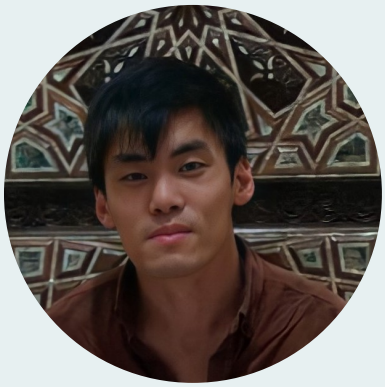

Fuda van Diggelen

PhD candidate,

Artificial Intelligence: Evolutionary Robotics

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Online Presence

Personal website

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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 adaptive systems.

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 (∅ 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 (∅ 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 (∅ 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, *brAInpower*:** PhD work was featured in a special science museum exhibition [link].
- **De kennis van nu special, *de robot evolutie*:** PhD work was featured in a documentary on Dutch national television [link].
- **Joint Lectures on Evolutionary Algorithms (JoLEA):** Presented in a lecture series on evolutionary algorithm [link].

Other Activities, Projects & Achievements

- **Extracurricular Courses**:
  - 2021 Evolutionary Computing, *VU*
  - 2021 Deep Learning, *VU*
  - 2020 Data Mining Techniques, *VU*
  - 2020 Learning Machines, *VU*
  - 2016 Educating for the Good Life, *VU*
- **Nominated for best Master thesis award:** at Vrije Universiteit Amsterdam for my work *The Role of Proprioceptive Feedback in Learning*.
- **3rd Place in MRS competition:** IEEE RAS on Multi Robot Systems (MRS), summer school competition on multi-robot collaboration using drones.
- **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* SQL 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. **Guszti Eiben**
VU Amsterdam, Computer Science a.e.eiben@vu.nl
Relationship: Guszti 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 **Predicting responders to prone positioning in mechanically ventilated patients with COVID-19 using machine learning**
T.A. Dam, L.F. Roggeveen, F. van Diggelen, et al.
Annals Intensive Care 12(1). pp 1-9
doi: 10.1186/s13613-022-01070-0

2022 **Comparing robot controller optimization methods on evolvable morphologies**
F. van Diggelen, E. Ferrante, A.E. Eiben
Evolutionary Computation Journal, [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