Joris Gentinetta

gentinetta.joris@gmail.com
https://joris-gentinetta.github.io

Languages:

German (proficient), English (proficient), French (fluent), Spanish (basic fluent), Chinese (beginner)

Coding Languages:

Proficient in Python,
Familiar with SQL, C++/C

Tools:

Linux CLI, Git, Raspberry Pi, PyTorch, Tensorboard, Pandas, Numpy, Tensorflow, Scikit-learn, SciPy, Matplotlib

Skills:

Innovative ML:
(Re)invented Siamese Networks whilst working on a course assignment, (Re)invented DBSCAN whilst developing an algorithm for pattern detection at ABB.

Neural Data Analysis:
In vitro and in vivo multichannel experiments, spike sorting, connectivity and causality analysis, optogenetic stimulation.

3D Computer Vision:
Depth estimation, semantic segmentation, image classification and matching.

Big Data:
Data structures and cleaning, cloud infrastructure including AWS Sagemaker and Batch Job systems. I built and manage my own small computation cluster.

Person:

Passionate about cognition and technology since high school. Always working on some project. Active in swimming and rowing clubs, finished military service in a scout sniper unit, one year backpacking and volunteer work in Africa and Central America.

Education:

MSc Data Science ETH (2022-24): Currently focusing on statistical foundations and algorithms, specialization in 'Neural Information Processing' . Exchange to SNU, South Korea in spring 2023.
BSc Information Technology and Electrical Engineering ETH (2018-21): Top 20 percent in assessment year. During the last year of my bachelor, I worked mostly on data analysis/machine learning topics as well as neuroscience.

Academic Projects:

Bachelor project at the ETH Neurotechnology Group (2021):

Title: 'Functional connectivity analysis pipeline for anxiety related tasks – Extracting and evaluating single unit activity, spike-phase locking and movement information'
Goal: Development of a data analysis pipeline using raw electrophysiological data to evaluate drug-based change of functional connectivity between the ventral hippocampus and the prefrontal cortex during anxiety related tasks.
Result: The pipeline will be used by the Neurotechnology Group for at least one publication.

Group project at the ETH Laboratory of Biosensors and Bioelectronics (2020):

Title: 'Optogenetic stimulation of biological neuronal networks in vitro'
Goal: Development of an LCD and a DLP based stimulation setup for longtime use in an incubator.
Result: Based on our success, the supervising PhD student is now primarily using optogenetics to stimulate neurons instead of electric potentials.
Role: Initiator of the project and coordinator of the group of 5 people.

Group Project at the ETH Computer Vision and Geometry Group (2022):

Title: 'Indoor Image Retrieval Using Monocular Scene Graphs'
Goal: Solving the changing viewpoint issue in indoor localization through monocular images, by matching images through their learned scene graph representations.
Result: Scene Graph approach proven to be suboptimal, issues clearly outlined and reported.

High school final project at Stiftsschule Einsiedeln (2016):

Title: 'Construction of a Bionic Hand – Directly Controlled Robotics'
Goal: Construction of a fully functional bionic hand and sensor glove to control it.
Result: Working and under 200$ material cost. Exhibited at ETH Zurich.

Work:

Research Assistant at the ETH/UZH Institute of Neuroinformatics (2022-now):

Goal: Studying the brain mechanisms for imitation learning.
Task: Building a monkey robot with AI capabilities to interact with real Marmoset monkeys.
Role: Developing the idea, creating, coordinating, and co-supervising the student projects that lead to the completion of the robot.
Duration: 09/22 – now

Internship at ABB Semiconductors / Hitachi Energy (2021/22):

Goal: Defect classification and fault-pattern detection on semiconductor chips.
Result: Developed a Pytorch framework for efficient and automated model training, evaluation and comparison on a remote server, combined the pattern and classification projects developing a clustering algorithm considering both positional data as well as the output of the classification network and wrote a GUI to quickly analyze the output. The pipeline is now used productively.
Duration: 6 months, 09/21 – 02/22.

Teaching Assistant at the ETH Institute for Mechanical Systems (2019/20):

Independently teaching Engineering Mechanics to a group of 20 university students using self-developed material. Helping with exam correction.
Duration: 2 semesters.

Personal Projects:

Mosquito FLAK (2022):

Design, construction, and programming of a Raspberry Pi powered device to automatically shoot down mosquitos with an engraving laser.

Computation Cluster Build and Management (2022):

To be able to do the extensive experiments necessary for model evaluation and parameter tuning in the Numerai tournament, I built a cluster of secondhand servers and wrote the batch job management software for it.

Numerai Tournament (2021/22):

Continuous participation in the tournament, working with financial data to predict relative market movements using various machine learning models and architectures.