Imperial College London

HLC Newsletter

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this issue

Ute Schmid

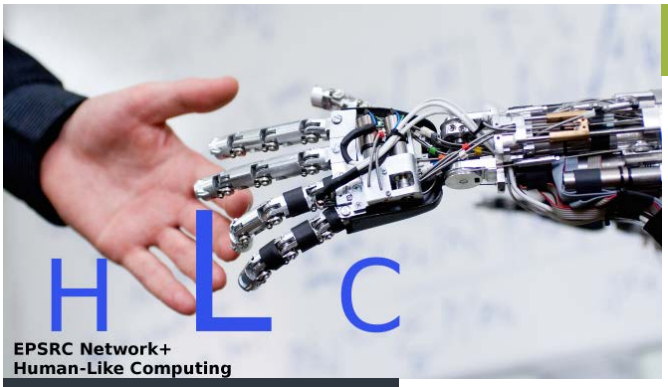
Ute Schmid has become head of the Fraunhofer IIS Research Group Explainable AI https://www.iis.fraunhofer.de/en/ff/sse/imaging-and- analysis/eki.html

Ute Schmid has been accepted into the board of directors of the Bavarian Institute for Digital Transformation https://www.bidt.digital/en/board-of-directors/

Awards

It is a great pleasure to announce that Ute Schmid, University of Bamburg has been awarded the Rainer-Markgraf-Prize 2020. The prize includes a monetary award of €20,000 and honours outstanding projects and impressive achievements in education in Northern Bavaria. Ute Schmid was nominated by her University and by the City of Bamberg for her committed public engagement activities in the area of artificial intelligence to schools, companies, as well as to the general public.

Read further (in German only or google translate): https://nachrichten.idw-online.de/2020/10/05/ute-schmid-erhaelt-rainer-markgraf-preis-2020/



HLC Network+ Year 3 Call Results

Kick-Start Awards 2020

Denis Mareschal

Frank Guerin

Andrew Gilbert

We are pleased to announce the outcome for our Year 3 Call as follows:

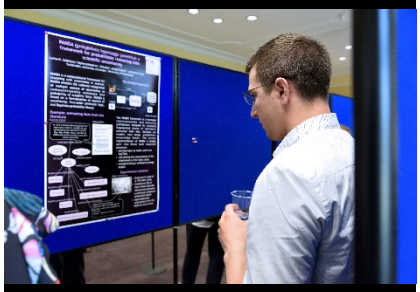
- Denis Mareschal, Birkbeck, University of London has been awarded £60K for his Kick-Start proposal entitled "Generating Explicit Explanations from Deep Reinforcement Learning Systems Using Complementary Learning Systems Theory"
- Frank Guerin and Andrew Gilbert, University of Surrey have been awarded £60K for their Kick-Start proposal entitled "Top-down and Bottom-up Reasoning in Recognising Activity in Video".
- Faisal Mushtaq, University of Leeds has been awarded £2K for his travel proposal entitled "Developing a Turing Test for Human-Like Sensorimotor Control"
- Professor Peter Flach, University of Bristol has been awarded £2K for his travel proposal entitled "Human-Centred Transparency of Intelligent System"

Travel Awards 2020

Faisal Mushtaq

Peter Flach

Top journals, conference papers and publications



We know of the following papers recently published by members of the network:

- Argumentation as a Framework for Interactive Explanations for Recommendations. Antonio Rago, Oana Cocarascu, Christos Bechlivanidis and Francesca Toni. KR 2020 https://kr2020.inf.unibz.it/

- L. Ai, S.H. Muggleton, C. Hocquette, M. Gromowski, and U. Schmid. Beneficial and harmful explanatory machine learning. *Machine Learning*, 2020. In Press, available http://arxiv.org/abs/2009.06410

- A. Cropper, S. Dumancic, and S.H. Muggleton. Learning higher-order programs through predicate invention. In *Proceedings of the 34th Conference on Artificial Intelligence (AAAI 2020)*, pages 13655-13658. AAAI, 2020.

- A. Cropper, S. Dumancic, and S.H. Muggleton. Turning 30: New ideas in inductive logic programming. In *Proceedings of the 29th International Joint Conference Artificial Intelligence (IJCAI 2020)*, pages 4833-4839. IJCAI, 2020.

- A. Cropper, R. Morel, and S.H. Muggleton. Learning higher-order logic programs. *Machine Learning*, 109:1289-1322, 2020.

- C. Hocquette and S.H. Muggleton. Complete bottom-up predicate invention in meta-interpretive learning. In *Proceedings of the 29th International Joint Conference Artificial Intelligence (IJCAI 2020)*, pages 2312-2318. IJCAI, 2020.

- A. Cropper, R. Evans, M. Law: Inductive general game playing. Machine Learning, 109(7): 1393-1434 (2020). https://arxiv.org/pdf/1906.09627.pdf

- A. Cropper, S. Dumancic: Learning Large Logic Programs By Going Beyond Entailment. Proceedings of the 29th International Joint Conference on Artificial Intelligence (IJCAI20). https://arxiv.org/pdf/2004.09855.pdf

- A. Cropper: Forgetting to Learn Logic Programs. Proceedings of the 34th AAAI Conference on Artificial Intelligence (AAAI20). https://arxiv.org/pdf/1911.06643.pdf

Media

Nick Chater

Stephen Muggleton

New Book! *Human-Like Machine Intelligence*

We are pleased to announce that a new book, Human-Like Machine Intelligence, edited by Stephen Muggleton and Nick Chater, and with contributions from many people in this network, and their collaborators, has been submitted in final form to Clarendon Press, an imprint of Oxford University Press, as part of the well-known and long-running Machine Intelligence series. We anticipate a publication date early in 2021.

The aim of the book is to bring together leading researchers in artificial intelligence and cognitive science with the goal of re-establishing the deep connection between these disciplines that was so important in the early development of computational theories of intelligence, and which, we believe, is likely to be equally crucial in the future development of both fields. To capture aspects of human intelligence that have resisted data intensive methods, such as neural networks, there will be a need for greater representational richness, and a deeper understanding of the knowledge and processes that allow the human brain to be such a powerful and flexible computational machine--- and the challenge of building the next generation of richer computational models is largely the same, whether the goal is to “engineer” machines with human level intelligence (as in AI), or to “reverse engineer” how human intelligence is achieved by the brain (as in cognitive science).

The scope of the book is quite broad, with 24 chapters ranging from questions of the meaning of intelligence, and how we might guard against the danger of creating machines that are smarter than we are, to models of specific cognitive process, from communication, vision, reasoning and explanation, game-playing, social behaviour and many more.

We hope that both represents the state-of-the-art an interface between artificial intelligence and cognitive science---but also helps encourage researchers from both disciplines to work closely together to help tackle the challenge of creating truly human-like intelligence.

Nick Chater & Stephen Muggleton

Muggleton, S. & Chater, N. (in press). *Human-Like Machine Intelligence*. Oxford, UK: Clarendon Press.

Awards, media and funding

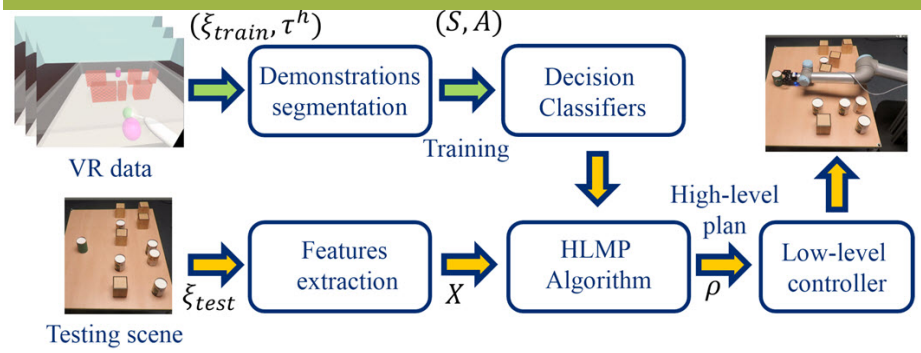
Congratulations to Alaa Alahmadi, who was Highly Commended in the recent IET Healthcare Technologies Student and Early Career Awards. Alaa's PhD work, supervised by Caroline Jay, focuses on improving ECG interpretation, using an empirical understanding of how humans perceive signal data. Her prototype algorithm that vastly improves automated detection of 'QT-prolongation' (an indicator of potential sudden cardiac death) will be published in the upcoming 'Human-Like Machine Intelligence,' Muggleton & Chater, Eds., Oxford University Press.

Alaa Alahmadi

Meetings and Events

A new edition of the Dagstuhl Seminar on "Approaches and Applications of Inductive Programming" has been accepted for May 2021. Altogether, 92 proposals competed for the available slots and were carefully evaluated by the Scientific Directorate of Dastuhl. The seminar will be organised by Ute Schmid together with Andrew Cropper, Richard Evans and Luc de Raedt. It is the fifth time that the bi-annual AAIP event will be held as a Dagstuhl Seminar and the 9th time over all. AAIP started as a workshop at ICML 2005 in Bonn with Stephen Muggleton as keynote speaker. Here is the link to the previous Dagstuhl Seminar: https://www.dagstuhl.de/en/program/calendar/semhp/?semnr=19202

Caroline Jay



Top journals, conference papers and publications

Further recent papers published by members of the network:

- Brookes J, Warburton M, Alghadier M, Mon-Williams M, Mushtaq F. 2020. Studying human behavior with virtual reality: The Unity Experiment Framework. *Behavior Research Methods.* **52**(2), pp. 455-463 https://link.springer.com/article/10.3758/s13428-019-01242-0

- Al-Saud LM, Mushtaq F, Mann RP, Mirghani I, Balkhoyor A, Harris R, Osnes C, Keeling A, Mon-Williams MA, Manogue M. 2019. Early assessment with a virtual reality haptic simulator predicts performance in clinical practice. *BMJ Simulation & Technology Enhanced Learning.* https://stel.bmj.com/content/6/5/274

- McDougle SD, Butcher PA, Parvin D, Mushtaq F, Niv Y, Ivry RB, Taylor JA. 2019. Neural Signatures of Prediction Errors in a Decision-Making Task are Modulated by Action Execution Failures. *Current Biology.* **29**(10), pp. 1606- 1613.e5. https://www.sciencedirect.com/science/article/pii/S0960982219304099?via%3Dihub

- Giles OT, Shire KA, Hill LJB, Mushtaq F, Waterman A, Holt RJ, Culmer PR, Williams JHG, Wilkie RM, Mon-Williams M. 2018. Hitting the target: Mathematical attainment in children is related to interceptive timing ability. *Psychological Science.* **29**(8), pp. 1334-1345 . https://journals.sagepub.com/doi/10.1177/0956797618772502

- Maloca PM, de Carvalho JER, Heeren T, Hasler PW, Mushtaq F, Mon-Williams M, Scholl HPN, Balaskas K, Egan C, Tufail A, Witthauer L, Cattin PC. 2018. High-Performance Virtual Reality Volume Rendering of Original Optical Coherence Tomography Point-Cloud Data Enhanced With Real-Time Ray Casting. *Translational Vision Science & Technology.* **7**(4). https://tvst.arvojournals.org/article.aspx?articleid=2687657

A Hooke for Human-Like Computing

Alan Bundy

I'm delighted to report that the Royal Society have accepted The Human-Like Computing Network+'s application to hold a Hooke Meeting. These are prestigious, two-day scientific meetings named after Robert Hooke, the Royal Society's first Curator of Experiments.

https://makingscience.royalsociety.org/s/rs/people/fst00009590

They are held in the Royal Society's headquarters in Carlton House Terrace. The proceedings are published in the Philosophical Transactions of the Royal Society – the World's first scientific journal.

Our meeting is called *Cognitive Artificial Intelligence* and is designed as an opportunity for discussion between the AI and Cognitive Science communities. The Covid-19 pandemic has forced the Royal Society to cancel some of its meetings or to make them virtual. It's important for the Network+ that our meeting promotes informal mixing between the two communities, so we've asked for it to be held in 2022, between April and October, by which time we hope the pandemic will be sufficiently under control that face to face meetings are once more possible. The exact date will be determined by the Royal Society. We'll publicise it as soon as possible. It will be held towards the end of the Network+, so will be a fitting way to round off our project.

Hooke meeting applications are required to include a list of proposed speakers, so much of the programme is already determined. We have recruited a distinguished, international line-up of researchers in human-like computing: Josh Tenenbaum, Ulrike Hahn, Ellie Pavlick, Amy Perfors, Noah Goodman, Rebecca Saxe, Leslie Pack Kaelbling, Wolfgang Wahlster and Hyowon Gweon, as well as Stephen Muggleton, Nick Chater and myself. We hope to see you all there.

Carlton House Terrace, the Royal Society