Niek **Beckers**

Human-Robot Systems Engineer

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Professional summary

Human-robot systems engineer and researcher. Strong multi-disciplinary background in making sense of complex systems involving humans and robots through modeling, simulation, implementation, and testing. Experienced in understanding human behavior and human factors, human-robot interaction, and robotics. Skilled in robot hardware and software development. Eager to expand my technical and leadership toolkit. I am looking forward to leveraging my skill and drive to developing leading edge technology for human-robot teams and robotics for real-world application areas.

Skills

Human-robot interaction	Human factors, human-robot collaboration, human behavior modeling, simulation, tele-operation, haptics, physical human-robot interaction, human-in-the-loop experiments, analysis and statistics
Robotics	Control engineering, real-time control, path planning, decision-making, robot hardware development, experience in machine learning
Programming	Python, C/C++, R, LaTeX, TwinCAT, MATLAB/Simulink, git
Personal leadership	Engineering & scientific project supervision, teamwork, mentoring, evaluation and constructive feedback, written communication

Experience

Delft University of Technology *Delft, The Netherlands*

Postdoctoral researcher *2019 – present*

- Defining, executing, and communicating on multi-disciplinary research projects on human-robot teams (human-robot interaction strategies and algorithms, human factors).
- Leading a team that is developing a software framework (Python) for human-automated vehicle interaction experiments.
- Researcher and organizer in TU Delft's AiTech initiative on meaningful human control over robotics and AI.
- Mentoring and supervising M.Sc. students (5) on topics related to human-robot interaction, robotics, control engineering, and human factors.
- Research line coordinator of a Gravity grant (2021) proposal on human-robot teams for the future of work (>15M€).

University of Twente *Enschede, The Netherlands*

Ph.D. researcher *2014–2019*

- Independently setting up and managing a research project within a NWO-funded multi-university program including collaboration with industry partners.
- Visiting researcher (2 months, 2.5k€ grant) at a expert researcher on physical human-human interaction at Imperial College London, resulting in a journal paper publication.
- Developing a high-performance robot tele-operation setup to conduct my research including design, construction, real-time control programming. We have conducted >400 hours of human-robot interaction experiments without any major hardware failure.

Massachusetts Institute of Technology *Cambridge, United States*

Research assistant and graduate student *2013 – 2014*

- Accepted into MIT's Aeronautics and Astronautics graduate program (acceptance rate ~10%, GPA 5.0/5.0).
- Defining research scope and developing measurement hardware for a NASA-funded project on human physical adaptation to micro-gravity, including designing training paradigms for astronauts.

Simendo *Rotterdam, The Netherlands*

Software engineer *2010 – 2013*

- Responsible for developing and deploying virtual reality training software in collaboration with expert surgeons (laparoscopy).

Massachusetts Institute of Technology *Cambridge, United States*

Research assistant *2010*

- Supported the development and testing of a decision-support algorithm for UAV operators in scheduling time-constrained visual search tasks. Evaluation: outstanding performance.

Education

University of Twente *Enschede, The Netherlands*

Mechanical Engineering, Ph.D. *2014–2019*

- I studied how humans collaborate physically through robots when learning motor skills together in order to develop intuitive and effective human-robot interaction algorithms.

Technical University Delft *Delft, The Netherlands*

Aerospace Engineering, M.Sc. (cum laude - GPA 8.7/10.0) *2008–2012*

- Improving flight simulator motion algorithms by accounting for limitations in human motion perception.
- *Honours track M.Sc. program of excellence*. I worked with the world-class Desdemona flight simulator at the Netherlands organization for applied scientific research (TNO) for realistic flight simulation motion algorithms and pilot training paradigms.

Technical University Delft *Delft, The Netherlands*

Aerospace Engineering, B.Sc. (cum laude - GPA 8.6/10.0) *2004–2007*

Personal leadership

Project management

TU Delft *2019–present*

- Leading a team of three working on a software framework for human-automated vehicle interaction experiments.
- Coordinating weekly meetings with guest speakers and organizing a conference with workshop for AiTech, TU Delft's multi-disciplinary initiative on meaningful human control.
- Coordinating the development and writing of a research line (one of three lines) for a NWO Gravity grant.

Supervision, mentoring & teaching

TU Delft & University of Twente *2016–present*

- Supervision of multiple M.Sc. (11) and B.Sc. students (5), mentor of M.Sc. students of the Robotics master at TU Delft.
- Course coordinator embedded programming for a robotics course (>70 students), 2016
- Instructor on course on modeling of human behavior, 2015-2018
- Teaching assistant for the courses aircraft design & automated flight control system design, 2008-2010

Societies

TU Delft *2007–2008*

- President of the Aerospace Engineering Student Society. Full-time one-year scholarship. A society with over 1500 members.

Grants & Awards

2015 **Short-Term Scientific Mission Grant; European** , €2500, Imperial College London, United Kingdom

2014 **VOLPE Award for best presentation**, Human Factors Engineering Society student conference, Cambridge, United States

2010 **Winner Consultancy Business Course**, The Boston Consulting Group, INSEAD, Paris, France

Languages & hobbies

Languages English (fluent), Dutch (native), German (intermediate working proficiency)

Hobbies Mountaineering, hiking, mountain biking, skiing, tinkering with robots and bicycles