science Informatics, and the New York Academy of Medicine, she is a recipient of a number of federal research grants in the US. As a graduate of McGill University in Montreal in 1982, she received an Honorary Doctor of Science degree from the University of Victoria in Canada. Vimla Patel served as a member of Institute of Medicine and the National Research Council committees related to social science, education and health Information technology research. She is an associate editor of the Journal of Biomedical Informatics and sits on the editorial boards of Artificial Intelligence in Medicine and Advances in Health Science Education. Her research focuses on medical decision making, medical cognition, medical errors, the impact of technology on human cognition, and resulting insights on designing an efficient and safer clinical workplace. Of particular interest and the focus of her research is on how people process, integrate and visualize data with different types, scales, and temporal characteristics as they build mental models for making their decisions. She has published around 300 scholarly peer-reviewed articles spanning biomedical informatics, education, clinical, and cognitive science journals. Vimla Patel has mentored 34 master's students, 23 doctoral students, and 20 post-doctoral and research fellows in her 28-year career.

Edward H. Shortliffe, MD, PhD

**Adjunct Professor of Biomedical Informatics
(Columbia, Arizona State, and Cornell Universities)**

http://www.shortliffe.net

Edward H. Shortliffe is Adjunct Professor of Biomedical Informatics at Columbia University's College of Physicians and Surgeons and at the College of Health Solutions at Arizona State University. He is also Adjunct Professor of Healthcare Policy and Research (Health Informatics) at Weill Cornell Medical College and a Senior Executive Consultant to IBM Watson Health. Previously he was a Scholar in Residence at the New York Academy of Medicine (2012–2016) and served from July 2009 through March 2012 as President and Chief Executive Officer of the American Medical Informatics Association (AMIA), headquartered in Bethesda, MD. From November 2009 until October 2011 he held a position as Professor in the School of Biomedical Informatics at the University of Texas Health Science Center in Houston. Between 2007 and 2009 he was Professor of Biomedical Informatics at Arizona State University and Professor of Basic Medical Sciences and Professor of Medicine at the University of Arizona College of Medicine. He served as the founding dean of the Phoenix campus of the University of Arizona's College of Medicine from 2007–2008. Before that he was the Rolf A. Scholdager Professor and Chair of the Department of Biomedical Informatics at Columbia College of Physicians and Surgeons in New York City (2000–2007) and Professor of Medicine and of Computer Science at Stanford University (1979–2000).

After receiving an A.B. in Applied Mathematics from Harvard College in 1970, he moved to Stanford University where he was awarded a Ph.D. in Medical Information Sciences in 1975 and an M.D. in 1976. During the early-1970s, he was principal developer of the medical expert system known as MYCIN. After a pause for internal medicine house-staff training at Massachusetts General Hospital and Stanford Hospital between 1976 and 1979, he joined the Stanford internal medicine faculty where he served as Chief of General Internal Medicine, Associate Chair of Medicine for Primary Care, and was director of an active research program in clinical information systems and decision support. He spearheaded the formation of a Stanford graduate degree program in biomedical informatics and divided his time between clinical medicine and biomedical informatics research. In January 2000 he moved to Columbia University, where he was also Deputy Vice President (Columbia University Medical Center) and Senior Associate Dean (College of Physicians and Surgeons) for Strategic Information Resources, Professor of Medicine, Professor of Computer Science, and Director of Medical Informatics Services for the NewYork-Presbyterian Hospital. He continues to be closely involved with medical education and biomedical informatics graduate training. His research interests include the broad range of issues related to integrated decision-support systems, their effective implementation, and the role of the Internet in health care.

CONTACT

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