



# Fuda van Diggelen

PhD candidate,  
Artificial Intelligence: Evolutionary Robotics  
<https://fudavd.github.io>

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- Netherlands

## Social Network

- ORCID: 0000-0002-7972-1649
- Google Scholar profile
- LinkedIn profile
- Github

## Languages

- Dutch
- English
- German

## Hard Skills

- Scientific Research
- Python, C++, MATLAB
- Robotics, Modeling & Simulation
- Statistics & Analysis

## Soft Skills

- Creative Thinking
- Communication
- Writing
- Problem Solving

## About Me

Second year PhD candidate in evolutionary robotics with a broad curiosity in topics of (embodied) intelligence, complex systems and control theory. Graduated with two masters: Human Movement Science and Mechanical Engineering. With a focus on neuromechanics and bio-robotics respectively. In general, I like to tackle hard problems by implementing out of the box ideas that combine techniques/mechanisms from different fields and/or nature. Currently, I am mostly interested in using machine learning techniques for data-driven modelling of complex systems in robotic control.

## Working Experience

- 2022 – 2022 **Visiting Researcher** Technology Innovation Institute  
Autonomous drone swarm experiments using CrazieFly platform
- 2020 – Now **PhD Candidate** VU Amsterdam, *Computer Sciences*  
Artificial Intelligence: Evolutionary Robotics
- 2019 – 2020 **Research Internship** VU Amsterdam, *Computer Sciences*  
Conducting evolutionary robotics research for my master thesis.
- 2019 – 2020 **Master Programme Committee** VU Amsterdam, *Behavioural and Movement Sciences*  
Representing students' interest and advising programme board to improve education.
- 2018 – 2018 **Teacher Assistant** VU Amsterdam, *Behavioural and Movement Sciences*  
Teaching during practicals in the course Physics and Measurements.
- 2014 – 2019 **Tutoring** Bijlesnetwerk/Lyceo  
High school students in mathematics, physics, chemistry and biology.

## Education

- 2018 – 2020 **MSc. & ME. Mechanical Engineering, *Biorobotics*** TU Delft  
Focus: Analysis and application of bio-inspired design for robotic systems.  
**Master Thesis (Ø 8.5)** TU Delft  
Title: *Adaptive Control for Evolutionary Robotics*.  
Designing and implementing continuous learning for adaptive feedback control. Analysis on the resulting performance dynamics in robots during a machine learning task.
- 2017 – 2020 **MSc. Human Movement Science: Research** cum laude VU Amsterdam  
Focus: Integrating fundamental scientific research with relevant questions from clinical and sports practice.  
**Master Thesis (Ø 8.5)** VU Amsterdam  
Title: *The Role of Proprioceptive Feedback in Learning Locomotion*.  
Testing the Internal Model Control hypothesis in bio-inspired robots that learn locomotion.
- 2014 – 2017 **BSc. Bewegingswetenschappen** VU Amsterdam  
Focus: Broad understanding of human movement and all the underlying processes.  
**Bachelor Thesis (Ø 8.0)** VU Amsterdam  
Title: *Do humans continuously minimize metabolic energy expenditure per meter during walking?*  
Research on the capabilities of humans to continuously optimize their walking behaviour during locomotion.

## Besides Work

Relaxing	Sports, reading books and meeting with friends.
Sports	Climbing/bouldering, football, and running.
Music	Writing songs, playing the guitar and going to festivals.
Gardening	Growing a vegetable garden.

## Scientific Outreach

- **Rijksmuseum Boerhaave: brAIpower** Science Museum [link].
- **De kennis van nu special: de robot evolutie** Dutch national television [link].

## Other Activities, Projects & Achievements

- **Nominated for best Master thesis award:** at Vrije Universiteit Amsterdam for my work *The Role of Proprioceptive Feedback in Learning*.
- **Research Visit:** Collaboration on machine learning applications in racing drones (at ICRA) and swarm robotics experiments, at Technology Innovation Institute (TII) Abu Dhabi.
- **Volunteering during COVID-19:** Helped build the *Dutch ICU Data Sharing* pipeline, and developed reinforcement- and supervised- learning models to improve hospital policies.
- **Dam tot Damloop:** Completed 16k run in 1:12:27 with an average pace of 4:30.

## References

### **prof. dr. Gusztai Eiben**

VU Amsterdam, Computer Science

a.e.eiben@vu.nl

**Relationship:** Gusztai Eiben is head of the Computational Intelligence group at the Vrije Universiteit Amsterdam, and my main supervisor during my PhD.

### **dr. ir. Eliseo Ferrante**

Technology Innovation Institute & VU Amsterdam, Computer Science

e.ferrante@vu.nl

**Relationship:** Eliseo Ferrante is a senior director at the Technology Innovation Institute (TII), assistant professor at the Vrije Universiteit Amsterdam, and my daily supervisor during my PhD.

## Publications

- 2022 **Comparing robot controller optimization methods on evolvable morphologies**  
*F. van Diggelen, E. Ferrante, A.E. Eiben*  
Evolutionary Computation, UNDER REVIEW
- 2022 **Environment induced emergence of collective behaviour in evolving swarms with limited sensing**  
*F. van Diggelen, T. Karagüzel, J. Lo, E. Ferrante, N. Cambier, A.E. Eiben*  
In Proceedings of the Genetic and Evolutionary Computation Conference. pp. 31-39  
doi: 10.1145/3512290.3528735
- 2021 **The Influence of Robot Traits and Evolutionary Dynamics on the Reality Gap**  
*F. van Diggelen, E. Ferrante, N. Harrak, J. Lo, D. Zeeuwe, A.E. Eiben*  
IEEE Transactions on Cognitive and Developmental Systems  
doi: 10.1109/TCDS.2021.3112236
- 2021 **Large-scale ICU data sharing for global collaboration: the first 1633 critically ill COVID-19 patients in the Dutch Data Warehouse**  
*L.M. Fleuren, M. Tonutti, D.P de Bruin, et al.*  
Intensive care medicine 47(4). pp. 478–481  
doi: 10.1007/s00134-021-06361-x
- 2021 **Comparing lifetime learning methods for morphologically evolving robots**  
*F. van Diggelen, E. Ferrante, A.E. Eiben*  
In Proceedings of the Genetic and Evolutionary Computation Conference Companion pp. 93-94  
doi: 10.1145/3449726.3459530
- 2021 **Risk factors for adverse outcomes during mechanical ventilation of 1152 COVID-19 patients: a multicenter machine learning study with highly granular data from the Dutch Data Warehouse**  
*L.M. Fleuren, M. Tonutti, D.P de Bruin, et al.*  
Intensive care medicine experimental, 9(1). pp. 32  
doi: 10.1186/s40635-021-00397-5
- 2021 **Learning Directed Locomotion in Modular Robots with Evolvable Morphologies**  
*G. Lan, M. De Carlo, F. van Diggelen, J. M. Tomczak, D. M. Roijers, and A.E. Eiben*  
Applied Soft Computing, 111. pp. 107688  
doi: 10.1016/j.asoc.2021.107688
- 2020 **The Effects of Adaptive Control on Learning Directed Locomotion**  
*F. van Diggelen, R. Babuska, and A.E. Eiben*  
IEEE Symposium Series on Computational Intelligence (SSCI). pp. 2117-2124  
doi: 10.1109/SSCI47803.2020.9308557