ICCM 2013

The 12th International Conference on Cognitive Modelling

Carleton UNIVERSITY
Canada's Capital University

July 11 – 14, 2013
Carleton University, Ottawa, Canada

Co-located with:

BRiMS

BRiMS 2013

The 22nd Annual Conference on Behavior Representation in Modeling and Simulation

Note: Separate sessions are held for BRiMS and ICCM on Friday, July 12.

Sponsored by:

Carleton University
Institute of Cognitive Science
Faculty of Arts and Social Science
Department of Psychology

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Turning data into insight

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Thursday, July 11, 2013
Tutorials

9:00 – 5:00	206 TB	**The Soar cognitive architecture:** *John Laird*
9:00 – 12:15	204 TB	**Modeling human performance in C3TRACE:** *Walter Warwick*
9:00 – 12:15	213 TB	**How to analyze verbal protocols to support cognitive modeling:** *Thora Tenbrink*
12:15 – 1:45		Lunch break
1:45 – 5:00	213 TB	**Quantum models of cognition and decision:** *Jerome Busemeyer, Zheng Wang*
1:45 – 5:00	204 TB	**Measuring simulation-observation fit: An introduction to ordinal pattern analysis:** *Warren Thorngate*

Tutorial attendees are welcome to join us at Mike's Place (the on-campus pub) for a (non-sponsored) dinner and social gathering afterwards.

Also scheduled at this time:

9:00 – 5:00	208 TB	**Twentieth Annual ACT-R Workshop**

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Friday, July 12, 2013

8:00 – 9:00	River Atrium	Registration
9:00 – 10:30	River 2200	**Keynote:** *Chris Eliasmith*
10:30 – 11:00	River Atrium	Coffee break
11:00 – 12:30 ICCM	River 2200	**A data-driven mapping of five ACT-R modules on the brain:** *Jelmer Borst, Menno Nijboer, Niels Taatgen, & John Anderson* **Towards a dynamical view of ACT-R's electrophysiological correlates:** *Marieke van Vugt* **Modeling speech errors by analogy:** *Deryle Lonsdale & Hitokazu Matsushita* **Using cognitive models to investigate the temporal dynamics of semantic memory impairments in the development of Alzheimer's disease:** *Brendan Johns, Vanessa Taler, David Pisoni, Martin Farlow, Ann Hake, David Kareken, Frederick Unverzagt, & Michael Jones*
11:00 – 12:30 BRiMS	River 1200	**Modelling the Security Analyst's Role: Effects of Similarity and Past Experience on Cyber Attack Detection:** *Amanjot Kaur, Varun Dutt, & Coty Gonzalez* **Accounting for the integration of descriptive and experiential information in a repeated prisoner's dilemma using an instance-based learning model:** *Noam Ben-Asher, Varun Dutt, & Coty Gonzalez* **Decision Criteria for Model Comparison Using Cross-Fitting:** *Holger Schultheis & Ankit Singhaniya* **A Model-based Evaluation of Trust and Situation Awareness in the Diner's Dilemma Game:** *John O'Donovan, Rashaad Jones, Laura Marusich, Yun Teng, Coty Gonzalez, & Tobias Hollerer*

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12:30 – 1:30		Lunch and ICCM Executive Meeting
1:30 – 3:00 ICCM	River 2200	**Diminishing return in transfer: A PRIM model of the Frensch (1991) arithmetic experiment:** *Niels Taatgen* **Learning via gradient descent in Sigma:** *Paul Rosenbloom, Abram Demski, Teawon Han, & Volkan Ustun* **Emergence of border and surface completion (both spatial and temporal) in a flowcentric model of narrow slit viewing:** *David Pierre Leibovitz* **Decision making in a dynamically structured holographic memory model: Learning from delayed feedback:** *Matthew Kelly & Robert West*
1:30 – 3:00 BRiMS	River 1200	**A concise model for innovation diffusion combining curvature-based opinion dynamics and zealotry** *Dustin Arendt* **A Trust-Based Framework for Information Sharing Behavior in Command and Control Environments:** *Kevin Chan, Jin-Hee Cho, & Sibel Adali* **Advantages of ACT-R over Prolog for Natural Language Analysis:** *Jerry Ball* **The Relational Blackboard:** *Robert Abott*
3:00 – 3:30	River Atrium	Coffee break

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3:30 – 5:00 ICCM	River 2200	**A biologically plausible spiking neuron model of fear conditioning:** *Carter Kolbeck, Trevor Bekolay, & Chris Eliasmith* **Intrinsic motivation signals for driving the acquisition of multiple tasks: A simulated robotic study:** *Vieri Giuliano Santucci, Gianluca Baldassarre, & Marco Mirolli* **Dynamic memory via delay coincidence detection for robot maze navigation:** *Francis Jeanson & Anthony White* **A balanced Hebbian algorithm for associative learning in ACT-R:** *Robert Thomson & Christian Lebiere*
3:30 – 5:00 BRiMS	River 1200	**Differences in Performance with Changing Mental Workload as the Basis for an IMPRINT Plug-in Proposal:** *Daniel Cassenti, Troy Kelley, & Richard Carlson* **An ACT-R Model of Sensemaking in a Geospatial Intelligence Task:** *Jaehyon Paik, Peter Pirolli, & Wei Dong* **Using the Immersive Cognitive Readiness Simulator to Validate the ThreatFire™ Belt as an Operational Stressor: A Pilot Study:** *Debbie Patton, Patrick Loukota, & Eric Avery* **Integrated Simulation of Attention Distribution and Driving Behavior:** *Bertram Wortelen, Andreas Ladtke, & Martin Baumann*
5:00 – 5:30	River Atrium	Coffee break
5:30 – 7:00	River Atrium	**Poster Session 1**

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Saturday, July 13, 2013

8:00 – 9:00	River Atrium	Registration
9:00 – 10:30	River 2200	**Keynote:** *Jerome Busemeyer*
10:30 – 11:00	River Atrium	Coffee break
11:00 – 12:30	River 2200	**A model of constrained knowledge access in crossword puzzle players:** *Shane Mueller & Kejkaew Thanasuan* **Modeling the concentration game with ACT-R:** *Titus Barik, Arpan Chakraborty, Brent Harrison, David Roberts, & Robert St. Amant* **Modeling trust in multi-agent systems:** *Eli Stickgold*
12:30 – 1:30		Lunch
1:30 – 3:00	River 2200	**Symposium: The Challenge of Robotics for Cognitive Architectures:** *Antonio Chella, Unmesh Kurup, John Laird, Greg Trafton, Jerry Vinokurov, B. Chandrasekaran*
3:00 – 3:30	River Atrium	Coffee break
3:30 – 5:00	River 2200	**Simulating aggregate player behavior with learning behavior trees:** *Emmett Tomai* **Declarative to procedural tutors: A family of cognitive architecture-based tutors:** *Frank Ritter* **A computational model for situated task learning with interactive instruction:** *Shiwali Mohan, James Kirk, & John Laird* **Deduction as stochastic simulation:** *Sangeet Khemlani, Greg Trafton, & Phil Johnson-Laird*
5:00 – 5:30	River Atrium	Coffee break
5:30 – 7:00	River Atrium	**Poster Session 2**

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Sunday, July 14, 2013

8:00 – 9:00	River Atrium	Registration
9:00 – 10:30	River 2200	**Keynote:** *Michael Jones*
10:30 – 11:00	River Atrium	Coffee break
11:00 – 12:30	River 2200	**The role of artificial intelligence research methods in cognitive science:** *Jim Davies* **Architectural considerations for modeling cognitive-emotional decision making:** *Wouter Lotens* **Trust definitions and metrics for social media analysis:** *Eli Stickgold* **How many times should a stochastic model be run? An approach based on confidence intervals:** *Mike Byrne*
12:30 – 1:30		Lunch
1:30 – 3:00	River 2200	**Symposium: Vector Symbolic Architectures:** *Chris Eliasmith, Mike Jones, Douglas Mewhort*
3:00 – 3:30	River 2200	Closing Ceremonies

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Poster Session 1: Friday, July 12, 5:30 – 7:00

1. **Modeling Developmental Transitions in Reasoning about False Beliefs of Others**
   Burcu Arslan, Niels Taatgen, Rineke Verbrugge
2. **Modeling the Binding of Implicit Arguments in Complement Clauses in ACT-R/Double-R**
   Jerry Ball
3. **Modelling Spatial Relations' Influence on Planning**
   Stefano Bennati, Marco Ragni
4. **Evaluation of implicit score and K2 algorithm using Structural hamming distance**
   Lobna Bouchaala, Ahmed Rebai
5. **SOILIE: A Computational Model of 2D Visual Imagination**
   Vincent Breault, Sébastien Ouellet, Sterling Somers, Jim Davies
6. **A Study of the Effect of Individual Experience and Variance on Optimal Information Sampling**
   Xiuli Chen, Andrew Howes
7. **Take it or leave it: Cognitive rules and satisfying choices**
   Wahida Chowdhury, Warren Thorngate
8. **Affine Transforms on Probabilistic Representations of Categories**
   Denis Cousineau
9. **A neural model of the development of expertise**
   Travis DeWolf, Chris Eliasmith
10. **Cognition as a Game of Complexity**
    Rafik Hadfi, Takayuki Ito
11. **Neurobiological Extensions to a Mathematical Model for Performance Enhancement Observed under Conditions of Noninvasive Brain Stimulation**
    Tiffany Jastrzembski, Ion Juvina, Andy McKinley
12. **Memory Control in a FitzHugh-Nagumo Network via STDP**
    Francis Jeanson, Sylvain Chartier
13. **DyBaNeM: Bayesian Framework for Episodic Memory Modelling**
    Rudolf Kadlec, Cyril Brom
14. **A Hybrid Model for Execution Monitoring in Autonomous Agents**
    Unmesh Kurup, Christian Lebiere, Anthony Stentz, Martial Hebert
15. **The Computational Problem of Prospective Memory Retrieval**
    Justin Li, John Laird
16. **Modeling of expectations and surprise in ACT-R**
    Stefan Lindner, Nele Russwinkel
17. **Perceptra: A New Approach to Pattern Classification Using a Growing Network of Binary Neurons (Binons)**
    Brett N. Martensen

18. **Reasoning about mental states in sequential games: As simple as possible, as complex as necessary**
    Ben Meijering, Niels A Taatgen, Hedderik Van Rijn, Rineke Verbrugge
19. **Control processes in free recall**
    Donald Franklin, Douglas Mewhort
20. **Cognitive Control in Number Processing: A Computational Model**
    Stefan Huber, Korbinian Moeller, Hans-Christoph Nuerk, Pedro Macizo, Amparo Herrera, Klaus Willmes
21. **The Impact of Sleep Loss on Time Estimation: Reconciling Conflicting Results through Modeling**
    Larry Moore, Glenn Gunzelmann
22. **Predicting Interference in Concurrent Multitasking**
    Menno Nijboer, Jelmer Borst, Hedderik Van Rijn, Niels Taatgen
23. **From Casual Deduction to Spatial Relations: Bottom-up and Top-down Reasoning Unified**
    Enkhbold Nyamsuren, Niels Taatgen
24. **Using Relations To Describe Three-Dimensional Scenes: A Model of Spatial Relation Apprehension and Interference**
    Sebastien Ouellet, Jim Davies
25. **A Neurocomputational Approach to Modeling Human Behavior in Simulated Unmanned Aerial Search Tasks**
    Brandon Perelman, Shane Mueller
26. **A Framework for Simulating Visual Search Strategies**
    Michael Raschke, Stephan Engelhardt, Thomas Ertl
27. **Cognitive Simulation of Limited Working Memory Capacity Applied to an Air Traffic Control Task**
    Hardy Smieszek, Peer Manske, Andreas Hasselberg, Nele Russwinkel, Christoph Moehlenbrink
28. **Steering Control in a Flight Simulator Using ACT-R**
    Sterling Somers, Robert West
29. **Automata and Complexity in Multiple-Quantifier Sentence Verification**
    Jakub Szymanik, Shane Steinert-Threlkeld, Marcin Zajenkowski, Thomas F. Icard III
30. **A Long-Term Memory Competitive Process Model of a Common Procedural Error, Part II: Working Memory Load and Capacity**
    Franklin Tamborello, Gregory Trafton
31. **A computational model of bilingual inhibitory control in a lexical decision task**
    Andrew Valenti, Matthias Scheutz
32. **Exploring cognitivist and emotivist positions of musical emotion using neural network models**
    Naresh Vempala, Frank Russo
33. **Visual Imagination in Context: Retrieving a Coherent Set of Labels with Coherencer**
    Michael Vertolli, Jim Davies
34. **Simulating Attention Distribution of a Driver Model: How to Relate Expectancy and Task Value?**
    Bertram Wortelen, Andreas Lüdtke, Martin Baumann

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Poster Session 2: Saturday, July 13, 5:30 – 7:00

1. **Theoretical Basis of a Context-Based Language Model for Semantic Classification**
   Ehsan Amjadian
2. **Forcing Strategy Uniformity with Utility Manipulation: A Computational Model**
   Kevin Barry, Wayne Gray
3. **Evolution of Response Time Distribution in Menu Search**
   Jacob Costello, Peter Hastings
4. **Towards Adding Bottom-Up Homeostatic Affect to ACT-R**
   Christopher L. Dancy, Ryan Kaulakis
5. **Differentiating Models of Associative Learning: Reorientation, Superconditioning, and the Role of Inhibition**
   Brian Dupuis, Michael Dawson
6. **Cyber Situation Awareness: Modelling the Effects of Similarity and Scenarios on Cyber Attack Detection**
   Amanjot Kaur, Varun Dutt
7. **Cyber Situation Awareness: Rational Methods versus Instance-Based Learning Theory for Cyber Threat Detection**
   Basava Kanaparthi, Ramakrishna Reddy, Varun Dutt
8. **Cyber Security: Evaluating the Effects of Attack Strategy and Base Rate through Instance-Based Learning**
   Aman Arora, Varun Dutt
9. **The Devil is in the Distribution: Refining an ACT-R model of a Continuous Motor Task**
   Melissa Gallagher, Michael Byrne
10. **Initial ACT-R Extensions for User Modeling in the Mobile Touchscreen Domain**
    Kristen Greene, Franklin Tamborello
11. **Connecting ACT-R to the World with JSON over TCP**
    Ryan Hope, Wayne Gray, Mike Schoelles
12. **"Triune" autonomous agent with affect**
    Paul Joseph, Haim Levkowitz
13. **When to apply brain stimulation to achieve learning acceleration**
    Ion Juvina, Tiffany Jastrzembski, Andy McKinley
14. **Towards Modeling Trust Behavior**
    William G. Kennedy, Frank Krueger
15. ***Architecture for goal-driven behavior of virtual opponents in fighter pilot combat training***
    Arash Khatami, Pieter Huibers, Jan Joris Roessingh

16. **SAME: An ACT-R Spreading Activation Modeling Environment**
    Kam Kwok, Robert West
17. **Dendritic+ Processing in an Emergic Network Model of Narrow Slit Viewing**
    David Pierre Leibovitz, Robert West
18. **A Preliminary Study in Modeling Bilateral Components of Attention**
    Hannah Limerick, Sharon Wood
19. **Issues in Implementing Three-Level Semantics with ACT-R**
    Sebastian Lohmeier, Nele Russwinkel
20. **Semantic memory for syntactic disambiguation**
    Deryle Lonsdale, Jeremiah McGhee, Nathan Glenn, Seth Wood, Tory Anderson
21. **Spatial Working Memory in the LIDA Cognitive Architecture**
    Tamas Madl, Stan Franklin, Ke Chen, Robert Trappl
22. **Modeling Strategic Dynamics Under Alternative Information Conditions**
    Alessandro Oltramari, Christian Lebiere, Noam Ben-Asher, Ion Juvina, Cleotilde Gonzalez
23. **For Recognition Memory Number of Cue Elements and their Fans Interact: Incomplete Cues can be as Effective as Complete Cues**
    Aryn Pyke, Matthew Rutledge-Taylor, Robert West
24. **Risk-Seeking in a Continuous Game of Timing**
    David Reitter, Jens Grossklags, Alan Nochenson
25. **Cognitive models: Understanding their critical role as explanatory and predictive hypothesis generators in cognition research**
    Jen Schellinck, Richard Webster
26. **Speculations on Model Tracing for Visual Analytics**
    Michael Schoelles, Wayne Gray
27. **High level Representations of 3D Models of Buildings**
    Sebastien Ouellet, Sterling Somers, Jim Davies
28. **Predicting Tags for StackOverflow Posts**
    Clayton Stanley, Michael Byrne
29. **Bidirectional Associative Memory and Learning of Nonlinearly Separable Tasks**
    Christophe Tremblay, Kaia Myers-Stewart, Laurence Morissette, Sylvain Chartier
30. **Robustness: Quantification and Application**
    Matthew Walsh, Kevin Gluck
31. **The Macro Architecture Hypothesis: Applications to Modeling Teamwork, Conflict Resolution, and Literary Analysis**
    Robert West, Emmanuelle Hancock, Sterling Somers, Korey MacDougall, Francis Jeanson
32. **Using Model Tracing and Evolutionary Algorithms to Determine Parameter Settings for Cognitive Models From Time Series Data such as Visual Scanpaths**
    Yunfeng Zhang, Anthony Hornof