Updated: 29/09/2022

Bernard Spiegl

Helsinki, Finland

bronemos.github.io
bernard.spiegl@aalto.fi
bronemos
bernard-spiegl
Bernard Spiegl

Experience

RESEARCH ASSISTANT — **APR 2022 — JUN 2022**
Aalto University — *Helsinki, Finland*

- Researched usage of AI in music and creative processes coordinated by Koray Tahiroğlu in collaboration with Google Brain (Magenta Team).
- Implemented a deep neural network architecture that combines VQ-VAE to compress the audio and an autoregressive transformer that operates on latent representations, generating a latent response, in an endeavor to simulate musical call and response interaction.
- Technologies used – Python (NumPy, TensorFlow 2, Keras), Git, Linux, Aalto University's Triton Cluster Computer and slurm

DATA SCIENTIST INTERN — **JUL 2021 — AUG 2021**
RealNetworks Inc. — *Zagreb, Croatia*

- Researched and tested multiple deep learning architectures for speech classification (robocall detection) and recognition using transformers (ViT) and various CNNs.
- Acquainted myself with various dimensionaity reduction and data visualization methods (t-sne, PCA, k-means, SVD).
- Technologies used – Python (NumPy, PyTorch, sklearn), Git, Linux

SOFTWARE ENGINEERING INTERN — **JUL 2020 — AUG 2020**
Koncar – Power Plant and Electric Traction Engineering Inc. — *Zagreb, Croatia*

- Developed a GUI client for network communication via Modbus protocol.
- Technologies used – Python (PyQt, Asyncio), Git, Linux

SOFTWARE ENGINEERING INTERN — **JUL 2019**
Koncar – Power Plant and Electric Traction Engineering Inc. — *Zagreb, Croatia*

- Developed a web application for real time tracking and management of data on a SCADA based wind turbine systems.
- Technologies used – Web (Javascript, HTML, CSS), Python

UNDERGRADUATE TEACHING ASSISTANT — **FEB 2019 — JUL 2019**
Faculty of Electrical Engineering and Computing, University of Zagreb — *Zagreb, Croatia*

- Assisted students during laboratory examinations in Fundamentals of Electrical Engineering course.

Research

Contrastive Unpaired Translation using Focal Loss for Patch Classification — **SEP 2021**
arXiv preprint - [PDF]

Education

Master of Science - Signal Processing and Data Science — **2021 — 2023**
Aalto University — *Helsinki, Finland*

- 1st minor: Human Neuroscience and Technology
- 2nd minor: Acoustics and Audio Technology
- focus areas: Deep Learning, Audio Signal Processing (including Speech Processing, ASR & NLP), Data Analysis, Computer Vision, Neuroscience

Bachelor of Science - Computer Science — **2018 — 2021**
Faculty of Electrical Engineering and Computing, University of Zagreb — *Zagreb, Croatia*

- BSc thesis: Contrastive Unpaired Translation using Focal Loss for Patch Classification
- BSc project: Semi-Supervised Image Classification
- focus areas: Deep Learning, Computer Vision, Statistics

Volunteering

Workshop Organiser **APR 2018**
III. gymnasium *Zagreb, Croatia*
- Organised and held workshops for students on the topic of drug abuse and crime prevention among youth.

Achievements

Dean's Incentive Scholarship	Received a scholarship awarded by Aalto University for good academic progress.	2022
Google Foobar	Received an invitation to Google's Foobar secret coding challenge.	2022
UNODC Youth Forum	Participated as a representative of Croatia at an international youth forum in Vienna, Austria organised by the United Nations Office on Drugs and Crime in March of 2018.	2018
STEM Scholarship	Received a scholarship for being among the top students on matriculation exam in fields of Mathematics and Physics.	2018

Technical Skills

Advanced
Python – used in various university courses, during internships, for making a C compiler and for various other purposes, e.g. a project on Deep Neural Networks, BSc thesis, Speech Recognition project, etc. (Python specific libraries used: PyTorch, NumPy, TensorFlow, Keras, scikit-learn, SciPy, matplotlib, Pandas, asyncio, PyQt, etc.)
GIT – used for managing and storing both personal and work related projects
Linux – used as a primary OS
Ableton Live – used for personal music projects
LaTeX – used for writing thesis, project reports, etc.

Intermediate
C++ – used in the university course *Introduction to Programming*, *Algorithms and Data Structures* and *Design Patterns*
C – used in the university course *Introduction to Programming* and *Design Patterns*
R – used for a project in *Statistical Data Analysis* course and *Bayesian Data Analysis* course
Java – used in the university course *Object Oriented Programming*
SQL, SQLite, PostgreSQL – used in various university courses and during internships

Basic
Bash, Perl – used for *Scripting Languages* course and writing personal automation scripts
Matlab – used for *Acoustical Measurements* and *Acoustics and Physics of Sound* courses
COMSOL – used for various experiments and simulations in *Acoustics and Physics of Sound* course
Web technologies - Javascript (& Vue.js), HTML, CSS – used during the first internship and both in *Web and Mobile Software Development* and *Software Design* (used to make a web app for laundry services in student campuses) university courses

Other Skills and Interests

Languages Croatian (native), English (fluent - C2 (TOEFL iBT 114/120)), German (limited), Finnish (elementary), Italian (elementary)

Interests Deep Learning, Artificial General Intelligence, Neuroscience, Acoustics, Music Production and Sound Design, Guitar and Piano Playing, Sailing