

# Arnaud Ruymaekers

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I'm a researcher at the Physics informed Machine Learning for biological Behavior (PiMLb) unit of the Machine Learning Genova Center (MaLGa). My work revolves around the application of Reinforcement Learning techniques to the problem of Olfactory Navigation.

I'm a computer scientist and I like to apply my knowledge to a variety of topics. I have experience in Python, Java, SQL, C++,... I also have experience with Agile development, DevOps and the Microsoft Azure suite.

I speak English (fluent), French (mothertongue), Italian (intermediate), and Dutch (intermediate).

## Experience

Mar 24 – Now

### Research Fellow

#### Machine Learning Genova Center (MaLGa)

Within the Physics informed Machine Learning for biological Behavior (PiMLb) unit, I work on applying Reinforcement Learning (RL) techniques to the problem of Olfactory Navigation by proposing novel solutions. I also build a Python framework where a variety of different techniques can be compared and evaluated.

**Keywords:** Reinforcement Learning, Olfactory Navigation, Python

Sep 20 – May 23

### ICT Consultant

#### Open Line

I helped maintain and build upon the Extract Transform and Load (ETL) processes within the Business Intelligence (BI) team using Microsoft Azure suite tools such as Databricks, or Azure Data Factory. I also built a code framework in order to optimize data transfers within the ETL processes and facilitate daily operations within the team. Finally, I expanded and improved the DevOps pipeline of the BI team to allow for more efficient and reliable release cycles.

**Keywords:** ETL, BI, Microsoft Azure, DevOps, Databricks, Azure Data Factory

Sep 18 – Aug 20

### Intern – Honour's Program (Ke@Work)

#### Open Line and Maastricht University

As an intern at Open Line for the Ke@Work Honour's program, I got to work on an Operations Research optimization project where I implemented a suggestion algorithm to propose improvements to the virtualization of the storage. I also worked on time-series forecasting to predict to workload of the various service desk teams. These projects were integrated within the Extract, Transform and Load (ETL) processes of the Business Intelligence (BI) team.

**Keywords:** Operations Research, Time-Series forecasting, ETL, BI

Sep 18 – Aug 20

### Treasurer- Student Association Board Member

#### MSV Incognito- Maastricht University

As the treasurer of the student organization MSV Incognito, I managed the cash flow in order to allow for the prices for the students during events to remain low while building a strong enough reserve to organize ever more exciting events.

And, as a board member, I also led the Yearbook committee where I managed a group of members with the purpose of taking pictures during events and ultimately create a yearbook of all these memories.

Jan 18 – Aug 20	<p><b>Student Ambassador</b>  <b>Maastricht University</b></p> <p>As the student ambassador, I helped promote the study program during Open Days by talking about my experience within the program and by animating a programming exercise for prospective students. I also allowed students to experience a day studying in the program through the “Student for a Day” event.</p>
Sep 21 – Mar 24	<p><b>Education</b></p> <p><b>Masters of Science (MSc) in Computer Science</b>  <b>Università di Genova</b></p> <p><b>Track:</b> Data Science and Engineering – Artificial Intelligence</p> <p>During this degree I followed courses around the topics of advanced computer sciences and machine learning.</p> <p><b>Thesis Title:</b> "Navigating by Scent: A Model-Based Approach to Olfactory Navigation using Partially Observable Markov Decision Processes" (Supervisors: Prof. A. Seminara; Prof. A. Verri)</p> <p><b>Summary:</b> A solution to the Olfactory Navigation problem using a model-based Reinforcement Learning framework: Partially-Observable Markov Decision Processes (POMDPs). A multi-threaded, GPU-capable implementation of the Point-Based Value Iteration (PBVI) solver was implemented leading us to confirm the apparition of casting and surging behaviors. Some potential shortcomings of the technique where also uncovered.</p> <p><b>Final Grade:</b> 110/110 e lode</p>
Sep 17 – Aug 20	<p><b>Bachelor of Science (BSc) in Data Science and Knowledge Engineering</b>  <b>Maastricht University</b></p> <p>I learned about computer sciences, and mathematics applied to the domain of data science and machine learning.</p> <p><b>Thesis Title:</b> "Pareto Optimal State Search Using Simulated Annealing" (Supervisor: Dr. G. Stamoulis)</p> <p><b>Summary:</b> An Operation Research problem solved by Simulated Annealing and Integer Linear Programming.</p> <p><b>Final Grade:</b> 8.43/10</p>
Sep 16 – Jun 17	<p><b>Exchange Year in the USA</b>  <b>Shakopee High School</b></p> <p>An experience in the USA where I got to become fluent in English and got experience in Web Design, Computer Programming and Robotics.</p>
Sep 12 – Jun 16	<p><b>High School</b>  <b>Athenée Royal de Wareme</b></p> <p><b>Option:</b> Science (math 8h)</p> <p>I built a strong basis for future studies in sciences and mathematics. I also followed an intensive Dutch-language curriculum.</p>