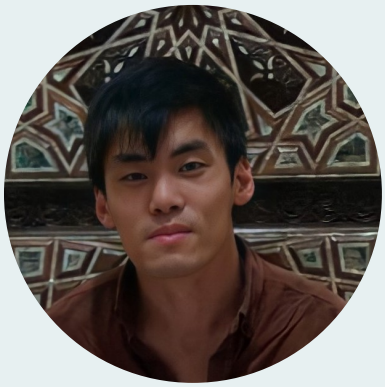

Fuda van Diggelen

PhD candidate,

Artificial Intelligence: Evolutionary Robotics

17-09-1993

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Netherlands

Online Presence

Personal website

Google Scholar profile

LinkedIn profile

Github

YouTube

Languages

Dutch	●●●●●
English	●●●●●
Python	●●●●●
C++	●●●●○
MATLAB	●●●●○

Hard Skills

Mathematics, ML/Control Theory

Robotics, Gazebo, ROS, openCV

Machine Learning, Deep learning, Online-learning, Self-modelling

Data analysis, Statistical modeling

Soft Skills

Creative Thinking

Communication

Writing

Problem Solving

About Me

As a 4th year PhD candidate in evolutionary robotics, I have developed a deep interest in the fields of embodied intelligence, complex systems, and control theory. With dual masters in Human Movement Science and Mechanical Engineering, I can bring a unique perspective by combining techniques from different fields to tackle challenging projects. My research focuses on the integration of machine learning with bio-inspired control for robots in unknown environments. Here I developed model agnostic controllers for complex adaptive systems, using data-driven modeling. My main interest lies in self-adaptive control systems.

Working Experience

2020 – Now **PhD Candidate** VU Amsterdam, *Computer Sciences*
Artificial Intelligence: Evolutionary Robotics

2024 – 2024 **Visiting Researcher** École Polytechnique Fédérale de Lausanne (EPFL)
Research on generative design of tensegrity robots

2022 – 2022 **Visiting Researcher** Technology Innovation Institute (TII)
Autonomous drone swarm experiments using CrazieFly platform

2019 – 2020 **Research Internship** VU Amsterdam, *Computer Sciences*
Conducting evolutionary robotics research for my master thesis.

2018 – 2018 **Teacher Assistant** VU Amsterdam, *Behavioural and Movement Sciences*
Teaching during practicals in the course Physics and Measurements.

Education

2020 – 2024 **PhD. Computer Science, *Artificial Intelligence*** VU Amsterdam
Ph.D. thesis is not published yet.

2018 – 2020 **MSc. & ME. Mechanical Engineering, *Biorobotics*** TU Delft
Focus: Analysis and application of bio-inspired design for robotic systems.

2017 – 2020 **MSc. Human Movement Science: Research** cum laude VU Amsterdam
Focus: Understanding neuromechanical perception-action coupling through sensorimotor feedback control.

2014 – 2017 **BSc. Bewegingswetenschappen** VU Amsterdam
Focus: Bio-physics on human movement and control.

Scientific Outreach

- **Youtube:** A video repository on past projects and published papers [link].
- **Rijksmuseum Boerhaave, *brAInpower*:** Temporary exhibition of our lab work in national science museum [link].
- **De kennis van nu special, *de robot evolutie*:** Dutch national television documentary featuring my PhD work [link].
- **Joint Lectures on Evolutionary Algorithms (JoLEA):** Presented in a lecture series on evolutionary algorithm [link].

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.

Other Activities, Projects & Achievements

- **Extracurricular Courses**:
  - 2024 Causality (*UVA*)
  - 2023 Winterschool on Efficient Deep Learning (*ASCI*); Machine Learning Theory (*UVA*)
  - 2022 IEEE RAS on Multi Robot Systems (*CTU*)
  - 2021 Evolutionary Computing (*VU*); Deep Learning (*VU*)
  - 2020 Data Mining Technique(*VU*); Learning Machines (*VU*)
- **Research Visit, EPFL:** Building autonated design pipeline for tensegrity soft robots, at École Polytechnique Fédérale de Lausanne (EPFL).
- **Research Visit, TII Abu Dhabi:** Developing Computer Vision based Model-Predictive control in racing drones (at ICRA) and lead researcher in swarm robotics experiments, at Technology Innovation Institute (TII) Abu Dhabi.
- **Nominated for best Master thesis award:** at Vrije Universiteit Amsterdam for my work *The Role of Proprioceptive Feedback in Learning*.
- **2nd Place in ICAR drone competition:** Autonomous drone flight competition.
- **3rd Place in MRS competition:** Summer school competition on multi-robot collaboration with drones where I developed a novel planning and control algorithm.
- **Master Programme Committee:** Representing students' interest and advising programme board.
- **Volunteering during COVID-19:** Helped build the *Dutch ICU Data Sharing* pipeline, and developed reinforcement- and supervised- learning models to improve hospital policies.
- **Rotterdam marathon:** Completed the Rotterdam marathon in 3:24:55.

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**
VU Amsterdam, Computer Science e.ferrante@vu.nl
Relationship: Eliseo Ferrante is an assistant professor at the Vrije Universiteit Amsterdam, and my daily supervisor during my PhD.

Publications

2024 **A model-free method to learn multiple skills in modular robots**
***F. van Diggelen**, N.P.A Cambier, E. Ferrante, A.E. Eiben*
Nature Communications 15(1), pp. 6267.
doi: 10.1038/s41467-024-50131-4

2024 **Emergence of specialized collective behaviors in evolving heterogeneous swarms**
***F. van Diggelen**, E. Ferrante, A.E. Eiben*
Parallel Problem Solving from Nature (PPSN XVIII), LNCS 15149, pp. 53-69
doi: 10.1007/978-3-031-70068-2_4

2023 **Comparing robot controller optimization methods on evolvable morphologies**
***F. van Diggelen**, E. Ferrante, A.E. Eiben*
Evolutionary Computation. pp. 1-19
doi: 10.1162/evco_a_00334

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 **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