

PERSONAL INFORMATION



Dennis Benders

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Gender Male | Date of birth 01/11/1997 | Nationality(-ies) Dutch

WORK EXPERIENCE

2021 – Present

PhD Cognitive Robotics

Delft University of Technology, Delft

Research topic: safe embedded Model Predictive Control (MPC) algorithms for mobile robots

Ancillary activities:

- Responsible for developing the quadrotor platforms in the research group, including the hardware and especially the integration of the entire software stack; see also [this](#) GitHub repository and [this](#) GitHub organisation
- Closely involved in designing and building the mobile robotics lab in the Cognitive Robotics (CoR) department (motion capture cameras, video cameras, network setup, workplaces, safety considerations, etc.): see also [this](#) link and [this](#) link
- First department PhD representative
- Supervisor of 3 bachelor student teams and 3 master students
- Mentor of a group of master robotics students

Topics of interest: robotics, MPC, software engineering, sustainability

2017 – 2018

Student coordinator Study Choice Check Electrical Engineering

Delft University of Technology, Delft

The Study Choice Check (SCC) is meant to provide high school students more in-depth information about the study. The student coordinator of the SCC is responsible for the communication from university to student, guiding the students at the SCC days, and designing the SCC online course.

2016 – 2017

Student mentor

Delft University of Technology, Delft

A student mentor is assigned to a group of students to provide a confidential atmosphere and help them in the early phase of the study: guiding students during their first days at the university, organising weekly meetings to discuss recent topics and students' study progress, and being a continuously approachable person in case students encounter difficulties.

EDUCATION

2018 – 2020

Master Embedded Systems

Delft University of Technology, Delft

Specialisation: Systems and Control

Graduation project: "AR.Drone 2.0 state estimation using Dynamic Expectation Maximization (DEM)"; see [this](#) link

2015 – 2018 **Bachelor Electrical Engineering**

Delft University of Technology, Delft

Minor: Responsible innovation

Bachelor endproject: "Motion Reference Unit Testing Platform: Software"; see [this link](#)

2009 – 2015 **High School VWO graduate**

Krimpenerwaard College, Krimpen aan den IJssel

Profile: Nature and technology, including mathematics D, computer science, nature, life and technology (NLT), and management and organisation (M&O)

Profile project: "Solar scooter": adding a solar-powered electrical driveline to a normal scooter

PERSONAL SKILLS

Mother tongue(s)

Dutch

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
German	B2	C1	B2	B2	B2

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2: Proficient user
Common European Framework of Reference (CEF) level

Communication skills

Teamwork: in teams (both technical project teams and sports teams) I always strive for good communication and interaction within the team and towards the outside world.

Mediation skills: as a confidential person in high school I am trained in leading discussions and working towards solutions in a constructive way.

Organisational / managerial skills

When it comes to project work I often take the lead quickly, both during my studies and the PhD. I automatically think about organising meetings, the software architecture, making a project planning and working towards a safe environment where every team member feels at home and appreciated.

Computer skills

The following skills are rated on a scale from 1 (basic) to 3 (good):

- programming languages: C/C++ (3), Python (3), ROS (3), Matlab (3)
- tools: Microsoft Office (3), \LaTeX (3), Git (3), GanttProject (1)
- operating systems: Windows (3), Linux (3)

Driving licence

B, AM (2015)

ADDITIONAL INFORMATION

Hobbies

- sports: playing korfbal, running and ice skating
- music: percussion

PUBLICATIONS

Pub1

Dennis Benders, Johannes Köhler, Thijs Niesten, Robert Babuška, Javier Alonso-Mora, and Laura Ferranti. Embedded hierarchical mpc for autonomous navigation. *arXiv preprint arXiv:2406.11506*, 2024

Pub2

Anastasios Tsolakis, Dennis Benders, Oscar De Groot, Rudy R. Negenborn, Vasso Reppa, and Laura Ferranti. Colregs-aware trajectory optimization for autonomous surface vessels. *IFAC-PapersOnLine*, 55(31):269–274, 2022

Pub3

Fred Bas, Ajith Anil Meera, Dennis Benders, and Martijn Wisse. Free energy principle for state and input estimation of a quadcopter flying in wind. In *2022 International Conference on Robotics and Automation (ICRA)*, pages 5389–5395. IEEE, 2022