



Rafael F. Cunha

University Lecturer
Ph.D. Candidate

Brazilian

📍 Netherlands

✉️ rafaelcunha2013@gmail.com

🌐 [rafaelcunha2013](https://www.linkedin.com/in/rafaelcunha2013)

📱 [rafaelcunha2013](https://www.instagram.com/rafaelcunha2013)

☎️ +31 06 3942 5842

Scientific interests

- Machine Learning
- Control Theory
- Game Theory
- Markov Process

Programming Skills

Matlab, Python, Git
Numpy, Pandas
PyTorch, TensorFlow

Languages

English C1
Dutch B1
Portuguese Native

Soft Skills

- Critical thinking
- Problem-solving
- Teamwork
- Willingness to learn

Hobbies

- Playing acoustic guitar
- Biking in the countryside
- Walking in the park with my dog

Experience

Apr. 2023 – current **Lecturer at University of Groningen**

- **Lecturer Artificial Intelligence:** Development of courses for the AI curriculum, along with supervision of master's and bachelor's students enrolled in thesis projects within the AI department.

Sept. 2018 – current **PhD Candidate at University of Groningen**

- **Multi-agent Reinforcement Learning:** Development and convergence analysis of multi-agent **machine learning** algorithms that are able to transfer knowledge between different tasks.
- **Reinforcement Learning and autonomous vehicles:** Application of reinforcement learning algorithms, that is, an **Artificial Intelligence** technique, to reduce the fuel consumption of longitudinal platoon systems.
- **Game Theory and Markov Process:** Study of a general case of imitation dynamics where the structure of the game and the imitation mechanisms change in time according to a continuous-time Markov jump process.

Sept. 2019 – Sept. 2022 **Teaching assistant at University of Groningen**

- Daily supervisor of master and bachelor students enrolled in their thesis projects. Total of five projects, one each academic semester, in the fields of reinforcement learning and stochastic process.
- Tutorial classes for the course “Modelling and Analysis of Complex Networks”.

Feb. 2018 – Aug. 2018 **Teaching assistant at UNICAMP**

- Exercise classes and tutoring for the course “Linear Systems Analysis”.

Aug. 2009 – Feb. 2017 **Petroleum Engineer at PETROBRAS, Brazil**

- **2011 - 2017 Reservoir Engineering:** On-shore oil field management and reservoir simulations.
- **2010 - 2011: Production and Artificial oil lift design:** Developing projects to equipping, monitoring and resolving failures of wells in on-shore oil fields.
- **2009 - 2010 Petrobras Graduate program:** Petroleum Engineer Course with specialization in Production and Reservoirs, with a workload of 1800 hours.

Abr. 2008 – Nov. 2008 **Intern at Atmos Sistemas (ATMOS), Brazil**

- Development of a two-axis controller for a weather radar.

Abr. 2006 – Jul. 2006 **Intern at Kuka Roboter GmbH (KUKA), Germany**

- Identification and analysis of an industrial robot's elastic model.

Education

Sept. 2018 – current. **PhD Candidate**

Faculty of Science and Engineering, DTPA, University of Groningen
Transfer learning in multi-agent reinforcement learning problems.

Mar. 2017 – Aug. 2018 **Masters in Electrical Engineering**

University of Campinas (UNICAMP), Campinas – Brazil
Thesis: Robust partial sampled-data state feedback control of Markov jump linear systems

Feb. 2003 – Dec. 2008. **Bachelor in Electronic Engineering**

Technological Institute of Aeronautics (ITA), São José dos Campos – Brazil
Thesis: Development of a two-axis controller for radars

Courses / Certifications

- Deep Learning Specialization - Coursera - Nov/2022
- Machine Learning Specialization - Coursera - Sep/2022
- Eastern European Machine Learning Summer School - Jul/2022
- Dutch Institute of Systems and Control (DISC) Educational Program - Sep/2020

Publications

- R. F. Cunha, T. R. Gonçalves, V. S. Varma, S. E. Elayoubi and M. Cao, “**Reducing fuel consumption in platooning systems through reinforcement learning,**” in *6th IFAC Conference on Intelligent Control and Automation Sciences, 2022*.
- R. F. Cunha, L. Zino, and M. Cao, “**On imitation dynamics in population games with Markov switching,**” in *2021 European Control Conference*.
- R. F. Cunha, G. W. Gabriel, and J. C. Geromel, “**Robust partial sampled-data state feedback control of Markov jump linear systems,**” in *International Journal of Systems Science*, 50(11), 2142-2152, 2019.
- R. F. Cunha, G. W. Gabriel, and J. C. Geromel, “**Partial Sampled-Data State Feedback Control of Markov Jump Linear Systems,**” in *9th IFAC Symposium on Robust Control Design, 2018*.