

# QUANTITATIVE BIOLOGY ENGINEER



**Alexandre Jeanne**

Born January 5th, 1995  
Nationality: French



[alexandrej16@gmail.com](mailto:alexandrej16@gmail.com)



Lausanne, Switzerland



+41782144341

## About me:

I have always been interested in science, and I quickly decided to specialize in biotechnologies. After approximately 7 years of studying and working in the laboratory, specializing in molecular biology, I decided to move forward into bioinformatics and data analysis. I find it fascinating to merge lab work with emergent technologies. That is how I would like to steer my career. Apart from my work, I engage in sports, mostly running, and participate in half-marathons and other running competitions. I also enjoy reading and hiking during my free time.

## MASTER THESIS AND WORKING EXPERIENCES:

*Since February 2<sup>nd</sup>, 2021:*

**Quantitative Biology Engineer**

**NANOLIVE**, Tolochenaz, Switzerland.

For over 3 years, my work at Nanolive involved developing machine-learning/deep-learning-based assays for the [segmentation of subcellular objects](#), such as mitochondria, the nucleus and nucleoli, in holotomography.

This work encompassed:

- Developing my own application using WxPython and PyQt5 for creating labels.
- Elaborating on relevant training and testing sets, optimizing our training strategies, and evaluating the performances of our models.
- I also participated in data segmentation and data analysis for article writing, including a collaboration with Pasteur Institute on its way to be published.

Programming in Python, Machine-learning, Deep-learning, Data analysis, CellProfiler, Subcellular object segmentation, Git, GitHub, PyQt5, WxPython, Anaconda, Software prototype development

*From March 2<sup>nd</sup> to August 28<sup>th</sup>, 2020:*

**Master Thesis: Deep-Learning for cellular segmentation in Holo-tomographic volumes**

**NANOLIVE**, Tolochenaz, Switzerland. Under the direction of Dr. M.Fréchin.

During my master's thesis at Nanolive, I focused on developing a Deep-learning solution based on U-Net for cell segmentation in holotomography.

- I optimized our training strategy by creating a relevant training and testing set.
- Coding functions for data augmentation and image preprocessing.
- Finally, I compiled my custom version of CellProfiler and developed a plugin to implement U-Net predictions in a CellProfiler pipeline.

Programming in Python, Deep-learning, Pytorch, Cell segmentation, Images analysis, CellProfiler, Anaconda

## EXPERIENCES IN INTERNSHIPS:

*From November 18<sup>th</sup> to December 20<sup>th</sup>, 2019:*

**Training: Automatize high-throughput enzymatic screening data analysis.**

**PCBIS**, Illkirch-Graffenstaden, France. Under the direction of S. Gioria

- High-Throughput enzymatic screening including sample preparation in 384-well plate and robotic pipetting.
- Data analysis, candidate selection, cherry-picking.
- UI coding to build an analysing tool generating reports.

Programming in Python, Enzymatic screening, High-throughput screening, Robotic pipetting, Excel, GUI coding

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*From July 1<sup>st</sup> to August 30<sup>th</sup>, 2019:*

**Internship: Setting up of Machine-Learning and Deep-Learning methods for bioimages analysis in high content screening.**

[ACQUIFER](#), Heidelberg, Germany. Under the direction of Dr. L.Thomas.

- Learning the basic of computer vision.
- Developing objects detection solutions based on Haar Cascade Classifier.
- Developing objects detection and classification solutions based on CNN and using transfer learning.
- Developing KNIME workflow to automatize multistep data analysis on brightfield images.

Programming in Python, Machine-learning, Deep-learning, MxNet, Objects detection, Images analysis, FIJI, KNIME

*From July 9<sup>th</sup> to August 30<sup>th</sup>, 2018:*

**Internship: Preliminary study of a new epigenetic regulator in the cell.**

[CNRS, UMR 7242](#) Illkirch-Graffenstaden, France. Under the direction of Pi. M.Weber and Dr. E.Héberlé.

PCR, Cloning, Cells culture, Flow cytometry, Design of guides RNA, Transfection, Protein, DNA and RNA purification

*From May 15<sup>th</sup> to August 31<sup>st</sup>, 2017:*

**Internship: Expression of phytochromes in E.coli and molecular characterization of purified photoactive phytochromes.**

[INSTITUTE OF BIOLOGIE II](#), Freiburg-Im-Breisgau, Germany. Under the direction of Pi. A.Hiltbrunner and Dr. C.Klose.

PCR, Cloning (Gibson cloning), Western blot, SDS-PAGE, Protein purification

## EDUCATIONS:

*From 2016 to 2020:*

**Student in biotechnologies engineering school, Option High Throughput Biotechnologies.**

[ESBS \(Ecole Supérieure de Biotechnologie de Strasbourg\)](#), Illkirch-Graffenstaden, France.

The ESBS is an engineering school that covers a broad scope of different domains in biotechnologies, including, for example, immunotechnology, biochemistry, microbiology, structural biology, and virology. The teaching includes both theory and practical aspects. Initially, I decided to specialize through internships in genetic and molecular biology. However, my fascination with new technologies later led me to gain an interest in high-throughput biotechnologies and machine learning. It was also at the ESBS that I greatly improved my English and German skills, as our courses were taught in French, English, and German.

*From 2018 to 2020:*

**Master High Throughput Biotechnologies.** With honors

[University of Strasbourg](#), France.

This master made in parallel with the three last semester of the ESBS includes formations in Data treatment, High-throughput biotechnology, Comparative biology and Human genetics.

*From 2014 to 2016:*

**Two-year intensive courses in Technology and Biology**, that prepares to the competition for entering engineering schools.

[La Martinière Duchère High school](#), Lyon, France.

This two-year intensive preparatory program, following high school, is designed to equip students with advanced academic skills and knowledge. Its primary goal is to prepare students for competitive entrance exams to engineering school, covering subjects such as biotechnologies, mathematics, chemistry, biochemistry, physic, and python programming.

*From 2012 to 2014:*

**Baccalaureate STL (Laboratory, Sciences and Technologies)**, with distinction.

[Louise Michel High school](#), Grenoble, France.

STL is a formation where I learned basics of biotechnologies and good practice of laboratory for two years.

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## **Skills:**

### **Languages:**

French : Native language  
English : Advanced  
German : Intermediate  
Spanish: Beginner

### **Computer:**

- Pack office (Word, Excel ,PowerPoint, VBA(Notions))
- Git and GitHub
- Anaconda, VS Code, Jupyter
- Python 3.x: Advanced(Data analysis, GUI coding, ML,...)
- Machine-Learning/Deep-Learning: Pytorch, Tensorflow
- Data Science: OpenCV, Scikit-Image, Scikit-Learn, Pandas, SciPy,
- Data Visualisation: Matplotlib, Seaborn, Plotly
- Gui Libraries: Tkinter, WxPython, PyQt5
- Web Development (Notions): HTML5, CSS3, JavaScript
- Others Languages (Beginner/Notions) : MySql, R, C++, Python2.x

### **Laboratory:**

- Good Practices of Laboratory
- Fluorescence microscopy
- Holotomography microscopy
- Molecular Biology: Nucleotide extraction, Cloning, Electrophoresis, Bacterial transformation
- Cell Culture: Maintenance of cell lines, Sample preparation
- Flux Cytometry: FACS, Cell Counting
- Microbiology
- Biophysics

### **Publications:**

[Dynamic label-free analysis of SARS-CoV-2 infection reveals virus-induced subcellular remodeling](#)

### **Referee:**

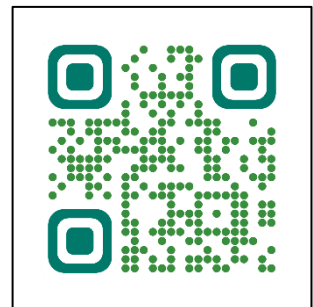
**Dr. M.Fréchin PhD**, Director, AI and Biology:  
Mathieu.frechin@nanolive.ch



My LinkedIn



My GitHub



My Website