

Maria M. Hedblom

COGNITIVE SCIENTIST AND THEORETICAL COMPUTER SCIENTIST

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Experience

Tenured Assistant Professor in Artificial Intelligence

8/2021 –

JÖNKÖPING UNIVERSITY, JÖNKÖPING ARTIFICIAL INTELLIGENCE LABORATORY

Jönköping, Sweden

- Working on several research projects, including industry collaborations.
- Teaching in the AI Engineering Master.
- Organised several international conferences.

Postdoctoral Researcher in Cognitive Robotics

2/2021 – 7/2021

UNIVERSITY OF BREMEN, INSTITUTE FOR ARTIFICIAL INTELLIGENCE

Bremen, Germany

- Working in the EASE project on cognitive robotics for everyday activities.
- Working in the MUHAI project on formal semantics for human-centred AI.
- Co-authored grant applications.
- Organised scientific conferences.

Founding Member of a Tech Start-up

10/2018 – 01/2020

NOVELTY FACTORY KG: PHOTOGENIQ

Vienna, Austria

- AI start-up project in computational creativity, working on taking generative ML into the creative industries.
- Tasks included: Successfully acquiring grant funding, performing market and user analyses, designing business models, preparing training data for GAN algorithms and general product development.

Postdoctoral Researcher in Theoretical Computer Science

1/2018 – 1/2019

FREE UNIVERSITY OF BOZEN-BOLZANO, THE KRDB RESEARCH CENTRE FOR KNOWLEDGE AND DATA

Bozen-Bolzano, Italy

- Working in the OCEAN project on ontology-driven conceptual modelling.
- Performed usability tests on ontology algorithms to improve information retrieval.
- Investigated the most appropriate formal representation of events.
- Co-authored grant applications. So far, funds accumulating to approx. 100 000 € have been acquired.
- Organised several scientific meetings gathering hundreds of people.
- Co-edited conference proceedings

Researcher and University Lecturer

8/2012 – 6/2017

FREE UNIVERSITY OF BOZEN-BOLZANO; OTTO-VON-GUERICKE UNIVERSITY MAGDEBURG; UNIVERSITY OF LINKÖPING

Europe

- Taught bachelor and master level courses in computer science, cognitive science and scientific writing.
- Supervision of students, some resulting in publications.

Education

PhD. in Cognitively-Inspired AI and Computational Creativity

4/2014 – 3/2018

OTTO-VON-GUERICKE UNIVERSITY MAGDEBURG, INSTITUTE OF KNOWLEDGE AND LANGUAGE ENGINEERING

Magdeburg, Germany

- An interdisciplinary research agenda focused on spatiotemporal relationships and their role in human conceptualisations, natural language and metaphors with the purpose to see how it can be used to advance the state of AI.
- Graduated with Magna Cum Laude (*with great honours*), equal to a 1.0.
- Authored over 20 peer-reviewed publications.
- Co-authored research proposals and project reports.
- Performed collaborative work with researchers from several international universities.
- Presented research at over 20 conferences and spoke as an invited speaker at several research institutes.
- Organised and chaired over 10 scientific conferences and workshops.

M.Sc. in Cognitive Science

8/2012 – 11/2013

UNIVERSITY OF LINKÖPING, DEPARTMENT OF COMPUTER AND INFORMATION SCIENCE

Linköping, Sweden

- Worked on the teaching staff.
- Wrote my master thesis at the University of Osnabrück, Germany.
- Main subjects: Computer Science, Linguistics and Psychology.

B.Sc. in Cognitive Science

9/2009 – 9/2013

UNIVERSITY OF LINKÖPING, DEPARTMENT OF COMPUTER AND INFORMATION SCIENCE

Linköping, Sweden

- 9/2011-9/2012: International exchange year at the University of Osnabrück, Germany.
- 06/08 - 06/10: Sat as Chairman for *Kårrullen*; the university's largest culture association, yearly turnover: >10 000 €.
- Main subjects: Research Methodology, Computer Science and Psychology.

Selected Skills

Research	Statistical Analysis, Quantitative-, Qualitative- and Ethnographic Methodology, Communication and Semantic Analysis, Ontology and Logic, Cognitive and Conceptual Modelling, Eye-Tracking,
Computer	Microsoft Office, PowerPoint, Prezi, Python Programming, LaTeX, Wordpress, Photoshop
Soft	Teaching, Interpersonal Communication, Leadership, Adaptability, Teamwork, Positive Outlook, Logical Thinking
Languages	C2: Swedish, English; B2: German; A2: Spanish, Italian, Japanese

Committees and Organisation

8/2022	Local organiser / Main chair , The Joint Ontology Workshops.	Jönköping, Sweden
6/2022	Program Chair , International Conference on Computational Creativity.	Bozen, Italy
5/2022	Program Committee Member , European Semantic Web Conference (ESWC 2022)	Hersonissos, Greece
5/2022	Program Committee Member , 1st Workshop on Modular Knowledge (MK2022)	Hersonissos, Greece
4/2022	Organiser , The Sixth Image Schema Day Workshop.	Jönköping, Sweden
12/2021	Program Committee Member , The Eleventh International Conference on Knowledge Capture (K-Cap 2021)	Virtual
2021	Mentor , Google Summer of Code. Part of the Red Hen Lab.	Virtual
09/2021	Chair , Cognition And OntologieS (CAOS V). Workshop at JOWO@BOSK 2021.	Bozen, Italy
11/2021	Program Committee Member , Technology, Mind and Society. by the American Psychological Association.	Virtual
10/2017-03/2022	Hanse-Wissenschaftskolleg (HWK) Study Group Member , Modeling Conceptual Knowledge and Conceptual Change	Delmenhorst, Germany
03/2021	Co-organiser and Moderator , TransAIR. Workshop on Robotics.	Virtual / Bremen, DE
09/20-21	Publicity-Chair , 11th Formal Ontology in Information Systems (FOIS).	Bozen, Italy
06/2020	Program Committee Member , European Semantic Web Conference (ESWC 2021)	Hersonissos, Greece
05/2020	Program Committee Member , European Semantic Web Conference (ESWC 2020)	Heraklion, Greece
05/2020	Program Committee Member , European Semantic Web Conference (ESWC 2020)	Heraklion, Greece
11/2019	Co-Chair , Tricolore 2019	Bozen, Italy
11/2019	Program Committee Member , K-Cap 2019: The Tenth International Conference on Knowledge Capture	Marina del Rey, CA, US
09/2019	Web-Chair , Conference on Knowledge Engineering and Knowledge Management (EKAW).	Bozen, Italy
09/2019	Co-Chair , Cognition and OntologieS (CAOS 4). Workshop at JOWO 2019.	Graz, Austria
09/2019	Program Committee Member , SHAPES 5.0: The Shape of Things	Graz, Austria
12/2018	Local Organiser , TriCoLore: ISD, C3GI and SCORE.	Bozen, Italy
11/2018	Program Committee Member , EKAW 2018: International Conference on Knowledge Engineering and Knowledge Management	Nancy, France
09/2018	Co-Chair , Early Career Symposium (ECS) at FOIS 2018.	Cape Town, SA
09/2018	Co-Chair , Cognition and OntologieS (CAOS 3). Workshop at JOWO 2018.	Cape Town, SA
09/2018	Program Committee Member , EPINON 2018: Second International Workshop on Epistemology in Ontologies @FOIS	Cape Town, SA
07/2018	Program Committee Member , CreaCogMod 2018: Computational Methods and Systems for the Cognitive Modelling and Support of Creativity and Creative Problem Solving @COGSCI	Madison, Wis, US
09/2017	Chair , Image Schema Day III (ISD3). Workshop at JOWO 2017.	Bozen, Italy
09/2017	Program Committee Member , EPINON 2017: First International Workshop on Epistemology in Ontologies @JOWO	Bolzano, Italy
04/2017	Chair , Cognition and OntologieS (CAOS 2). Symposium at the AISB convention.	Bath, UK
08/2016	Co-Organiser , Image Schema Day II. Workshop on image schemas and conceptual blending.	Bozen, Italy
07/2016	Chair , Cognition and OntologieS (CAOS). Workshop at FOIS 2016.	Anney, France
07/2016	Publicity Chair , The Joint Ontology Workshop (JOWO) 2016.	Anney, France
06/2016	Local Co-Organiser , IAOA'S 3rd Interdisciplinary Summer School on Ontological Analysis.	Bozen, Italy
10/2015	Chair , Image Schema Day. Workshop on conceptual primitives.	Bozen, Italy
05/2013	Publicity Chair , Kvit 2013. A science conference organised entirely by students.	Linköping, Sweden

Invited Speaker

Start-up Accelerator Program

SCIENCE PARK

Talk: A Tiny Taste of Ethics of AI

Jönköping, Sweden

June 8th, 2022

EASE fall school

UNIVERSITY OF BREMEN

Talk: From Sense to Reason – Using Image Schemas to Intelligently Reason about Objects and Events

Bremen, Germany (Virtual)

November 10th, 2021

AI-Dagen

ELMIA CONFERENCE VENUE

Invited to moderate the event as a AI scientist

Jönköping, Sweden

September 30th, 2021

Invited presenter at the institute

JÖNKÖPING AI LAB

Talk: Image Schemas: Puzzle pieces of thought to ground meaning in AI

Jönköping, Sweden

October 27th, 2020

MUHAI kick-off meeting

VENICE INTERNATIONAL UNIVERSITY

Talk: What's the meaning of this? Representing meaning with image schemas

Venice, Italy

October 5-9, 2020

Invited presenter at the institute

IIIA-CSIC

Talk: From embodied cognition to formal representation

Bellaterra, Spain

February 7, 2017

Invited presenter at the institute

TECHNISCHE UNIVERSITÄT DRESDEN

Talk: Image schemas in computational concept invention

Dresden, Germany

January 5, 2017

Invited presenter at the institute

IIIA-CSIC

Talk: Concept invention for AI using the cognitive theories of image schemas and conceptual blending

Bellaterra, Spain

April 14, 2016

Teaching

Uni-Bremen: University of Bremen, Germany; **JU:** Jönköping University, Sweden; **UNIBZ:** Free University of Bozen-Bolzano, Italy; **OVGU:** Otto-von-Guericke University Magdeburg, Germany; **LIU:** University of Linköping, Sweden

2021-	PhD thesis co-supervision , Co-supervisor to Kaviya Dhanabalachandran at University of Bremen.	<i>Uni-Bremen</i>
2022	Master thesis supervision , Supervised two master thesis projects in computer vision.	<i>JU</i>
2022	Ethics of Artificial Intelligence , Course for AI Engineering masters. Together with Prof. Riveiro.	<i>JU</i>
2021	Research Methods for Intelligent Systems , Course for AI Engineering masters.	<i>JU</i>
2021	Knowledge Representation and the Semantic Web , Course for AI Engineering masters. Together with Dr. Tan.	<i>JU</i>
2021	Mentoring at Google Summer of Code , Mentoring for The International Distributed Little Red Hen Lab	<i>Virtual</i>
2017	Thesis supervision , Master thesis supervision on conceptual modelling.	<i>UNIBZ</i>
2017	Technical and scientific communication , Course for computer science masters. Together with Prof. Guizzardi.	<i>UNIBZ</i>
2017	Survey of research on the frontiers of computer science , Course for computer science masters. Together with M. Thosar.	<i>OVGU</i>
2015	Seminar on computational creativity , Course for computer science masters. Together with Dr. Neuhaus.	<i>OVGU</i>
2014-15	Study project on image schema formalisation , For computer science masters. Together with Prof. Kutz.	<i>OVGU</i>
2013	Programming and logic , Course for cognitive science bachelors. Role: laboratory assistant.	<i>LIU</i>
2012	Introduction to cognitive science , Course for cognitive science bachelors. Role: laboratory assistant.	<i>LIU</i>
2012	Cognitive modelling , Course for cognitive science bachelors. Role: laboratory assistant.	<i>LIU</i>
2012	Programming and discrete mathematics , Course for cognitive science bachelors. Role: laboratory assistant.	<i>LIU</i>

Publications

The five papers that are most relevant to this application is highlighted with a *.

Books and Book Chapters

Hedblom, M.M., *Methodological reflection of the documentanalysis of .co.kr from the %WRONG Browser series*. In Hinterwaldner et al. (Eds.), *Navigation Special Issue: The Digital Image* (To appear)

* Hedblom, M. M., “*Image Schemas and Concept Invention: Cognitive, Logical, and Linguistic Investigations*”. Cognitive Technologies book series, Springer Verlag ISBN 978-3-030-47328-0

Hedblom, M. M., Kutz, O. and Neuhaus, F., “*Image schemas in Concept Invention*”. In Confalonieri et al. (Eds.), *Concept Invention: Foundations, Implementation, Social Aspects and Applications*, Springer Verlag (2018).

Hedblom, M. M., “*Image Schemas and Concept Invention: Cognitive, Logical, and Linguistic Investigations*”. Doctoral Thesis, defended March 19, 2018.

Articles in Peer-Reviewed Scientific Journals

Höffner, S, Porzel, R., Hedblom, M. M., Pomarlan, M., Cangalovic, V. S., Pfau, J., Bateman, J. and Malaka, R., *Deep Understanding of Everyday Activity Commands for Household Robots*, *Semantic Web Journal* 13(5) (To appear)

* Hedblom, M. M., Kutz, O., Peñaloza, R. and Guizzardi, G., “*Image schema combinations and complex events*”. *Künstliche Intelligenz (Special issue on Cognitive Reasoning)* 33: 279–291 (July, 2019).

Besold, T. R., Hedblom, M. M. and Kutz, O., “*A narrative in three acts: Using combinations of image schemas to model events*”. *Biological Inspired Cognitive Architectures* 19:10-20 (2017).

Hedblom, M. M., Kutz, O. and Neuhaus, F., “*Image schemas in computational conceptual blending*”. *Cognitive Systems Research* 39:42–57 (2016).

Hedblom, M. M., Kutz, O. and Neuhaus, F., “*Choosing the Right Path: Image Schema Theory as a Foundation for Concept Invention*”. *Journal of Artificial General Intelligence* 6(1):21–54 (2015).

Articles in Peer-Reviewed Conference Proceedings

Righetti, G., Porello, D., Troquard, N., Kutz, O., Hedblom M. M. and Galliani, P., *Asymmetric Hybrids: Dialogues for Computational Concept Combination* (Invited Extended Abstract), *IJCAI - Sister Conferences Best Paper Track*, Vienna Austria (July, 2022) (To appear)

Hedblom, M. M., and Neuhaus, F., *Visualising Image Schemas: A Preliminary Look on the Diagrammatic Image Schema Language (DISL)*, In Proc. of ISD6, Jönköping, Sweden, (April, 2022)

Dhanabalachandran, K., Hedblom, M. M., and Beetz, M., *Getting On Top of Things: An Extended Abstract on Robotic Object Stacking using Image-Schematic Reasoning*, In Proc. of ISD6, Jönköping, Sweden, (April, 2022)

* Pomarlan, M., Hedblom, M. M., and Porzel, R., *Panta Rhei: Curiosity-Driven Exploration to Learn the Image-Schematic Affordances of Pouring Liquids*, In Proc. of the 29th AISC, Virtual (Dublin, Ireland) CEUR-WS Vol 3105 (December, 2021)

* Dhanabalachandran, K., Hassouna, V., Hedblom, M. M., Kuempel, M., Leusmann, N., and Beetz, M., *Cutting Events: Towards Autonomous Plan Adaption by Robotic Agents through Image-Schematic Event Segmentation*, In Proc. of The 11th Int. Conf. on Knowledge Capture, Virtual. K-Cap 2021, (December, 2021) doi:10.1145/3460210.3493585

Righetti, G., Porello, D., Troquard, N., Kutz, O., Hedblom M. M. and Galliani, P., “*Asymmetric Hybrids: Dialogues for Computational Concept Combination*”. In Brodaric, B., Neuhaus, F. (eds) *Formal Ontology and Information Systems. FOIS 2021*. IOS Press, Bolzano, Italy (September, 2021)

Hedblom M. M., Righetti, G., and Kutz, O., “*Deciphering The Cookie Monster: A case study in impossible combinations*”. Proc. of Int. Conf. on Computational Creativity. ICCO 2021, p. 222-225. Mexico City, Mexico (virtual), (September, 2021).

* Hedblom, M. M., Pomarlan, M., Porzel, R., Malaka, R., and Beetz, M., “*Dynamic Action Selection Using Image Schema-based Reasoning for Robots*”. Proc. of JOWO, Bolzano, Italy (September, 2021). (Submitted)

Hedblom, M. M. and Kutz, O., “*Conceptual Puzzle Pieces: An image schema experiment on object conceptualisation*”. In Bella G., Bouquet P. (eds) *Modeling and Using Context. CONTEXT 2019*. LNCS, vol 11939. Springer, p. 98-111, Trento, Italy (November, 2019)

- Hedblom, M. M. and Kutz, O., “*gninaeM neddiH: Using image schema violations to expose hidden semantical structures in metaphors*”. Proc. of JOWO, Graz, Austria (September, 2019)
- Hedblom, M. M., Kutz, O., Peñaloza R. and Guizzardi, G., “*Hold—Drop—Smash: Image Schema Combinations and Complex Events*”. Proc. at AIC 2019, Manchester, UK, (September, 2019)
- Guizzardi, G., Figueiredo, G., Hedblom, M. M., and Poels, G., *Ontology-Based Model Abstraction*. Proc. IEEE Thirteen International Conference on Research Challenges in Information Science (April, 2019).
- Verdonck, M., Hedblom, M. M., Guizzardi, G., Figueiredo, G., Gailly, F., and Poels, G., *An Empirical Study Concerning Ontology-Driven Modularization and Ontology-Neutral Modularization Techniques*. Proc. of VMBO (2019).
- Hedblom, M. M., Kutz, O., Peñaloza, R. and Guizzardi, G., *What’s Cracking? How image schema combinations can model conceptualisations of events*. Proc. of TriCoLore (December, 2018).
- Kutz, O., Troquard, N., Hedblom, M. M. and Porello, D., “*The Mouse and the Ball: Towards a cognitively-based and ontologically-grounded logic of agency*”. Proc. of FOIS (2018).
- Hedblom M. M., Peñaloza, R., Kutz, O. and Guizzardi, G., “*Under the Super-Suit: What Superheroes Can Reveal About Inherited properties in Conceptual Blending*”. Proc. of ICCS, Salamanca, Spain, (2018) p. 216-223.
- Figueiredo, G., Duchardt, A., Hedblom, M. M., and Guizzardi, G., “*Breaking into Pieces: An Ontological Approach to Conceptual Model Complexity Management*”. Proc. of RCIS, Nantes, France (2018).
- Hedblom, M. M., Gromann, D. and Kutz, O., “*In, Out and Through: Formalising some dynamic aspects of the image schema Containment*”. Proc. of KKR@SAC, Pau, France, (2018) p. 918-925.
- Gromann, D. and Hedblom, M. M., “*Body-Mind-Language: Multilingual Knowledge Extraction Based on Embodied Cognition*”. Proc. of AIC, CEUR-WS: Vol-2090, Lanarca, Cyprus (2017).
- Gromann, D. and Hedblom, M. M., “*Image Schemas and Conceptual Dependency Primitives: A Comparison, Jamie Macbeth*”. Proc. of JOWO, Bolzano, Italy (2017).
- Hedblom, M.M., “*Beneath the Paint: A Visual Journey through Conceptual Metaphor Violation*”. Proc. of JOWO, Bolzano, Italy (2017).
- Hedblom, M. M., Kutz, O., Mossakowski, T., and Neuhaus, F., “*Between Contact and Support: Introducing a logic for image schemas and directed movement*”. Proc. of AI*IA, Bari, Italy (2017).
- Gromann, D. and Hedblom, M. M., “*Kinesthetic Mind Reader: A Method to Identify Image Schemas in Natural Language*”. Proc. of Advancements in Cognitive Systems (ACS), Troy, New York, US (2017).
- Gromann, D., Hedblom, M. M., “*Breaking Down Finance: A method for concept simplification by identifying movement structures from the image schema PATH-following*”. Proc. of the Joint Ontology Workshops (JOWO), Annecy, France (2016).
- Kutz, O., Neuhaus, F., Hedblom, M. M., Mossakowski, T. and Codescu, M., “*Ontology Patterns with DOWL: The Case of Blending*”. Proc. of DL Workshop, Cape Town (2016).
- Hedblom, M. M. and Kutz, O., “*Shape up, baby! Perception, image schemas and shapes in concept formation*”. Proc. of Shapes 3.0 Workshop, Lanarca (2015).
- Hedblom, M. M., Kutz, O. and Neuhaus, F., “*Image schemas as families of theories*”. Proc. of C3GI Workshop, Istanbul, p. 19-33 (2015).
- Hedblom, M. M., Kutz, O., and Neuhaus, F., “*On the cognitive and logical role of image schemas in computational conceptual blending*”. Proc. of AGI, Torino, p. 110-121 (2014).