Marc van Zee

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Senior Researcher/Engineer at Google Brain

- 6+ years of experience coding and research at Google Brain.
- Co-lead of the Flax team (10 members) since 2022.
- Published 32 research papers at top venues (e.g.: AIJ, ICLR, AAAI, IJCAI, ECAI, AAMAS, …).
- Research interests: Applying techniques from Knowledge Representation and Reasoning to Deep Learning through Large Language Models. Building infrastructure to interface Large Language Models with other tools such as Knowledge Graphs, inference engines, or other Information Systems.

EDUCATION

2014-2017 **Ph.D. – Computer Science,** *5/5 (outstanding)*
University of Luxembourg, Luxembourg, LUX
Thesis: "Rational Architecture = Architecture from a Recommender Perspective"
Internship at Google Pittsburgh, USA (2016) -- Exchange to Stanford University, USA (2015)

2011-2013 **MSc.– Artificial Intelligence,** *cum laude*
Utrecht University, Utrecht, NL
Graduate Project: "Implementing Temporal Action Logics" at Linköping University, Sweden.

2005-2009 **BSc.– Industrial Design**
Eindhoven University of Technology, Eindhoven, NL
Participant in the Honours Programme

EMPLOYMENT HISTORY

2022-now **Senior Researcher/Engineer**, Google Brain, Copenhagen, DK.
2020-2022 **Researcher/Engineer**, Google Brain, Amsterdam, NL.
2017-2020 **Researcher/Engineer**, Google Brain, Zurich, CH.
2016 **Software Engineer (internship)**, Google Pittsburgh, USA.
2011-2013 **Teaching Assistent** , Utrecht University, Utrecht, NL
2010-2011 **Back-end Web developer (part-time)**, Dutch Association of Pediatrics, Utrecht, NL.
2009 **Developer (internship)**, Fablab, Amsterdam, NL

SELECTED PROJECTS

FLAX, GOOGLE BRAIN, COPENHAGEN (2020-now)

Role: Flax lead (2022-now), Flax core developer (2020-2022)
Technology: Python, C++, DL, LLMs

About. Flax is a neural network library built on top of JAX. We provide abstractions for training machine learning models. Flax is used both in the open source community (like HuggingFace) and internally Google (like PaLM, Imagen, Scenic, Big Vision, and T5X).
My role. Flax started in early 2020, and I joined a few months after. We grew from 4 to 10 member and now support most of Google Research. I helped many users and led a number of projects such as JAX on the web, and a HuggingFace hackathon (over 800 participants). We won the Google Tech Impact award in 2021, and I received over 15 peer bonuses and 5 spot bonuses for my impact in the project.

T5X, GOOGLE BRAIN, AMSTERDAM (2020-2022)

Role: Technical contributor
Technology: Python, LLMs, DL

About. T5X is a modular, composable, research-friendly framework for high-performance sequence models at many scales.
My role. I was one of the main technical contributors to T5X, and I was responsible for improving the JAX model parallelism logic, running experiments and overall code improvements. To learn more, see the T5X Paper.

ELYSIUM, GOOGLE BRAIN, ZURICH (2017-2022)
Role: Engineer/Researcher
Technology: Javascript, C++, NLP, DL

About. Elysium consisted of a team of 13 members trying to rebuild the Google Assistant from the ground up using ideas from description logic. We built and end-to-end prototype for a chatbot and published two papers (1, 2).
Initially,
My role. I was responsible for various aspects of the protoype (e.g.: front-end logic, coreference resolution, a context abstraction), but once we started using more Deep Learning, I led setting up the infrastructure based on T5 and doing all relevant experiments for both publications.

PUBLICATIONS

Adam Roberts, Hyung Won Chung, Anselm Levskaya, Gaurav Mishra, James Bradbury, Daniel Andor, Sharan Narang, Brian Lester, Colin Gaffney, Afroz Mohiuddin, Curtis Hawthorne, Aitor Lewkowycz, Alex Salcianu, Marc van Zee *et al.* 2022. "Scaling Up Models and Data with `t5x` and `seqio`". *arXiv:2203.17189*.

Marc van Zee, Floris Bex, and Sepideh Ghanavati. 2021. "RationalGRL: A framework for argumentation and goal modeling". In *Argument & Computation 12.2: 191-245.*

Marc van Zee, Daniel Furrer, Nathan Scales, Nathanael Schärli. 2020. "Compositional Generalization in Semantic Parsing: Pre-training vs. Specialized Architectures". *arXiv:2007.08970*.

Marc van Zee, Dragan Doder, Leendert van der Torre, Mehdi Dastani, Thomas Icard, Eric Pacuit. 2020. "Intention as Commitment toward Time". In *Artificial Intelligence, Elsevier BV, volume 283*.

Daniel Keysers, Nathanael Schärli, Nathan Scales, Hylke Buisman, Daniel Furrer, Sergii Kashubin, Nikola Momchev, Danila Sinopalnikov, Lukasz Stafiniak, Tibor Tihon, Dmitry Tsarkov, Xiao Wang, Marc van Zee, Olivier Bousquet. 2019. "Measuring Compositional Generalization: A Comprehensive Method on Realistic Data". In *International Conference on Learning Representations (ICLR)*.

Marc van Zee. 2018. "Beyond the Hype: Making Progress on Natural Language Systems" In *Leon50 - Arguing about Logic: Debates in Individual and Collective Reasoning*.

Marc van Zee. 2017. "Rational Architecture: Reasoning about Enterprise Dynamics (PhD Thesis)". *University of Luxembourg. grade: 5/5 (outstanding).*

Leon van der Torre, Marc Van Zee. 2017. "Rational Enterprise Architecture". In International Conference on Industrial, Engineering and Other Applications of Applied Intelligent Systems.

Marc van Zee, Diana Marosin, Sepideh Ghanavati, Floris Bex. 2016. "RationalGRL: A Framework for Rationalizing Goal Models Using Argument Diagrams". In *International Conference on Conceptual Modeling (ER)*.

Marc van Zee, Diana Marosin, Floris Bex, Sepideh Ghanavati. 2016. "The RationalGRL toolset for Goal Models and Argument Diagrams". In *International Conference on Computational Models of Argument (COMMA'16), Demo abstract.*

Marc van Zee, Dragan Doder. 2016. "AGM-Style Revision of Beliefs and Intentions", In *European Conference on Artificial Intelligence (ECAI).*

Diana Marosin, Marc van Zee, Sepideh Ghanavati. 2016. "Formalizing and Modeling Enterprise Architecture (EA) Principles with Goal-oriented Requirements Language (GRL)", In *International Conference on Advanced Information System Engineering (CAiSE).*

Marc van Zee, Dragan Doder. 2016. "AGM-Style Revision of Beliefs and Intentions from a Database Perspective (Preliminary Version)", In *International Workshop on Non-Monotonic Reasoning (NMR)*.

Marc van Zee, Thomas Icard. 2015. "Intention Reconsideration as Metareasoning", In *NeurIPS workshop: Bounded Optimality and Rational Metareasoning*.

Marc van Zee, Dirk van der Linden. 2015. "ARMED: ARgumentation Mining and reasoning about Enterprise architecture Decisions". In *Benelux Conference on Artificial Intelligence (BNAIC)*

Dirk van der Linden, Marc van Zee. 2015. "Insights from a Study on Decision Making in Enterprise Architecture", In *Working Conference on the Practice of Enterprise Modeling (PoEM)*.

Marc van Zee, Floris Bex, Sepideh Ghanavati. 2015. "Rationalization of Goal Models in GRL using Formal Argumentation". In *Requirements Engineering Conferenc (RE)*.

Marc van Zee. 2015. "Rational Architecture = Architecture from a Recommender Perspective (short paper)", In *International Joint Conference on Artificial Intelligence (IJCAI)*.

Marc van Zee, Mehdi Dastani, Dragan Doder, Leendert van der Torre. 2015. "AGM Revision of Beliefs about Action and Time", In *International Joint Conference on Artificial Intelligence (IJCAI)*.

Marc van Zee, Mehdi Dastani, Dragan Doder, Leendert van der Torre. 2015. "Consistency Conditions for Beliefs and Intentions". In *International Symposium on Logical Formalizations of Commonsense Reasoning*.

Silvano Colombo Tosatto, Marc van Zee. 2014. "Bridging Social Network Analysis and Judgment Aggregation". In *International Conference on Social Informatics.*

Marc van Zee, Sepideh Ghanavati. 2014. "Capturing Evidence and Rationales with Requirements Engineering and Argumentation-Based Techniques", In *Benelux Conference on Artificial Intelligence (BNAIC)*.

Marc van Zee, Mehdi Dastani, Yoav Shoham, Leendert van der Torre. 2014. "Collective Intention Revision from a Database Perspective". In *Collective Intentionality Conference*.

Marc van Zee, Patrick Doherty, John-Jules Meyer. 2014. "Encoding Definitional Fragments of Temporal Action Logic into Logic Programming". In *International Workshop on Defeasible and Ampliative Reasoning (DARe)*.

Dirk van der Linden, Marc van Zee. 2014. "On the Semantic Feature Structure of Modeling Concepts: an Empirical Study". In *IEEE Conference on Business Informatics (CBI)*.

Marc van Zee, Georgios Plataniotis, Diana Marosin, Dirk van der Linden. 2014. "Formalizing Enterprise Architecture Decision Models using Integrity Constraints". In *IEEE Conference on Business Informatics (CBI)*.

Pouyan Ziafati, Yehia Elrakaiby, Marc van Zee, Leendert van der Torre, Holger Voos, Mehdi Dastani, John-Jules Meyer. 2014. "Reasoning on Robot Knowledge from Discrete and Asynchronous Observations". In *Knowledge Representation and Reasoning in Robotics*.

Silvano Colombo Tosatto, Marc van Zee. 2014. "Social Network Analysis for Judgment Aggregation". In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*.

Diego Agustin Ambrossio, Alessio Antonini, Yehia Elrakaiby, Dov Gabbay, Marc van Zee. 2013. "Argument Revival in Annotated Argumentation Networks", In *Workshop on Argumentation in Artificial Intelligence and Philosophy: computational and philosophical perspectives (ARGAIP)*.

Natasha Alechina, Tristan Behrens, Mehdi Dastani, Koen Hindriks, Koen Hubner, Fred Jomi, Brian Logan, Hai H. Nguyen, Marc van Zee. 2013. "Multi-Cycle Query Caching in Agent Programming". In *AAAI Conference on Artificial Intelligence*.

Mehdi Dastani, Marc van Zee. 2013. "Belief Caching in 2APL". In *Workshop on Engineering Multi-Agent Systems (EMAS)*.

Marc van Zee. 2013. "Implementing Temporal Action Logics (Master's thesis)". *Utrecht University. grade: summa cum laude*.