

Symposia

Rumelhart Prize Symposium: Graded, Distributed, and Interactive: How Parallel Distributed Processing Has Influenced Cognitive Science.

Friday, August 13, 10:00 – 11:30 p.m.

This symposium honors the career of James L. McClelland, winner of the 2010 Rumelhart Prize. When Jay entered the field, cognitive science looked very different: representations and processes were thought to be modular, independent, symbolic, and discrete, and the discipline proceeded independently from neuroscience. Through computational modeling, elegant empirical studies, and close attention to neuroscience, Jay's work contributed to an alternative view: that cognitive representations are graded and not discrete; that representations and processes are highly distributed and non-modular; that cognitive processes are highly interactive and not functionally independent; and that information about the brain importantly constrains theories of cognitive functioning. This symposium illustrates how these themes have shaped current thinking in influential research on the graded nature of sublexical representations, the interactive nature of language comprehension and perception, the distributed nature of neural representations revealed by multi-voxel pattern analysis, and the functional and neuroanatomical organization of the semantic system.

Timothy T. Rogers, Bruce Hayes, Michael Spivey and Nikolaus Kreigeskorte

Invited Symposium 1: Abductive Reasoning: Inferring Explanations.

Friday, August 13, 10:00 – 11:30 p.m.

The American philosopher Charles Peirce used the term abduction to describe inference to explanatory hypotheses, including both the initial generation of hypotheses and their evaluation, which is now commonly called inference to the best explanation. This symposium will discuss current interdisciplinary work on abduction, including research in artificial intelligence and linguistics (Hobbs), psychology (Lombrozo), philosophy (Magnani), and computational neuroscience (Thagard).

Paul Thagard, Jerry Hobbs, Tania Lombrozo, and Lorenzo Magnani.

Invited Symposium 2: Balancing Internal and External Cognition: A Learning Process.

Friday, August 13, 10:00 – 11:30 p.m.

Human cognition is able to accomplish amazing feats, even though it has to deal with limited cognitive resources. A solution to dealing with cognitive limitations is to outsource as much as possible to the outside world: instead of relying on representations in the head we rely on representations in the world. In this symposium we will examine the relationship between information in the head and in the world, and how to optimize it. This can be in terms of finding the optimal division of labor between internal and external, to examine learning processes that converge to such an optimal solution, to study how external representations can lead to optimal teaching solutions, and how good performance in multitasking can be related to internal and external control.

Niels Taatgen, Wai-Tat Fu, Ken Koedinger, and Andrew Howes.

The following symposia are listed in the order in which they were presented:

Success in the Theory of Mind

Thursday, August 12, 10:30 a.m. – 12: 00 noon.

Peter wants to get the beer he left in the refrigerator. Predicting Peter's behavior correctly is usually an easy matter, but understanding how people correctly predict his behavior with ease is a much more difficult task. Thirty years of research on theory of mind has focused on the interesting few cases in which fail to reason about mental states correctly. However, it is perhaps more interesting to explore the common, reliable cases of successful theory of mind reasoning. This symposium presents cutting-edge research using several different experimental approaches to studying the processes involved in successful instances of theory of reasoning, as well as the processes involved in developing the ability to succeed consistently across the life span. In this symposium, research employing a variety of measures – with toddlers, preschoolers, school-age children, and adults – takes aim at current debates central to the field and delivers weighty results.

Rose Scott, Adam Petrashek, Noah Goodman, Adam Cohen, Rebecca Saxe, Renee Baillargeon, Ori Friedman and Tamsin German

Prospective Perception

Thursday, August 12, 12:00 noon – 1:30 p.m.

Recent data indicate that perception is inherently prospective (i.e., anticipatory). The purpose of this symposium is to examine the research of three scholars who approach prospective perception from three different theoretical perspectives: the Theory of Event Coding, the Economy of Action theory, and the Ecological Theory. The panelists will examine differences among these theories and address the extent to which prospective perception research affords a means of potentially integrate these three theories.

Jerome S Jordan, Jessica Witt and Michael Riley

The Philosophy of Affective Neuroscience

Thursday, August 12, 1:30 – 3:00 p.m.

This panel showcases the interdisciplinary cutting edge innovations of the cognitive sciences. It is the unique meeting of the founder of Affective Neuroscience with an interdisciplinary set of scholars who follow the implications of this work through the philosophy of psychology, the philosophy of Self, and neuroscience and law.

Rami Gabriel, Jaak Panksepp, Stephen Asma and Glennon Curran

Symposia, Cont'd

The Mechanics of Embodiment

Friday, August 13, 12:30 – 2:00 p.m.

There currently exist a large number of interesting and intriguing empirical effects regarding embodied cognition. A critical next step in the development of embodied theories is to flesh out ideas in terms of implemented computational models. This symposium features speakers who currently are working toward that goal. These researchers describe and discuss challenges for embodied models. The major focus is on presenting current efforts to model human cognition in a physical agent with sensory and motor capabilities, implementing the perceptual symbols systems framework, and modeling the dynamic on-line influences of integrated sensori-motor processes.

Giovanni Pezzulo, Angelo Cangelosi, Michael Spivey, Lawrence Barsalou, Martin Fischer and Ken McRae

Developmental and Computational Perspectives on Infant Social Cognition

Friday, August 13, 2:00 – 3:30 p.m.

Adults effortlessly and automatically infer complex patterns of goals, beliefs and other mental states as the causes of others' actions. Yet before the last decade little was known about the developmental origins of these abilities in early infancy. Our understanding of infant social cognition has now improved dramatically. Even preverbal infants appear to perceive goals, preferences, and even beliefs from sparse observations of intentional agents' behavior. Furthermore, they use these inferences to predict others' behavior in novel contexts and to make social evaluations.

Noah Goodman, Chris Baker, Joshua Tenenbaum, Chris Lucas, Kiley Hamlin, Tamar Kushnir, Tomer Ullman and Elizabeth Spelke

Emerging Insights from Eye-Movement Research on Category Learning

Friday, August 13, 3:30 – 5:00 p.m.

This symposium brings together four talks on eye-tracking and categorization. Each talk focuses on a different aspect of categorization and demonstrates how eye-tracking can extend our knowledge. One recent trend in category learning is the use of alternative training procedures. The inference learning task is the most popular of these procedures and in the first talk Aaron Hoffman presents eye-tracking data illuminating the differences between inference learning and categorization. Bob Rehder then presents his recent work on understanding the learning difficulties associated with Parkinson's disease. Marcus Watson discusses work using eye-tracking to inform our understanding of the basic issue in category learning: error. Finally, Mark Blair discusses the relationship between working memory, attention and performance in a category learning task.

Bob Rehder, Mark Blair, Aaron Hoffman and Marcus Watson

Symposia, Cont'd

Dynamic Decision Making

Saturday, August 14, 10:00 – 11:30 a.m.

The experimental study of decision-making has historically focused on simple single-trial judgment or reasoning tasks. However, real world behavior often necessitates on-line decision making, planning and sequentially organized behavior. The goal of the proposed symposium is to bring together researchers who are working to understand the cognitive processes underlying dynamic decision-making, defined as tasks or contexts that are structured as a sequence of interdependent decision. A symposium on this topic is particularly timely since research in this area is having a tremendous impact on the field of psychology. The key topics covered are: how people plan sequences of actions to accomplish goals; the neurobiology of sequential decision-making and planning; how cognitive representations of the task environment support planning and decision-making; and how people balance exploration and exploitation to arrive at effective decision strategies in unknown environments.

Todd Gureckis Jared Hotaling, Michael Lee, Bradley Love and Dylan Simon

Bridging the Gap: From Cognitive Anthropology to Cognitive Science

Saturday, August 14, 11:30 a.m. – 1:00 p.m.

Although cognitive anthropology once was a pioneer in the cognitive revolution and founding member of the cognitive sciences, over the years its participation and influence have diminished – to the detriment of both cognitive anthropology and cognitive science. Meanwhile, though, interactions between culture and cognition are increasingly recognized as being of prime interest for cognitive science. Among the most important issues that call for anthropological expertise is the question of cognitive and/or linguistic universals. Anthropology, with its expertise in culture and language, thus becomes an invaluable partner for cognitive science research. But only recently have initiatives been launched to re-calibrate the relationships among the subfields of cognitive science. This seminar will review such initiatives.

Andrea Bender, Sieghard Beller, Giovanni Bennardo, James S Boster, Asifa Majid and Douglas Medin

Flux: Fundamental or Frivolous?

Saturday, August 14, 1:00 – 2:30 p.m.

A broad range of findings across the cognitive sciences has emerged, revealing surprising flexibility and dynamic flux in a large range of cognitive domains. These include exciting new discoveries of neuroplasticity well into adulthood, of great cognitive variability as a function of the statistical properties of one's environment (from the patterns in natural language to those in embodied experience), and discoveries of the surprisingly dynamic microstructure of cognition. Do such findings demonstrate that many fundamental aspects of cognition are indeed quite flexible? Or does a finding that some aspect of cognition is flexible mean that it is therefore not fundamental? Or is flux the only truly fundamental thing about cognition in the first place? The talks in this symposium will speak to these questions from a variety of perspectives (incorporating ideas from development, neuroscience, computational studies, and cross-cultural approaches) and they aim to help us clarify our thinking about what such findings mean.

Lera Boroditsky, Helen Neville, Christina Karns, Arthur Markman and Michael Spivey