# Johan Gras

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## EDUCATION

### CERGY-PONTOISE UNIVERSITY
MSc in Artificial Intelligence
Oct 2019 | Cergy, France
Major GPA: 4.0/4.0

### PARIS-SACLAY UNIVERSITY
BS in Computer Science
June 2017 | Orsay, France

## COURSEWORK

### ARTIFICIAL INTELLIGENCE
Machine Learning
Neural Networks
Graph and Tree Search
Computer Vision
Reinforcement Learning + Practicum
Genetic Algorithms
Optimization Methods
Probability and Statistics
Signal Processing

### COMPUTER SCIENCE
Advanced Algorithmic
Advanced Databases
Oriented-Object Programming
Embedded Computing
Systems and Networking
Web Development
Compilation and Formal Language

## SKILLS

### TECHNOLOGIES
**Programming:**
Python • C • C++ • Java • LaTeX
OCaml • Assembly • Unit testing
**Machine Learning:**
Numpy • Tensorflow • Pytorch
Scikit-learn • Matpotlib
**Web:**
PHP • Laravel • HTML • CSS • JS
**Database:**
SQL • Neo4J

### DEVOPS
Git • Jenkins • Unix • Bash
Docker • AWS • GCloud

## EXPERIENCE

### THALES | Research Scientist Intern (ML)
Apr 2019 - Sep 2019 | Montreal, QC, Canada
Optimization of resources allocation on flying assets through Deep RL.
- **Shaped** policies capable of adaptation to a variety of simulated scenarios.
- **Built** a RL framework that seamlessly integrates into a complex simulator.
- **Gathered** the efforts of scientific and engineering teams by bridging their vision and knowledge gap together in order to efficiently build our system.

**Leveraged knowledge in:** Python, Tensorflow, Git, automated testing (Pytest), continuous integration (Jenkins), AGILE methods, DQN and Policy Gradient.

### THALES | Software Engineering Intern
Jul 2018 - Sep 2018 | Elancourt, France
Creation of a desktop application to design and manage a traffic simulation.
- **Redesigned** the way to create a scenario by building a clean user interface.
- **Reduced** by an order of magnitude the average time to create a simulation through the automatisation of: map importation, traffic and events generation,...
- **Decoupled** the backend from the frontend by building two distinct applications communicating through a REST API.

**Leveraged knowledge in:** Python, Java, Flask, Swing, Git, traffic simulation (SUMO).

## PROJECTS

### MY PORTFOLIO | johan-gras.github.io

### PUZZLE REASSEMBLY | Master Research Project
- **Tackled** the jigsaw puzzle reassembly problem in a context where boundary information is missing.
- **Used** Deep RL with Monte Carlo Tree Search to arrange the puzzle pieces with a perfect reconstruction rate of 63% (9 eroded pieces on the MNIST dataset).
- **Presented** methodology and results in a research paper and a webpage.

**Used:** Python, Tensorflow, Model-Based Reinforcement Learning (Alpha-Zero like).

### BIG COOKING DATA | Data Science Project
- **Scraped** over 100 000 cooking recipes from the web.
- **Pre-processed** highly inconsistent data using NLP techniques.
- **Created** new data by identifying recipe clusters using kmeans, PCA and NLP.
- **Developed** a recommender system for recipes based on user preferences and ingredient proximity.
- **Built** a computer vision app that automatically register shopped food items.

**Used:** Python, Java, Fast.AI, Scrapy, Scikit-learn, Neo4J, JSF, Tomcat, NLTK.

### AI ALGORITHMS | Implementation of Papers
- **Implemented** MuZero, Expectation-Maximisation, Alpha-Beta and other AI algorithms after a deep analysis of literature.
- **Created** a reinforcement learning library (AlphaRL) with implementations of the most popular RL algorithms.

**Used:** C, Python, Tensorflow, Numpy.

### INDOOR TRACKING | Computer Vision Project
- **Built** a computer vision project in C, featuring a multi-criteria tracking system.
- **Implemented** a couple of low level algorithms relying on few external libraries.

**Used:** C, Mathematical morphology, Image segmentation, Interest point Detection.