

# MATTHIJS JANSEN

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## RESEARCH AREAS

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

## EDUCATION

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**Doctoral Candidate**, Vrije Universiteit (Expected) 2020 - 2025  
Supervised by dr. Animesh Trivedi and Prof. dr. ir. Alexandru Iosup

**Master of Computer Science**, University of Amsterdam and Vrije Universiteit Amsterdam 2018 - 2020  
Thesis: A Performance-Based Recommender System for Distributed DNN Training

**Bachelor of Computer Science**, University of Amsterdam 2015 - 2018  
Thesis: Thermal Models for the Exploration of Embedded System Architectures

## KEY PUBLICATIONS

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**Columbo: A Reasoning Framework for Kubernetes' Configuration Space**  
Matthijs Jansen, Sacheendra Talluri, Krijn Doekemeijer, Nick Tehrany, Jesse Donkervliet, Alexandru Iosup, Animesh Trivedi  
The 16th ACM/SPEC International Conference on Performance Engineering (ICPE) 2025

**The Computing Continuum: From IoT to the Cloud**  
Auday Al-Dulaimy, Matthijs Jansen, Bjarne Johansson, Animesh Trivedi, Alexandru Iosup, et al.  
Elsevier Internet of Things 2024

**Reviving Storage Systems Education in the 21st Century — An experience report**  
Animesh Trivedi, Matthijs Jansen, Krijn Doekemeijer, Sacheendra Talluri, Nick Tehrany  
The 24th IEEE International Symposium on Cluster, Cloud and Internet Computing (CCGrid) 2024

**The SPEC-RG Reference Architecture for the Compute Continuum**  
Matthijs Jansen, Auday Al-Dulaimy, Alessandro V. Papadopoulos, Animesh Trivedi, Alexandru Iosup  
The 23rd International Symposium on Cluster, Cloud and Internet Computing (CCGRID) 2023

**Continuum: Automate Infrastructure Deployment and Benchmarking in the Compute Continuum**  
Matthijs Jansen, Linus Wagner, Animesh Trivedi, Alexandru Iosup  
The First FastContinuum Workshop (FastContinuum) 2023

**Can My WiFi Handle the Metaverse? A Performance Evaluation Of Meta's Flagship Virtual Reality Hardware**  
Matthijs Jansen\*, Jesse Donkervliet\*, Animesh Trivedi, Alexandru Iosup  
The Sixth Workshop on Hot Topics in Cloud Computing Performance (HotCloudPerf) 2023

**DDL Bench: 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

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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 fine-tuning apps.
- I designed, implemented, and evaluated a scheduling framework to help assess the impact of exposing knowledge on fine-tuning performance to machine learning schedules on application performance.

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

<b>Continuum:</b> Automate cloud-edge infrastructure deployments and benchmarks with Continuum	2021 - 2025
<b>Columbo:</b> Explore and optimize Kubernetes configurations for fast application deployment	2025
<b>MetaBench:</b> Benchmark the performance and energy usage of Meta's flagship virtual reality hardware	2023
<b>DDLBench:</b> A recommender system for distributed machine learning algorithms	2020

## SERVICE

Newsletter editor for the Standard Performance Evaluation Corporation (SPEC) Research Group	2023 - 2025
Reviewer for the International Symposium on Cluster, Cloud and Internet Computing (CCGRID)	2023 - 2024
Reviewer for the Amsterdam Data Science Thesis Awards	2022 - 2023
Reviewer for the Journal of Signal Processing Systems	2023
Reviewer for the International Symposium on High-Performance Parallel and Distributed Computing (HPDC)	2023
Reviewer for the Transactions on Parallel and Distributed Computing (TPDS)	2022
Reviewer for the Web Conference (TheWebConf)	2022
Artifact Evaluation for the European Systems Conference (EuroSys)	2021

## PRESENTATIONS

<b>Columbo: A Reasoning Framework for Kubernetes' Configuration Space</b>	
Dutch Computer Systems Conference (CompSys)	2024
NWO ICT.OPEN	2024
<b>Continuum: Automate Infrastructure Deployment and Benchmarking in the Compute Continuum</b>	
The First FastContinuum Workshop (FastContinuum)	2023
VU Amsterdam India Science Seminar	2023
Dutch Computer Systems Conference (CompSys)	2023
NWO ICT.OPEN	2023
<b>The SPEC-RG Reference Architecture for the Compute Continuum</b>	
The 23rd International Symposium on Cluster, Cloud and Internet Computing (CCGRID)	2023
ESI Cloud Continuum workshop	2023
Parallel Computing Systems group, University of Amsterdam	2023
Dutch Computer Systems Conference (CompSys)	2022
NWO ICT.OPEN	2022
<b>DDLBench: Towards a Scalable Benchmarking Infrastructure for Distributed Deep Learning</b>	
Dutch Computer Systems Conference (CompSys)	2021
NWO ICT.OPEN	2021
The Fourth Workshop on Deep Learning on Supercomputers (DLS@SC)	2020

## TEACHING

Teacher for Advanced Network Programming (BSc) at Vrije Universiteit Amsterdam	2023 - 2024
Teacher for Computer Networks (BSc) at Vrije Universiteit Amsterdam	2023
Teaching Assistant for Distributed Systems (MSc) at Vrije Universiteit Amsterdam	2021 - 2024
Teaching Assistant for Storage Systems (MSc) at Vrije Universiteit Amsterdam	2021 - 2023
Teaching Assistant for Advanced Topics in Distributed Systems (MSc) at Vrije Universiteit Amsterdam	2020 - 2023
Teaching Assistant for Compiler Constructions (BSc) at University of Amsterdam	2019 - 2020
Teaching Assistant for Image Processing and Computer Vision (BSc) at University of Amsterdam	2019
Teaching Assistant for Modern Databases (BSc) at University of Amsterdam	2019
Teaching Assistant for Concurrent and Parallel Programming (BSc) at University of Amsterdam	2019
Teaching Assistant for Information Retrieval (BSc) at Vrije Universiteit Amsterdam	2018

## SUPERVISION

MSc Literature Survey and Thesis of Debarghya Saha at Vrije Universiteit Amsterdam	2024
MSc Literature Survey and Thesis of David Freina at Vrije Universiteit Amsterdam	2024
MSc Literature Survey and Thesis of Maciej Kozub at Vrije Universiteit Amsterdam	2024
MSc Thesis of Jacek Kuśnierz at Vrije Universiteit Amsterdam	2024
BSc Thesis of Davit Darbinyan at Vrije Universiteit Amsterdam	2024
MSc Literature Survey and Thesis of Tim van Kemenade at Vrije Universiteit Amsterdam	2023 - 2024
MSc Literature Survey and Thesis of Edgardo Reinoso Campos at Vrije Universiteit Amsterdam	2023
MSc Literature Survey and Thesis of Antonios Sklavos at Vrije Universiteit Amsterdam	2023

## SKILLS

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<b>Programming Languages</b>	Fluent in Python and Bash, familiar with Go and C
<b>Platforms</b>	GNU/Linux, Kubernetes, KubeEdge, OpenWhisk, Spark
<b>DevOps</b>	QEMU, KVM, Docker, Ansible, Git, Terraform
<b>Machine Learning</b>	TensorFlow, PyTorch, Horovod, GPipe, PipeDream
<b>Data Analysis</b>	NumPy, SciPy, Pandas, Matplotlib