The National Academies of
SCIENCES • ENGINEERING • MEDICINE

DIVISION OF BEHAVIORAL AND SOCIAL SCIENCES AND EDUCATION

Board on Behavioral, Cognitive, and Sensory Sciences

Workshop 1: "What Are Ontologies and How Are They Used in Science?" Presenter Biographical Sketches

David Danks is the L.L. Thurstone Professor of Philosophy & Psychology, and head of the Department of Philosophy, at Carnegie Mellon University (CMU). He is also the chief ethicist of CMU's Block Center for Technology & Society; co-director of CMU's Center for Informed Democracy and Social Cybersecurity (IDeaS); and an adjunct member of the Heinz College of Information Systems and Public Policy, and the Carnegie Mellon Neuroscience Institute. His research interests are at the intersection of philosophy, cognitive science, and machine learning, using ideas, methods, and frameworks from each to advance our understanding of complex, interdisciplinary problems. He has examined the ethical, psychological, and policy issues around AI and robotics in transportation, healthcare, privacy, and security. He has also done significant research in computational cognitive science, culminating in his Unifying the Mind: Cognitive Representations as Graphical Models (2014, The MIT Press, and he has developed multiple novel causal discovery algorithms for complex types of observational and experimental data. He is the recipient of a James S. McDonnell Foundation Scholar Award, as well as an Andrew Carnegie Fellowship.

Example relevant publication: Goal dependence in scientific ontology (2015), http://www.andrew.cmu.edu/user/ddanks/papers/GoalsOntology-Preprint.pdf

Russell A. Poldrack is the Albert Ray Lang Professor in the Department of Psychology and professor (by courtesy) of computer science at Stanford University, and Director of the Stanford Center for Reproducible Neuroscience. His research uses neuroimaging to understand the brain systems underlying decision making and executive function. His lab is also engaged in the development of neuroinformatics tools to help improve the reproducibility and transparency of neuroscience, including the Openneuro.org and Neurovault.org data sharing projects and the Cognitive Atlas ontology.

Example of relevant publication: Cognitive Ontologies for Neuropsychiatric Phenomics Research, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2752634/

Deborah L. McGuinness is a computer scientist and professor at Rensselaer Polytechnic Institute where she holds an endowed chair in the Tetherless World Research Constellation. She works in the field of artificial intelligence, specifically in knowledge representation and reasoning, description logics, the semantic web, explanation, and trust. She was recognized by AAAS for outstanding contributions and leadership in the areas of ontologies, semantic web, eScience, open data, and semantic data resourced. She leads the Stanford Inference Web (IW) effort. IW provides a framework for increasing trust in answers from heterogeneous systems by explaining how the answers were derived and what they depended on. Inference Web supports this goal by providing infrastructure and an implemented web-based environment for storing, exchanging, combining, annotating, comparing, search for, validating, and

rendering proofs and proof fragments provided by reasoners and query answering systems. She has also co-authored the World Wide Web Consortium's recommendation for an Ontology Web Language (OWL) and provenance language (PROV) recommendations.

Example relevant publication: Ontology Development 101: A Guide to Creating Your First Ontology, https://corais.org/sites/default/files/ontology_development_101_aguide_to_creating_your_first_ontology.pdf

Thomas R. Insel, founder and president of Mindstrong Health, is a psychiatrist and neuroscientist. He previously served as Director of the National Institute of Mental Health (NIMH), the component of the National Institutes of Health (NIH) committed to research on mental disorders. Most recently he led the Mental Health Team at Verily. Prior to his appointment at the NIMH, he was a professor in the Department of Psychiatry and Director of the Center for Behavioral Neuroscience at Emory University School of Medicine. He also served as Director of the Center for Autism Research and is a member of the scientific advisory board at the Autism Science Foundation. He is a member of the National Academy of Medicine and has received numerous national and international awards including honorary degrees in the U.S. and Europe.

Benjamin B. Lahey is the Irving B. Harris Professor in the Departments of Health Studies and Psychiatry and Behavioral Neuroscience at the University of Chicago. He is known for his research on psychological problems in children, adolescents, and adults such as ADHD and antisocial behavior and he was a member of a scientific panel that constructed the current definition of ADHD in the 1990s. He was one of the authors of the papers that first hypothesized a hierarchical organization of dimensions of psychological problems, with a general factor at the top of the hierarchy. He is a fellow of the American Psychological Association and the Association for Psychological Science. He is also a member of both the International Society for Research in Child and Adolescent Psychopathology and the Society of Clinical Child and Adolescent Psychology, as well as a former president of both organizations.

Bruce Cuthbert coordinates the NIMH Research Domain Criteria (RDoC) project to develop neuroscience-based criteria for studying mental disorders. He assumed a position as Director of the NIMH's new RDoC Unit, following five years as Director of the Division of Adult Translational Research and Treatment Development (DATR). He returned to NIMH in following four years as a professor of clinical psychology at the University of Minnesota. He previously served as Chief of the Adult Psychopathology Research Branch at NIMH, after seventeen years on the faculty at the University of Florida. He is known for his research on the psychophysiology of emotion, and translational research on the psychopathology of anxiety disorders.

Uma Vaidyanathan is Research and Innovation Manager for the Research Domain Criteria (RDoC) initiative at the National Institute of Mental Health (NIMH). She has over a decade of experience in behavioral neuroscience, programming, and statistics. Her research focuses on fusing these methods to map the boundaries of normal and abnormal human behavior, and the philosophy of science, and measurement and classification issues underlying this work. She is currently a Presidential Leadership

Scholar with the George W. Bush and Clinton Foundations, and the NIMH representative and facilitator for the SNOMED international healthcare terminology's Mental and Behavioral Health Clinical Reference Group. She also serves as a member of the Wellcome Trust's Mental Health Priority Area's Strategic Advisory Board and is on the Board of Trustees of Mental Health Innovations, a digital mental health charity founded by the Royal Foundation of the Duke and Duchess of Cambridge.