



Cognitive Systems: Human Cognitive Models in System Design

Hosted by Sandia National Laboratories and the University of New Mexico

Santa Fe, New Mexico / June 30th - July 2nd

Workshop Agenda

Monday June 30th

8:00-8:10

Open the Workshop

Chris Forsythe & Tim Goldsmith

8:10-9:30

Welcome Address

Al Romig, Sandia National Laboratories

8:30-9:30

Keynote Address

Cogito Ergo Sum: Building The Symbiotic Cognitive World Of Carbon And Silicon

LCDR Dylan Schmorrow, DARPA

9:30-10:00

Breakout Session Introductions

- Analogues for Cognitive System Interaction – Gabe Radvansky, Notre Dame University
- Integration with Physiological Input Sources – Don Tucker, Electrical Geodesic
- Automated Knowledge Capture – Ann Speed, Sandia National Laboratories
- Psychological Grounding for Computational Systems – Roger Schvaneveldt, Arizona State Univ.
- Meta-Cognition or What a Cognitive System May/Should Know About Itself – Michael Bernard & Nina Berry, Sandia National Laboratories
- Products & Applications – John Wagner, Sandia National Laboratories

10:00-10:15

Break

10:15-10:45

Situation Models in Comprehension, Memory and Augmented Cognition

Gabe Radvansky, Notre Dame University

10:45-11:15

Cognitive Information Processing: Taking a Cue From the Brain

Lokendra Shastri, UC Berkeley

11:15-11:45

Designing Attentive Notification Systems: Five HCI Challenges

Scott McCrickard, Virginia Tech

11:45-12:15

Engaging Innate Human Cognitive Capabilities to Coordinate Human Interruption: The HAIL System

Dan McFarlane, Lockheed Martin

12:15-13:30

Lunch

13:30-14:00

The Technological Relevance of Natural Language Pragmatics and Speech Act Theory

Michael Covington, University of Georgia

14:00-14:30

Robots and Language

Deb Roy, Massachusetts Institute of Technology

14:30-15:00

Emulating Human Essay Scoring With Machine Learning Methods

Darrell Laham, Knowledge Analysis Technologies

15:00-15:15

Break

15:15-15:45

The Arousal Meter

Adam Hoover, Clemson University

15:45-16:15

Cognitive Models to Cognitive Systems

Chris Forsythe, Sandia National Laboratories

16:15-19:00

Breakout Dinner Session

(participants should plan to have dinner together and participants in the demo session should allow time to set up their demonstrations)

19:00-21:00

Demonstration Session

- **Story And Discourse: Using Planning And Natural Language Models to Create Engaging and Interactive Stories In Computer Games**, Michael Young, North Carolina State University
- **Cognitive Collective For Insider Threat Detection**, Michael Bernard, Sandia National Labs
- **AWACS Real-Time Cognitive Model With Discrepancy Detection**, Patrick Xavier, Sandia National Laboratories
- **Vxinsight Analysis for Cognitive Systems Domain**, Kevin Boyack, Sandia National Labs
- **Rapid Cognitive Simulations: Enabling Technologies**, Douglas Whatley, Breakaway Games
- **Decision-Aiding Algorithm for Interpreting Physiological Data in Hazardous Situations**, Adele Doser, Sandia National Laboratories
- **Emulating Human Essay Scoring With Machine Learning Methods**, Darrell Laham, Knowledge Analysis Technologies
- **Exploring the Application of Cognitive Principles and Virtual Reality to Reduce the Incidence of Aircraft Maintenance Errors**, Alex Chaparro, National Institute for Aviation Research

Tuesday July 1st

8:00-8:15

Opening Remarks

Chris Forsythe & Tim Goldsmith

8:15-9:15

Invited Address

Autotutor: An Intelligent Tutoring System With Mixed Initiative Dialog

Art Graesser, University of Memphis

9:15-9:45

Story and Discourse: Using Planning and Natural Language Models to Create Engaging and Interactive Stories in Computer Games

Michael Young, North Carolina State University

9:45-10:15

Reasoning and Planning with Preferences Using Prioritized Default Theory

Enrico Pontelli, New Mexico State University

10:15-10:30

Break

10:30-11:00

Real-Time Monitoring of Cognitive State Using Dense-Array EEG

Don Tucker, Electrical Geodesic

11:00-11:30

Imaging the Brain with Light: New Techniques for Monitoring Cognition

Amy Kruse, DARPA

11:30-13:30

Breakout Lunch Session

(participants should plan to have lunch together)

13:30-14:00

Untangling Computational Intuitions about Naturalistic Decision Making

Walt Warwick, Micro Analysis and Design

14:00-14:30

Modeling Aesthetic Veracity in Humanoid Robots as a Tool for Understanding Social Cognition.

David Hanson, University of Texas at Dallas

14:30-15:00

Machine Learning Methods for Parameter Acquisition in a Human Cognitive Model

Terran Lane, University of New Mexico

15:00-15:30

Distributed, Competition-Based Feature Extraction: Application to Personal Information Retrieval

Travis Bauer, Sandia National Laboratories

15:30-15:45

Break

15:45-16:15

Planning with Sensing Actions and Incomplete Information Using Logic Programming

Son Cao Tran, New Mexico State University

16:15-16:45

Exploring the Application of Cognitive Principles and Virtual Reality to Reduce the Incidence of Aircraft Maintenance Errors, Alex Chaparro, National Institute for Aviation Research

16:45-TBD

Breakout Dinner Session

(participants should plan to have dinner together)

Wednesday July 2nd

8:00-8:15

Opening Remarks

8:15-9:15

Invited Address

Finding Meaning in Psychology

Roger Schvaneveldt, Arizona State University

9:15-9:45

Retinal Oscillations that Encode Large Contiguous Features: Implications for how the Nervous System Processes Visual Information

Garrett Kenyon, Los Alamos National Laboratory

9:45-10:15

Contextual Workload Assessment and Multi-Modal Communication: DaimlerChrysler in Augmented Cognition

Wilhelm Kincses, DaimlerChrysler

10:15-10:30

Break

10:30-11:00

Taking AI From the Laboratory to Wal Mart: What Game Players Think They See

Douglas Whatley, Breakaway Games

11:00-12:30

Report from Breakout Sessions