

MATTHIJS JANSEN

Academic Researcher

Stevensbloem 205 ◊ 2331JC, Leiden ◊ The Netherlands
+31 681156123 ◊ matthijs.s.jansen@gmail.com ◊ msjansen.com



RESEARCH AREAS

My research focuses on infrastructure provisioning, resource management, and application offloading in the digital compute continuum. My active interest concerns declarative deployments and configuration management, which aim to simplify the use and increase the interoperability of systems within the digital compute continuum.

EDUCATION

- E1. PhD in Computer Science**, Vrije Universiteit *(Expected)* 2020 - 2025
Thesis: Exploring the Compute Continuum: Architectures, Configurations, and Education
Supervised by dr. ir. Animesh Trivedi and prof. dr. ir. Alexandru Iosup
- E2. Master of Computer Science**, University of Amsterdam and Vrije Universiteit Amsterdam 2018 - 2020
Thesis: A Performance-Based Recommender System for Distributed DNN Training
Supervised by prof. dr. ir. Ana-Lucia Varbanescu
- E3. Bachelor of Computer Science**, University of Amsterdam 2015 - 2018
Thesis: Thermal Models for the Exploration of Embedded System Architectures
Supervised by prof. dr. Andy Pimentel

PUBLICATIONS

- P1. Memory Efficient WebAssembly Containers**
Matthijs Jansen, Maciej Kozub, Alexandru Iosup, et al.
Third International Workshop on Intelligent and Adaptive Edge-Cloud Operations and Services (Intel4EC) 2025
- P2. Performance Characterization of Data Store Event Trigger Mechanisms for Serverless Computing**
Ritul Satish, Sacheendra Talluri, Sudarshan Sivakumar, Matthijs Jansen, et al.
The 25th IEEE International Symposium on Cluster, Cloud, and Internet Computing (CCGRID) 2025
- P3. Columbo: A Reasoning Framework for Kubernetes' Configuration Space**
Matthijs Jansen, Sacheendra Talluri, Krijn Doekemeijer, et al.
The 16th ACM/SPEC International Conference on Performance Engineering (ICPE) 2025
- P4. The Computing Continuum: From IoT to the Cloud**
Auday Al-Dulaimy, Matthijs Jansen, Bjarne Johansson, et al.
Elsevier Internet of Things 2024
- P5. Reviving Storage Systems Education in the 21st Century — An experience report**
Animesh Trivedi, Matthijs Jansen, Krijn Doekemeijer, et al.
The 24th IEEE International Symposium on Cluster, Cloud and Internet Computing (CCGRID) 2024
- P6. The SPEC-RG Reference Architecture for the Compute Continuum**
Matthijs Jansen, Auday Al-Dulaimy, Alessandro V. Papadopoulos, et al.
The 23rd International Symposium on Cluster, Cloud and Internet Computing (CCGRID) 2023
- P7. Continuum: Automate Infrastructure Deployment and Benchmarking in the Compute Continuum**
Matthijs Jansen, Linus Wagner, Animesh Trivedi, et al.
The First FastContinuum Workshop (FastContinuum) 2023
- P8. Can My WiFi Handle the Metaverse? A Performance Evaluation Of Meta's Flagship Virtual Reality Hardware**
Matthijs Jansen*, Jesse Donkervliet*, Animesh Trivedi, et al.
The Sixth Workshop on Hot Topics in Cloud Computing Performance (HotCloudPerf) 2023
- P9. Beyond von Neumann in the Computing Continuum: Architectures, Applications, and Future Directions**
Dragi Kimovski, Nishant Saurabh, Matthijs Jansen, et al.
IEEE Internet Computing 2023

- P10. GradeML: Towards Holistic Performance Analysis for Machine Learning Workflows**
 Tim Hegeman, **Matthijs Jansen**, Alexandru Iosup, et al.
 The Fifth Workshop on Hot Topics in Cloud Computing Performance (HotCloudPerf) 2021
- P11. DDLBench: Towards a Scalable Benchmarking Infrastructure for Distributed Deep Learning**
Matthijs Jansen, Valeriu Codreanu, Ana Lucia Varbanescu
 The Fourth Workshop on Deep Learning on Supercomputers (DLS@SC) 2020

WORK EXPERIENCE

- W1.** Machine Learning Intern at IBM Research Dublin, Ireland Sep 2024 - Dec 2024
- I constructed a database storing and predicting the performance and memory use of machine learning applications.
 - I designed, implemented, and evaluated a scheduling framework to help assess the impact of exposing knowledge on machine learning application performance to machine learning schedulers.
- W2.** Machine Learning Intern at the Dutch National Supercomputing Center SURF, Amsterdam Feb 2020 - Jun 2020
- I analyzed distributed machine learning algorithms and systems (TensorFlow, PyTorch, Horovod, GPipe, PipeDream).
 - I designed, implemented, and evaluated a recommender system for distributed machine learning, advising machine learning algorithms based on dataset and machine learning model properties.

OPEN SOURCE PROJECTS

- O1. Continuum:** Automate cloud-edge infrastructure deployments and benchmarks with Continuum 2021 - 2025
 Awarded with the IEEE reproducibility badges for Open Research Object and Reusable/Research Object Reviewed.
 The project is available at <https://github.com/atlarge-research/continuum>.
- O2. Columbo:** Explore and optimize Kubernetes configurations for fast application deployment 2023 - 2025
 The project is available at <https://github.com/atlarge-research/continuum/tree/columbo>.
- O3. MetaBench:** Benchmark the performance and energy usage of Meta's flagship virtual reality hardware 2023
 The project is available at <https://github.com/atlarge-research/measuring-the-metaverse>.
- O4. DDLBench:** A recommender system for distributed machine learning algorithms 2020
 The project is available at <https://github.com/sara-nl/DDLBench>.

SERVICE

- S1.** Reviewer for the Elsevier International Journal of Computer and Telecommunications Networking 2025
- S2.** Reviewer for the ACM Transactions on Internet Technology (TOIT) 2025
- S3.** Newsletter editor for the Standard Performance Evaluation Corporation (SPEC) Research Group 2023 - 2025
- S4.** Website Administrator for the Dutch Computer Systems Conference (CompSys) 2022 - 2025
- S5.** System Administrator for research infrastructure operated by the Massivizing Computer Systems group at the Vrije Universiteit Amsterdam 2020 - 2025
- S6.** Website Administrator for the Massivizing Computer Systems group at the Vrije Universiteit Amsterdam 2020 - 2025
- S7.** Artifact reviewer for the IEEE/ACM International Symposium on Cluster, Cloud and Internet Computing (CCGRID) 2023 - 2024
- S8.** Reviewer for the Amsterdam Data Science Thesis Awards 2022 - 2023
- S9.** Reviewer for the Springer Journal of Signal Processing Systems 2023
- S10.** Subreviewer for the ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC) 2023
- S11.** Subreviewer for the IEEE Transactions on Parallel and Distributed Computing (TPDS) 2022
- S12.** Subreviewer for the ACM Web Conference 2022
- S13.** Artifact reviewer for the ACM European Systems Conference (EuroSys) 2021

PRESENTATIONS

Columbo: A Reasoning Framework for Kubernetes' Configuration Space

- R1.** Dutch Computer Systems Conference (CompSys) 2024
- R2.** NWO ICT.OPEN 2024

Continuum: Automate Infrastructure Deployment and Benchmarking in the Compute Continuum

- R3.** Dutch National Growth Fund project Future Network Services consortium 2025
- R4.** Distributed and Parallel Systems group, University of Klagenfurt 2024

- R5. The First FastContinuum Workshop (FastContinuum) 2023
- R6. EU Horizon project Graph Massivizer Consortium 2023
- R7. VU Amsterdam India Science Seminar 2023
- R8. Dutch Computer Systems Conference (CompSys) 2023
- R9. NWO ICT.OPEN 2023

The SPEC-RG Reference Architecture for the Compute Continuum

- R10. The 23rd International Symposium on Cluster, Cloud and Internet Computing (CCGRID) 2023
- R11. TNO-ESI Cloud Continuum workshop 2023
- R12. Parallel Computing Systems group, University of Amsterdam 2023
- R13. Dutch National Supercomputing Center SURF 2022
- R14. SPEC Research Group Cloud 2022
- R15. Dutch Computer Systems Conference (CompSys) 2022
- R16. NWO ICT.OPEN 2022

DDL Bench: Towards a Scalable Benchmarking Infrastructure for Distributed Deep Learning

- R17. Dutch Computer Systems Conference (CompSys) 2021
- R18. NWO ICT.OPEN 2021
- R19. The Fourth Workshop on Deep Learning on Supercomputers (DLS@SC) 2020

TEACHING

- T1. Teacher for Computer Organization (BSc) at Vrije Universiteit Amsterdam 2024
- T2. Teacher for Advanced Network Programming (BSc) at Vrije Universiteit Amsterdam 2023 - 2024
- T3. Teacher for Computer Networks (BSc) at Vrije Universiteit Amsterdam 2023 - 2024
- T4. Teaching Assistant for Distributed Systems (MSc) at Vrije Universiteit Amsterdam 2021 - 2024
- T5. Teaching Assistant for Storage Systems (MSc) at Vrije Universiteit Amsterdam 2021 - 2023
- T6. Teaching Assistant for Advanced Topics in Distributed Systems (MSc) at Vrije Universiteit Amsterdam 2020 - 2023
- T7. Teacher for High-performance Computing (graduate) at the Advanced School for Computing and Imaging 2023
- T8. Teacher for Distributed Systems (graduate) at the Advanced School for Computing and Imaging 2022
- T9. Teaching Assistant for Compiler Constructions (BSc) at University of Amsterdam 2019 - 2020
- T10. Teaching Assistant for Image Processing and Computer Vision (BSc) at University of Amsterdam 2019
- T11. Teaching Assistant for Modern Databases (BSc) at University of Amsterdam 2019
- T12. Teaching Assistant for Concurrent and Parallel Programming (BSc) at University of Amsterdam 2019
- T13. Teaching Assistant for Information Retrieval (BSc) at Vrije Universiteit Amsterdam 2018

SUPERVISION

At the Vrije Universiteit Amsterdam:

- U1. **Alfred Daimari**, MSc Individual Systems Practical 2025
Energy Consumption of Heuristic Kubernetes Schedulers
- U2. **Davit Darbinyan**, BSc Thesis 2024
Kubeless: A Novel Architecture for Kubernetes' Control Plane
- U3. **Jacek Kuśnierz**, MSc Thesis 2024
Enhancing Graph Processing Efficiency in Kubernetes: Towards Application-Aware Scheduling
- U4. **David Freina**, MSc Thesis 2024
End-to-End Power Model for the Compute Continuum
- U5. **Debarghya Saha**, MSc Thesis 2024
Controless: A serverless control plane for Kubernetes
- U6. **Maciej Kozub**, MSc Thesis 2024
Memory-Efficient WebAssembly Containers
- U7. **Tim van Kemenade**, MSc Thesis 2024
Real-time Scaphandre Energy Metrics Pipeline Integrated with Escheduler
- U8. **David Freina**, MSc Literature Survey 2024
A Survey of Energy Measurement Methodologies for Computer Systems
- U9. **Debarghya Saha**, MSc Literature Survey 2024
A Survey of Serverless Workflows

U10. Maciej Kozub , MSc Literature Survey	2024
Survey of Function Offloading and Serverless Functions in the Computing Continuum	
U11. Daniel Berzak , BSc Thesis	2023
Embedded Domain Specific Language: A Streamlined Approach for Framework Abstraction	
U12. Antonios Sklavos , MSc Thesis	2023
Exploring the Performance of Kubernetes-Deployed Containers	
U13. Edgardo Reinoso Campos , MSc Thesis	2023
Serverless Computing at the Edge in Precise Agriculture	
U14. Antonios Sklavos , MSc Literature Survey	2023
Exploring the Performance-Isolation Trade-off for Isolation Mechanisms	
U15. Edgardo Reinoso Campos , MSc Literature Survey	2023
Serverless Computing at the Edge in Precise Agriculture	
U16. Tim van Kemenade , MSc Literature Survey	2023
A Survey of Scheduling Algorithms for the Edge	
U17. Felix Goosens , MSc Individual Systems Practical	2022
Edge Continuum Framework on an ARM Raspberry Pi Cluster	

SKILLS

Programming Languages	Fluent in Python and Bash, familiar with Go and C
Platforms	GNU/Linux, Kubernetes, OpenShift, KubeEdge, OpenWhisk, Spark, GraphScope
DevOps	QEMU, KVM, Docker, WebAssembly, Ansible, Git, Terraform, AWS, GCP
Machine Learning	TensorFlow, PyTorch, Horovod, Kueue, Hugging Face
Data Analysis	NumPy, SciPy, Pandas, Matplotlib