

Chandramouli Gnanasambandham, Dr.-Ing.

Böblingen, Germany • + 49 179 6588043 • chandramouli681990@gmail.com • [Linkedin](#) • [GitHub](#) • [Matlab](#)

Senior Controls Engineer

Advancing Autonomous Mobility with Expertise in Vehicle Dynamics and Scalable Software Architectures.

Experienced Robotics and Software Engineer with 12+ years of experience in simulation tool development, real-time control and C++ programming. Specialized in physics based simulation, control of dynamical systems, and scalable software architectures. Strong background in safety critical systems (ISO-26262) and software validation with a proven track record of leading international teams and collaborating with OEMs.

- ✓ **Led development of physics based vehicle models** (300+ users) using test-driven development and C++.
- ✓ **Integrated vehicle models into ROS2 simulator** for virtual validation, ensuring ISO-26262 compliance.
- ✓ **Proficient in Git workflows and DevOps tools** for scalable and maintainable software solutions.
- ✓ **Implemented co-simulation interface to connect truck models** with virtual drivers for real-time testing.
- ✓ **Mathematical modeling** of mechanical components (tires, steering) and control units (steering, transmission).

TECHNOLOGIES & TOOLS

Languages: C/C++, Python, BASH, MATLAB, Julia
Operating systems: Linux (Debian/Ubuntu), Windows
Simulation: Simulink, IPG CarMaker, COMSOL
Linear algebra libraries: PETSc, EIGEN
DevOps Tools: Git, Docker, Jenkins, GitHub actions

Testing frameworks: pytest, Google test
Debuggers/Profilers: gdb, calgrind, Intel VTune
Networking: ROS1, ROS2, TCP/IP
Standards: ISO-26262

PROFESSIONAL EXPERIENCE

Torc Europe GmbH, Stuttgart, Germany

04/2023 - present

Staff Software Engineer

Led development of highly-scalable simulation tools in C++ using TDD and CI/CD methodologies.

Reported to: Director, Simulation **Direct reports:** 3 Senior and 1 Staff Engineers **Budget Oversight:** \$300,000

- Integrated real-time capable vehicle models in a ROS2 simulator for validation of autonomous driving stack.
- Championed software best practices, including code formatting, linting, and peer reviews.
- Collaborated with external stakeholders to develop a scalable model validation strategy as per ISO-26262.
- Scripting for auto-generating documentation, incl. control system block-diagrams from code based on Git-events.

Daimler Truck AG, Stuttgart, Germany

08/2021 - 03/2023

Vehicle Model Engineer

Developed multi-fidelity vehicle models using MATLAB/Simulink.

Reported to: Product Owner **Direct reports:** 1 Senior Engineer and 1 Co-op. **Budget Oversight:** \$100,000

- Developed multi-fidelity vehicle models in MATLAB/Simulink, to enable tuning of motion control parameters.
- Designed and implemented a TCP/IP-based co-simulation interface in C++ to integrate high-fidelity truck models with virtual drivers, showcasing expertise in system integration and networking

University of Stuttgart, Germany

05/2016 - 04/2021

Academic Researcher

Academic Researcher in Particle Dynamics, Software Development, and Experimental Mechanics.

- Development and administration of the particle simulation software Pasimodo in C++.
- Planning and execution of measurement campaigns of vibrational structures using Laser-Doppler Vibrometry.
- Organisation und assistance for the lecture vehicle dynamics and supervision of lab workshops

Fraunhofer Institute (ITWM), Kaiserslautern, Germany

10/2015 - 04/2016

Intern

Implemented innovative simulation tools to automate vehicle drive data analysis.

EDUCATION

Ph.D. in Mechanical Engineering, University of Stuttgart, 2021

Grade: Magna Cum Laude | **Thesis:** Particle Dampers- Enhancing Energy Dissipation using Fluid/Solid Interactions and Rigid Obstacle-Grids.

M.Sc. in Commercial Vehicle Technology, Technical University of Kaiserslautern, 2016

Grade: 1.9 | **Focus:** Control Theory, Dynamical Systems, Automotive Software Engineering and Embedded Systems.

B.Eng. in Production Engineering, Anna University, Chennai, India, 2012

Grade: 8.3/10

AWARDS & HONOURS

Best Presentation Award 2015

An adaptive approach to real-time estimation of vehicle dynamics parameters using kalman filtering.

Best Presentation Award 2014

Optimization of vehicle parameters based on lap-time simulations using multi-objective evolution algorithm.

CERTIFICATION & PROFESSIONAL DEVELOPMENT

Demonstrated Cross-Cultural Team Leadership | Implemented ISO-26262 functional safety requirements.

LANGUAGES

English (Proficient) | German (Proficient) | Tamil (Native) | Hindi (Advanced)

ADDITIONAL PROJECTS

Raspberry Pi Powered Smart-Home Network

2020 - present

- ✓ Built a versatile Raspberry-Pi smart home network with remote-access, custom file storage server with automatic backups using `rsync`, Zigbee2Mqtt server for controlling IOT devices using siri/google-nest and custom automations.

Machine Learning Suite

2015

- ✓ Implement a deep convolution neural network for optical character recognition as part of a freelance software project in MATLAB. Used MEX API to increase performance.

Driver-in-the-Loop Simulator

2014

- ✓ Implemented a driver-in-the-loop simulator by coupling IPG CarMaker and MATLAB/Simulink.

SELECTED PUBLICATIONS*

Gnanasambandham, C.; Fleissner, F.; Eberhard, P.: Enhancing the dissipative properties of PDs using rigid obstacle-grids. Journal of Sound and Vibration, 2020.

Gnanasambandham, C.; Stender, M.; Hoffmann, N.; Eberhard, P.: Multi-scale dynamics of PDs using wavelets: Extracting particle activity metrics from ring down experiments. Journal of Sound Vibration, 2019.

*for a complete list of publications, visit my [Google Scholar Profile](#)