Marc van Zee

Senior Research Engineer

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Deep Learning Architect | Leading Development of Scalable AI Models (Veo, Imagen 3, Flax)

Experience

2023–now **Google DeepMind**, *Copenhagen, Denmark*, Senior Research Engineer
Text to image/video. Core contributor of Veo, partial contributor of Imagen 3.

2019–2023 **Google Brain**, *Amsterdam, the Netherlands*, Senior Research Engineer
Flax, a neural network library on JAX. Tech lead since 2021.

2017–2019 **Google Brain**, *Zurich, Switzerland*, Research Engineer
Large language models, compositional generalization in language.

2016 **Google Shopping**, *Pittsburgh, USA*, Software Engineer (PhD internship)
C++ developer.

Education

2014–2017 **PhD in Computer Science**, *University of Luxembourg*, Luxembourg, *5/5 (Outstanding)*
Rational Architecture: Architecture from a Recommender Perspective.
Advisor: Prof. Leon van der Torre

2011-2013 **MSc. in Artificial Intelligence**, *Utrecht University*, the Netherlands, *Cum Laude*
Graduate Project: "Implementing Temporal Action Logics."
Advisors: Prof. John-Jules Meyer, Prof. Patrick Doherty

2005-2009 **BSc. in Industrial Design**, *Eindhoven University of Technology*, the Netherlands
Thesis: "Product Attachment through an Adaptive Lighting System."
Participant in the Honours Programme.

Significant Projects and Accomplishments

2024 **Veo**, Diffusion-based text to video model. Core developer, contributions: architecture development, attention optimizations, large model training.

2024 **Imagen 3**, Diffusion-based text to image model. Contributions: Training infrastructure, implemented optimized flash attention variants for efficient model scaling.

2020-2022 **Flax**, a neural network library used by most large models and frameworks by Google (PaLM, Imagen, Scenic, Big Vision, T5X, ...). We grew from 4 to 10 member and now support most of Google Research. Winner of the Google tech impact award 2021.

2019 **CFQ dataset**, Core developer. A dataset for measuring compositional generalization in language. Related publication: "Measuring Compositional Generalization: A Comprehensive Method on Realistic Data"

Open Source

2022 **T5X**, A modular framework for high-performance training and inference of sequence models at many scales, see repo for a list of co-authors.
https://github.com/google-research/t5x

2021 **JAX for mobile and web using jax2tf**, A library for converting JAX models to Tensorflow, TFlite (mobile) and TF.js (web), with George Necula
https://github.com/google/jax/tree/main/jax/experimental/jax2tf
https://blog.tensorflow.org/2022/08/jax-on-web-with-tensorflowjs.html

2020-2023 **Flax**, A neural network library on JAX, with Jonathan Heek, Anselm Levskaya, Avital Oliver, Andreas Steiner, Ivy Zheng, and Marcus X.
https://github.com/google-research/t5x

Languages

Dutch	Native
English	Full professional
German	Professional Working
Danish	Professional Working

Publications

Anna van Zee, **Marc van Zee**, and Anders Søgaard. Group fairness in multilingual speech recognition models. In Kevin Duh, Helena Gomez, and Steven Bethard, editors, *Findings of the Association for Computational Linguistics: NAACL 2024*, pages 2213–2226, Mexico City, Mexico, June 2024. Association for Computational Linguistics.

Huimin Dong, **Marc van Zee**, Dragan Doder, Xu Li, and Rėka Markovich andc Leon van der Torre. Rights and practical reasoning in deontic logic. In *Proceedings of the 16th International Conference on Deontic Logic and Normative Systems (DEON)*, 2023.

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, and **Marc van Zee** et al. Scaling up models and data with `t5x` and `seqio`. *Journal of Machine Learning Research*, 24(377):1–8, 2023.

Marc van Zee, Floris Bex, and Sepideh Ghanavati. Rationalgrl: A framework for argumentation and goal modeling. *Argument & Computation*, 12(2):191–245, 2021.

Marc van Zee, Daniel Furrer, Nathan Scales, and Nathanael Schärli. Compositional generalization in semantic parsing: Pre-training vs. specialized architectures. *arXiv 2007.08970*, 2021.

Marc van Zee, Dragan Doder, Leendert van der Torre, Mehdi Dastani, Thomas Icard, and Eric Pacuit. Intention as commitment toward time. *Artificial Intelligence*, 283:103270, 2020.

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**, and Olivier Bousquet. Measuring compositional generalization: A comprehensive method on realistic data. In *International Conference on Learning Representations*, 2019.

Leendert van der Torre and **Marc van Zee**. Rational enterprise architecture. In Salem Benferhat, Karim Tabia, and Moonis Ali, editors, *Advances in Artificial Intelligence: From Theory to Practice*, pages 9–18, Cham, 2017. Springer International Publishing.

Sepideh Ghanavati, **Marc van Zee**, and Floris Bex. Argumentation-based methodology for goal-oriented requirements language (GRL). In *Proceedings of the 10th International i* Workshop*, 2017.

Marc van Zee. *Formalising Enterprise Architecture Decision Models*, pages 257–275. Springer International Publishing, Cham, 2017.

Diana Marosin, **Marc van Zee**, and Sepideh Ghanavati. Formalizing and modeling enterprise architecture (EA) principles with goal-oriented requirements language (GRL). In *Proceedings of the CAiSE conference*. Springer, 2016.

Marc van Zee, Diana Marosin, Floris Bex, and Sepideh Ghanavati. The RationalGRL Toolset for Goal Models and Argument Diagrams. In *Computational Models of Argument - Proceedings of COMMA*. IOS Press, 2016.

Marc van Zee and Dragan Doder. AGM-Style Revision of Beliefs and Intentions. In *ECAI 2016 - 22nd European Conference on Artificial Intelligence*. IOS Press, 2016.

Marc van Zee, Diana Marosin, Floris Bex, and Sepideh Ghanavati. Rationalgrl: A framework for rationalizing goal models using argument diagrams. In *Conceptual Modeling - 35th International Conference, ER 2016, Gifu, Japan, November 14-17, 2016, Proceedings*, volume 9974 of *Lecture Notes in Computer Science*, pages 553–560, 2016.

Marc van Zee, Mehdi Dastani, Dragan Doder, and Leendert W. N. van der Torre. Consistency conditions for beliefs and intentions. In *2015 AAAI Spring Symposia*. AAAI Press, 2015.

Marc van Zee and Thomas Icard III. Intention reconsideration as metareasoning. *Workshop on Bounded Optimality and Rational Metareasoning*, 2015.

Dirk van der Linden and **Marc van Zee**. Insights from a study on decision making in enterprise architecture. In *Working Conference on the Practice of Enterprise Modelling (PoEM 2015)*. CEUR-WS.org, 2015.

Marc van Zee, Dragan Doder, Mehdi Dastani, and Leendert W. N. van der Torre. AGM revision of beliefs about action and time. In *Proceedings of the Twenty-Fourth International Joint Conference on Artificial Intelligence, IJCAI 2015*, pages 3250–3256. AAAI Press, 2015.

Marc van Zee. Rational architecture = architecture from a recommender perspective. In *Proceedings of the Twenty-Fourth International Joint Conference on Artificial Intelligence, IJCAI 2015*. AAAI Press, 2015.

Marc van Zee, Floris Bex, and Sepideh Ghanavati. Rationalization of goal models in GRL using formal argumentation. In *23rd IEEE International Requirements Engineering Conference, RE 2015*. IEEE Computer Society, 2015.

Marc van Zee, Mehdi Dastani, Yoav Shoham, and Leendert van der Torre. Collective intention revision from a database perspective. In *Collective Intentionality Conference*, 2014.

Pouyan Ziafati, Yehia Elrakaiby, **Marc van Zee**, Mehdi Dastani, John-Jules Ch. Meyer, Leendert W. N. van der Torre, and Holger Voos. Reasoning on robot knowledge from discrete and asynchronous observations. In *2014 AAAI Spring Symposia*. AAAI Press, 2014.

Silvano Colombo Tosatto and **Marc van Zee**. Social network analysis for judgment aggregation. In *International conference on Autonomous Agents and Multi-Agent Systems, AAMAS*, 2014.

Marc van Zee, Patrick Doherty, and John-Jules Ch. Meyer. Encoding definitional fragments of temporal action logic into logic programming. In *Proceedings of the International Workshop on Defeasible and Ampliative Reasoning, DARe@ECAI*. CEUR-WS.org, 2014.

Silvano Colombo Tosatto and **Marc van Zee**. Bridging social network analysis and judgment aggregation. In *Social Informatics - 6th International Conference*. Springer, 2014.

Marc van Zee, Georgios Plataniotis, Dirk van der Linden, and Diana Marosin. Formalizing enterprise architecture decision models using integrity constraints. In *IEEE 16th Conference on Business Informatics, CBI 2014*. IEEE Computer Society, 2014.

Dirk van der Linden and **Marc van Zee**. On the semantic feature structure of modeling concepts: An empirical study. In *IEEE 16th Conference on Business Informatics, CBI 2014*. IEEE Computer Society, 2014.

Natasha Alechina, Tristan M. Behrens, Mehdi Dastani, Koen V. Hindriks, Jomi Fred Hübner, Brian Logan, Hai H. Nguyen, and **Marc van Zee**. Multi-cycle query caching in agent programming. In *Proceedings of the Twenty-Seventh AAAI Conference on Artificial Intelligence*. AAAI Press, 2013.

Mehdi Dastani and **Marc van Zee**. Belief caching in 2apl. In *Engineering Multi-Agent Systems - First International Workshop, EMAS*. Springer, 2013.

Diego Agustin Ambrossio, Alessio Antonini, Yehia Elrakaiby, Dov Gabbay, and **Marc van Zee**. Argument revival in annotated argumentation networks. *Second workshop on Argumentation in Artificial Intelligence and Philosophy*, 2013.