



Mehdi Zouitine



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## EDUCATION

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### MSc 2. Statistics – Toulouse School of Economics

2020–2021



- Statistics
- Optimisation
- Machine learning and deep learning
- Graph theory
- Software engineering

### MSc 1. Applied Mathematics – Université Paul Sabatier

2019–2020



- Image and signal processing
- Optimisation
- Programming
- Probability
- Statistics
- Scientific calculation

### BCs. Pure Mathematics – Université Paul Sabatier

2016–2019



- Topology
- Group Theory
- Calculus
- Linear algebra
- Probability
- Real and complex Analysis
- Differential equation

### BCs. Computer science – Université Paul Sabatier

2016–2019



- Programming
- Data structure
- Parallel computing
- System
- Database
- OOP/FOP
- Graph theory

## WORK EXPERIENCE (4 PREVIOUS POSITIONS)

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### IRT Saint Exupéry – Toulouse

09/2020–10/2021



- Research in Multi-agent Deep reinforcement learning
- Defense project with the **DGA**
- Bibliography and state of the art
- Implementation of reinforcement learning algorithm : PPO, A2C
- High Performance computing
- Implementation of gym multi-agent environments



- Deep learning on flight test data
- Sensor value prediction using MLP and LSTM
- Study the efficiency of Siamese networks for the detection of anomalies in time series
- Communication and presentation of results to industry experts



- Formal verification of deep neural network
- Study of a method based on lipshitz networks to ensure their robustness.
- Software development and testing in Python



- Problems of mathematic tessellation
- Initiation to research
- Reading scientific paper
- Software development and testing in Python

## SIDEWORK

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### Open source software



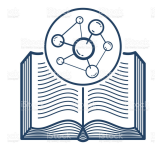
I develop various projects related to machine learning. In particular, I actively maintain [gym-ma-toy](#), which is a Python library for RL-environment. I have also developed several deep learning architecture in Pytorch (LSTM, GAN, transformers)

### Competitions



I participate in a lot of data science competitions. In particular the international olympiad which gathers students and PhD students from all over the world. I enjoy competitive data science and I find it to be a great way to sharpen my skills

### Reading club



I am part of a community with which we share our knowledge around reading club. Topics range from pure math, optimization, deep learning and reinforcement learning

## SKILLS

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<b>Programming</b>	Very experienced in Python
<b>Mathematics</b>	Knowledge and solid experience in many areas of mathematics
<b>Data analysis</b>	Numerous case studies done during university projects, internships, and competitions
<b>Image, signal</b>	Solid theoretical knowledge in image and signal processing
<b>ML, DL and RL</b>	Solid knowledge of the concepts and hands-on experience (Pytorch)
<b>Code quality</b>	Healthy habits regarding coding conventions, documentation, and testing
<b>Writing/reading</b>	Keen interest in making documentation and writing blog posts. Reader scientific paper
<b>Languages</b>	Fluent French. Professional english

## DISTINCTIONS

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**Finalist of the International Data Analysis Olympiads (IDAO)**

**2020**

**1st place in the Continental hackathon 2019**

**2019**

## REFERENCE

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**Fabrice Gamboa** : Professor in Mathematics at the University of Toulouse Paul Sabatier and ANITI researcher at IMT (Toulouse institute of Mathematics) laboratory (fabrice.gamboa@math.univ-toulouse.fr).

**Martin Strecker** : Professor in computer science at the University of Toulouse Paul Sabatier and researcher at IRIT (Toulouse institute of computer science) laboratory (martin.strecker@irit.fr).

## HOBBIES

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— Teaching

— Cooking

— Programming

— Boxing

— Reading

— Maths