AIC&SweCog 2022

8th International Workshop on
Artificial Intelligence and Cognition (AIC)

17th Conference of the
Swedish Cognitive Science Society (SweCog)

15-17 June 2022
Örebro University
Sweden

Wednesday, 15/6

Time	AIC	SweCog
12 - 13	AIC Registration	
13:05 - 13:15	AIC Opening	
13:15 - 14:15	AIC Speaker: Michael Beetz	
14:15 - 15	AIC Presentations D1-1	
15 - 15:30	coffee break	
15:30 - 17	AIC Presentations D1-2	
19 - 21	AIC Dinner	

Keynote Speaker: Michael Beetz

Future action models for AI-powered and cognitively-enabled robots

The realization of computational models for accomplishing everyday manipulation tasks for any object and any purpose would be a disruptive breakthrough in the creation of versatile, general-purpose robot agents; and it is a grand challenge for AI and robotics. Humans are able to accomplish tasks such as "cut up the fruit" for many types of fruit by generating a large variety of context-specific manipulation behaviours. They can typically accomplish the tasks on the first attempt, despite uncertain physical conditions and novel objects. Acting so effectively requires comprehensive reasoning about the possible consequences of intended behaviour, before physically interacting with the real world.

In the talk, I will sketch ideas about a knowledge representation and reasoning (KR&R) framework based on explicitly-represented and machine-interpretable inner-world models, that enable robots to contextualize underdetermined manipulation task requests on the first attempt. The hybrid symbolic/sub-symbolic KR&R framework is to contextualize actions by reasoning symbolically in an abstract and generalized manner, but also by reasoning with "one's eyes and hands" through mental simulation and imagistic reasoning.

D1-1: AIC Oral Presentations (Wed. 15/6)

D1-1-1 (AIC-short) **Wellington Pacheco Ferreira** and Walter Teixeira Junior.
Toward An Artificial Cognitive System To Assist Caregivers In Decision-Making For Persons Living With Dementia

D1-1-2 (AIC-short) Maurice Lamb, Estela Pérez Luque and **Erik Billing**.
Understanding eye-tracking in virtual reality

D1-1-3 (AIC-short) **Valentina Fantasia**, Ingar Brinck and Christian Balkenius.
Making sense with social robots: Extending the landscape of investigation in HRI

D1-1-4 (AIC-short) **Mohamadreza Faridghasemnia**.
Appreciation of Symbolic Attributes in Machine Perception

D1-2: AIC Oral Presentations (Wed. 15/6)

D1-2-1 (AIC-full) **Alexander Kalinowski** and Yuan An.
Quantifying the Impact of Predicate Similarities on Knowledge Graph Triple Embeddings

D1-2-2 (AIC-full) **Hiroyuki Kido**.
Generative Logic Models for Data-Based Symbolic Reasoning

D1-2-3 (AIC-short) **Andreas Persson** and Amy Loutfi.
Embodied Affordance Grounding using Semantic Simulations and Neural-Symbolic Reasoning: An Overview of the PlayGround Project

D1-2-4 (AIC-short) **Jakob Stenseke** and Christian Balkenius.
Assessing the Time Efficiency of Ethical Algorithms

Thursday, 16/6

Time	AIC	SweCog
8:30 - 8:55		SweCog Registration
8:55 - 9		SweCog Opening
9 - 10	Joint Speaker: Ute Schmid	
10 - 10:30	coffee break	
10:30 - 12	Joint Presentations D2-1	
12 - 13:15	lunch time	
13:15 - 14:10	Joint Presentations D2-2	
14:10 - 14:30	Elevator Pitches of Posters D2-3	
14:30 - 15	coffee break + Poster Session	
15 - 16	Joint Poster Session (AIC&SweCog)	

16 - 17	Joint Speaker: Kees van Deemter

17:15 - 19:30	AIC&SweCog Reception with Light Food

Keynote Speaker: Ute Schmid

Hybrid, Explanatory, Interactive Machine Learning - Towards Trustworthy Human-AI Partnerships

For many practical applications of machine learning, it is appropriate or even necessary to make use of human expertise to compensate for a too-small amount or low quality of data. Taking into account knowledge which is available in explicit form reduces the amount of data needed for learning. Furthermore, even if domain experts cannot formulate knowledge explicitly, they typically can recognize and correct erroneous decisions or actions. This type of implicit knowledge can be injected into the learning process to guide model adaptation. These insights have led to the so-called third wave of AI with a focus on explainability (XAI).

In the talk, I will introduce research on explanatory and interactive machine learning. I will present inductive programming as a powerful approach to learning interpretable models in relational domains. Arguing the need for specific explanations for different stakeholders and goals, I will introduce different types of explanations based on theories and findings from cognitive science. Furthermore, I will show how intelligent tutor systems and XAI can be combined to support constructive learning. Algorithmic realisations of explanation generation will be complemented with results from psychological experiments investigating the effect on joint human-AI task performance and trust. Finally, current research projects are introduced to illustrate applications of the presented work in medical diagnostics, quality control in industrial production, file management, and accountability.

D2-1: AIC&SweCog Joint Oral Presentations (Thu. 16/6)

D2-1-1 (AIC-full) **Joel Michelson**, Deepayan Sanyal, James Ainooson, Yuan Yang and Maithilee Kunda.
Experimental design and facets of evidence for computational theory of mind

D2-1-2 (AIC-short) **Ursula Addison**.
The Source of Desire: Personal Identity as a Drive for Agent Behavior

D2-1-3 (AIC-short) **Antero Karvonen** and Pertti Saariluoma.
Cognitive Mimetics - SMT Model

D2-1-4 (AIC-short) **Jasmin Grosinger**.
On Proactive Human-AI systems

D2-1-5 (AIC-short) **Sara Mahmoud** and Alice Plebe.
Road map for cognitively-inspired artificial systems

D2-1-6 (SweCog) **Andreas Kalckert**.
From rubber hands to virtual hands - A critical examination of the processes underlying bodily illusions

D2-2: AIC&SweCog Joint Oral Presentations (Thu. 16/6)

D2-2-1 (AIC-full) **Yuan Yang**, Deepayan Sanyal, Joel Michelson, James Ainooson and Maithilee Kunda.
A Conceptual Chronicle of Solving Raven's Progressive Matrices Computationally

D2-2-2 (SweCog) **Joel Parthemore**.
Artefactual ethics as opportunity for rethinking "natural" ethics

D2-3: Elevator Pitches of Posters (Thu. 16/6)

D2-3-1 (SweCog) **Andreas Falck** and Janne von Koss Torkildsen.
The leader learns it all? Using the "Kaptein Morf" tablet game to examine how different roles in joint problem solving affect learning

D2-3-2 (SweCog) **Anders Persson**.
What is Reason in the Age of Artificial Intelligence and predictive processing?

D2-3-3 (SweCog) **Emma Mainza Chilufya**.
The Design of Intelligent Virtual Agents Using User-Centered Design Methods

D2-3-4 (SweCog) **Anna Persson**.
The role of prior experience in understanding speech: computational and experimental approaches to vowel perception

D2-3-5 (SweCog) **Philip Gustafsson**.
Vocal Characteristics predict Accuracy in Eyewitness Testimony

D2-3-6 (SweCog) **Alexander Tagesson**.
Do objective judges become emotional?

D2-3-7 (SweCog) **Maybí Morell Ruiz**.
What do our eyes say about our estimation strategies?

D2-3-8 (SweCog) **Oscar Bjurling**.
Human Interaction with Autonomous Drone Swarms: Design and control challenges

Keynote Speaker: Kees van Deemter

Explanation and Rationality in Models of Language

When theories of human behaviour aim to offer explanations, they often use rationality as their linchpin: to the extent that a theory helps us to see behaviour as optimising some form of rationality/utility, we feel that our theory explains this behaviour. This approach is not uncontroversial, however. For example, four decades of research in Behavioural Economics have shown that people behave in ways that are not easily explained by rationality alone.

Rationality has long had its adherents in the explanation of language use as well, for example via the Gricean Maxims. Recently, a Bayesian approach known as Rational Speech Act (RSA) theory has made inroads into the computational modelling of language use. In a nutshell, the idea is to build tightly coupled models of language comprehension and production in which speakers and hearers assume each other to behave rationally.

In this talk, I will sketch a series of experiments focussing on the way in which speakers refer to objects. These experiments paint a less "rational" picture of human language use, and they offer confirmation of a model, known as Probabilistic Referential Overspecification (PRO), that balances rationality with other considerations. I hope to engage in a discussion of the dilemma of having to choose between two of these very different models, one of which is elegant and explanatory yet empirically inadequate, while the other is messy yet empirically very adequate.

Conceptualization in Reference Production: Probabilistic Modeling and Experimental Testing. R.P.G. van Gompel, K. van Deemter, A. Gatt, R. Snoeren, E.J. Krahmer (2019). Psychological Review 126 (3), 345-373.

Friday, 17/6

Time	AIC	SweCog
9 - 10:15	AIC Presentations D3-A1	SweCog Presentations D3-S1
10:15 - 10:45	coffee break	
10:45 - 11:50	Joint Presentations D3-2	
11:50 - 12	AIC Closing	
12 - 13:15	lunch time	
13:15 - 14:45		SweCog Presentations D3-3
14:45 - 15		SweCog Closing

D3-A1: AIC Oral Presentations (Fri. 17/6)

D3-A1-1 (AIC-full) **Agnese Chiatti**, Gianluca Bardaro, Enrico Motta and Enrico Daga.
Commonsense Spatial Reasoning for Visually Intelligent Agents

D3-A1-2 (AIC-full) **Vedran Galetic** and Alistair Nottle.
Inherently Interpretable Knowledge Representation for a Trustworthy Artificially Intelligent Agent Teaming with Humans in Industrial Environments

D3-A1-3 (AIC-short) **Erik Jergéus**, Leo Karlsson Oinonen, Emil Carlsson and Moa Johansson.
Towards Learning Abstractions via Reinforcement Learning

D3-A1-4 (AIC-short) **Richard Scherl**.
A situation-calculus based model of linguistic context

D3-S1: SweCog Oral Presentations (Fri. 17/6)

D3-S1-1 (SweCog) **Pierre Gander**.
What kind of memory is memory of fiction?

D3-S1-2 (SweCog) **Leonard Ngaosuvan**.
Cognitive bias in social services CPS case argumentation

D3-S1-3 (SweCog) **Linus Holmberg**.
Sexual Economics in Swedish Dating: Pity Poor Men

D3-2: AIC&SweCog Joint Oral Presentations (Fri. 17/6)

D3-2-1 (AIC-full) **Yann Munro**, Isabelle Bloch, Mohamed Chetouani, Marie-Jeanne Lesot and Catherine Pelachaud.
Argumentation and Causal Models in Human-Machine Interaction: A Round Trip

D3-2-2 (AIC-full) **Stevan Tomic**.
Towards Robotic Minds: Dynamic Interpretation and Schemata Recombination

D3-2-3 (AIC-short) **Tosin Adewumi**, Foteini Simistira Liwicki and Marcus Liwicki.
Exploring Swedish & English fastText Embeddings

D3-3: SweCog Oral Presentations (Fri. 17/6)

D3-3-1 (SweCog) **Magnus Johnsson**.
Human-Centered AI for Personalization in Experiential Learning Environments

D3-3-2 (SweCog) **Andreas Falck**.
Online filters and social trust: why we should still be concerned about Filter Bubbles

D3-3-3 (SweCog) **Amandus Krantz**.
The Crisis of Trust in AI and Autonomous Systems

D3-3-4 (SweCog) **Raphaël Fargier**.
The influence of contextual variability on learning novel words: Does the type of variability matter?

AIC&SweCog 2022

8th International Workshop on Artificial Intelligence and Cognition (AIC) &
17th Conference of the Swedish Cognitive Science Society (SweCog)

15-17 June 2022
Örebro University
Sweden

Organising Committee:

Hadi Banaee, Örebro University, Sweden (AIC Co-Chair, SweCog Co-Chair)

Alessandro Saffiotti, Örebro University, Sweden (AIC Co-Chair)

Amy Loutfi, Örebro University, Sweden (AIC Co-Chair)

Antonio Lieto, University of Turin, Italy (AIC Co-Chair)

Erik Billing, University of Skövde, Sweden (SweCog Co-Chair)

Local Assistants (Örebro University, Sweden)

Jasmin Grosinger, Mohamadreza Faridghasemnia
Sushanth Kalidindi, Gibson Chimamiwa, Olga Mironenko
Ingela Fransson, Elin Sandberg

http://aic20.aass.oru.se/