# Arthur ZUCKER

## MSc Machine Learning Student at ENS Paris-Saclay | Looking for a 4 to 6 months internship


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22 years old


In order to graduate from my MSc, I need to complete a **Research oriented** internship. I have a lot of experience in applied mathematics and programming, yet I specialize in deep learning. I wish to work on Deep Learning projects, and would love to participate in highly technical research. I am open to pursue the internship during a PhD.

## Skills

| | |
|---|---|
| **AI, Deep Learning** | **Python** :Pytorch, Tensorflow, Keras, Open Cv, Librosa |
| **Programming languages** | **Python**,**C**,**C++**, **R**, **MatLab**,**Fortran**, Shell,HTML, CSS, Java, MIPS, Go |
| **Programming tools** | Gitlab & Github, Team Viewer, Google Colabs, Flutter (Dart) |
| **Modelling** | **GAML** (Multi agent programming language) |
| **Editing languages** | MarkDown, LaTeX, Jupyter Notebook |
| **Mathematics for deep learning** | Optimisation and Computation, Statistics and Probability, Complexity and Calculus |
| **Other** | High Performance Computing (GPU programming, OpenMP, MPI, CUDA), Advanced Cryptography (openssl), Game programming (GODOT), **Quantum Computing** |

## Professional Experiences

**Feb. 22nd 2021 – Aug. 20th 2021**

**Computer Vision intern | DeepLearning, Image Processing team,** — **SAFRAN Massy, France**

- Explored and synthesized the state of the art (SOTA) in the field of RGBD semantic segmentation
- Implemented spatially deformable convolution on top of SOTA Hierarchical Multi-Scale Attention architecture blocks to increase semantic segmentation results.
- Rigorously compared the effect of the added new blocks in terms various metrics in an ablation study.
- Ported deformable convolutions from pytorch 0.4 to pytorch 1.4+

Python | Pytorch | Computer Vision | Research | Semantic Segmentation | RGB-D

**Results**: Successfully implemented different architectures, reaching performances comparable to SOTA

**July 28th 2020 – now**

**Research Assistant | Deep Learning, Biosphere laboratory,** — **Kyoto University, Japan**

- Developed a 3 steps PAM (Passive Acoustic Monitoring) pipeline for Flying Foxes (Mega-Bats)
- Implemented an automatic audio event detector using SOTA DNN, various architectures and novel ideas.
- Worked on one-shot learning speaker recognition-related tasks using siamese networks.

Python | Pytorch | Audio Processing | Speaker recognition

**Engagement**: The research is still going on as a side project. Recently presented a poster to the $15^{th}$ European Bat Research Symposium (EBRS) conference. Find more about that on my website

**June 9th 2019 – Aug. 9th 2019**

**Intern | AI software developer, AI team,** — **Chainos Solution, Hanoï, Vietnam**

- Worked on computer vision projects : image to excel, CAD reader, face recognition
- Received Deep Learning courses and python oriented for AI trainings
- First approach to Face Recognition using haar-like features
- Helped to develop an invoice reader API

Python | Tensorflow | Computer vision | Research | publication

**Results**: Wrote a research article with a teammate on Automatic Table structure recognition

**July 1st 2018 – Aug. 30th 2018**

**Trainee | Computer Scientist, Bio-informatic laboratory,** — **Kyoto University, Japan**

- Developed a solution in R for automatic audio segmentation of bat calls in natural recordings
- Field work : captured and studied bats under the tutoring of Dr. Vincenot
- Research driven by the need to protect the species from culling
- Modeled bat trajectories

R | RStudio | MatLab | Bats | Signal processing | Research

**Engagement**: Became a member of the IBRG (`https://www.batresearch.net/`)

## Education

2021-2022 **MSc Machine Learning** at **ENS Paris-Saclay**, in the "Mathematics, Vision and Learning" (MVA), Paris, France. Enrolled in : *Reinforcement Learning*, *Computer Vision and object recognition*, *Convex Optimisation*, *Advanced Learning for Text and Graphs*, *Deep Learning*

2016-2021 **Engineering degree** at **Polytech Sorbonne, Sorbonne University**, in the "Mathematics Applied to Computer Science". **Major of promotion from 2019 to 2021**

## Projects

**Deep Learning : Static and Dynamic Hand Gestures Recognition** 2020 - 2021

Gesture classification using 29 different features. Implemented and evaluated classical ML algorithms as well as siamese Neural Networks. Non-guided, autonomous Neural Network architecture research.

Pytorch | Siamese Network | Research

**CUDA High Performance computing project** 2020 - 2021

Parallelisation of the *Batch merge* and the *batch sort* algorithm using different type of computer memory.

CUDA | C++ | Optimisation

**Finite element modelling** 2020 - 2021

Implemented Galerkin's Finite element Method (GFEM)

Python | Modelling | Github

**Twizzy contest** 2020 - 2021

Earned the second place in the national twizzy contest : an innovation contest organised by Renault and Segula technologies with more than 80 french engineering schools competing.

Innovation | FLutter | Project management | SCRUM

## References

@ **Dr. Myriam Compte**
*Former director of Polytech Sorbonne's engineeering school*
Sorbonne University, France

@ **Dr. Vincenot**
*Assistant professor,researcher*
Kyoto university, Kyoto Japan

@ **Dr. Patrick Gallinari**
*Deep Learning researcher*
LIP6 laboratory, Sorbonne University, France

@ **Dr. Bouillaguet Charles**
*Cryptography researcher*
LIP6 laboratory, Sorbonne University, France

@ **Dr. Hacène Ouzia**
*Optimisation researcher*
LIP6 laboratory, Sorbonne University, France

@ **Dr. Xavier Tannier**
*Responsible of the Applied Mathematics and Computer Science promotion, NLP researcher*
Sorbonne University

## Courses Followed

**Mathematics** : Topology, Linear algebra, Numerical Analysis, Convolutions & Fourier, Polynomial system resolution, Analysis
Differential Calculus, EDP analysis, Finite Element methods

**Statistics** : Statistics and probabilities, Data analysis, Inferential statistics, statistical learning

**Computer Science** : General Algorithms, Distributed Computing, Decidability and complexity, Floating point computation, Signal Processing, HPC, Security and Cryptography, Databases

**AI** : Reinforcement Learning, Computer Vision and Object recognition, Deep Learning, Advanced Learning for Text and Graph, Convex optimization and applications in machine learning,Introduction to Medical Image Analysis

**Management** : Agile development, SCRUM

## Languages

French (native) ●●●●●
English (C2) ●●●●○
Japanese (A2) ●●○○○
Spanish (A2) ●●○○○
Korean (A2) ●●○○○

## Profile

- Curious and passionate about deep learning.
- Open minded, thrive to explore new ideas and new cultures.
- Optimistic and great at working in teams, used to be team leader.
- Disciplined and hardworking.