Joanna **Sliwa**

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Education

2023 – current **PhD in Machine Learning**
University of Tübingen, Philipp Hennig's Group, Tübingen, Germany
IMPRS-IS & ELLIS (other supervisors : Miguel Lobato, Frank Schneider, Claire Vernade, Antonio Orvieto)
Thesis : *Geometric and statistical software engineering tools in array-centric programming*
Topics : continual learning, Kalman filter, second-order optimization

2020 – 2022 **MSc in Neural Information Processing**
University of Tübingen, MPI IS, Bernhard Schölkopf's Group, Tübingen, Germany
Graduate Training Centre of Neuroscience
Thesis : *Independent Mechanism Analysis for High Dimensions*
Description : representation learning, analysis of the method's behaviour throughout the training and its limitations, applying the method to datasets of varying input and output dimensionality, high dimensional datasets
Final grade : 1.49, very good (1 – highest, 5 – worst)

2017 – 2020 **BSc in Neuroinformatics**
University of Warsaw, Faculty of Physics, Piotr Durka's Group, Warsaw, Poland
Thesis : *Investigation of the relation between the mechanisms of selective attention and performance of brain-computer interfaces*
Description : preprocessing of EEG data from a flanker task, creating measures using instantaneous powers to quantify the level of attention, comparison with brain-computer interfaces measures, response times analysis
Final grade : 5, very good (5 – highest, 2 – worst), average from studies : 4.63
During the first year – parallel Interdisciplinary Biotechnology Studies

Scientific Experience

December 2024 – June 2024 **ELLIS exchange, University of Cambridge, Cambridge, UK**
- Miguel Lobato 's Group,
- topic : ...,
- tasks : ...

April 2023 – November 2022 **Full-time Internship, MPI IS, Tübingen, Germany**
- Bernhard Schölkopf 's Group,
- topic : Independent Mechanism Analysis,
- tasks : applying the method to high dimensional datasets, further inspecting its functioning and comparing to other representation learning methods

jax normalizing flows

April 2022 – December 2021 **Laboratory Rotation, MPI IS, Tübingen, Germany**
- Bernhard Schölkopf 's Group,
- topic : Independent Mechanism Analysis,
- tasks : probing robustness of the method using a function deviating from the assumptions, comparison to other regularization types, running experiments on the cluster

jax normalizing flows

November 2021 – October 2021 **Essay Rotation, University of Tübingen, AI Center, Tübingen, Germany**
- Philipp Hennig's Group,
- topic : Physics-Informed Neural Networks,
- tasks : finding relevant publications, writing a review essay

LaTeX

September 2020 – August 2020 | **Summer Internship , University of Warsaw, Warsaw, Poland**
- Piotr Durka's Group
- topic : SSVEP response of subjects during calibration session,
- tasks : frequency-time analysis of EEG subjects, testing individual subject's evoked potential response based on their ability to pass the calibration session, artifacts removal

EEG | SSVEP | scipy

August 2019 | **Summer Internship, KTH, SciLifeLab, Stockholm, Sweden**
- Arvind Kumar's Group,
- topic : neuron modelling,
- tasks : testing different integrate and fire neuron models and their properties, probing firing rate based on the input current, assessing regularity of the firing rate and statistical variability for Poisson generators and correlated inputs

pynest

June 2019 – March 2019 | **Undergraduate Internship, Nencki Institute, Warsaw, Poland**
- Daniel Wojcik's Group,
- topic : reconstruction of rat's brain atlas,
- tasks : cleaning brain images from elements irrelevant to 3D reconstruction, processing vector graphics, detecting patterns in strings using basic regular expressions

svg | BeautifulSoup

February 2018 – November 2017 | **Undergraduate Internship, University of Warsaw, Warsaw, Poland**
- Jan Jablonka's Group,
- topic : interhemispheric relationships and brain plasticity after stroke,
- tasks : rat brain slices preparation using cryostat microtome, collection and staining

cryostat

Published work

2022 Joanna Sliwa, Shubhangi Ghosh, Vincent Stimper, Luigi Gresele, and Bernhard Schölkopf.
Probing the robustness of independent mechanism analysis for representation learning.
(accepted at the First Causal Representation Learning Workshop at UAI 2022)

Scholarships

2021 – 2022 DAAD Scholarship - Master Studies for All Academic Disciplines
2019 – 2020 Rector's Scholarship for the best academic achievements in the programme

Teaching and Mentoring

March 2024 – October 2023 | **Teaching Assistant, Data Literacy Course, University of Tübingen**
- gave 6 tutorials for 24 students
- supervised 6 groups of students and their projects, graded the project reports
- topics : *city ranking system, finding most reliable train route, telecommunication surveillance analysis, food product feature's correlation, analysis of train delays, topic based publication analysis*

March 2024 – October 2023 | **Supervisor of a Master's Student, Research Project, University of Tübingen**
- regular meetings and supervision of the student's progress
- topic : *Sampling-based Approximation of the Generalized Gauss-Newton Matrix*

Attended events

2024 Probabilistic Numerics Spring School, Southampton
2023 ELLIS Doctoral Symposium, Helsinki, *talk about JAX*
2022 Uncertainty in Artificial Intelligence (UAI) Conference, Eindhoven, *poster*
2019 Aspects of Neuroscience Conference, Warsaw, *co-organized*
2018 Aspects of Neuroscience Conference, Warsaw

Skills and other things

Programming **Python :** numpy, matplotlib, scipy, jupyter notebook, BeautifulSoup, pynest, sklearn, keras, jax, distrax, haiku, flax, optax
also familiar with MATLAB, LaTeX, GitHub, Weights & Biases

Extracurricular member of Neuroinformatics Club of the University of Warsaw
co-organized international conference Aspects of Neuroscience 2019

Languages Polish : native English : IELTS 8.0/9.0 German : B2 Italian, Swedish : basic