






# Bernard Spiegl

Helsinki, Finland

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Bernard Spiegl 

## EXPERIENCE

### RESEARCH ASSISTANT

*Aalto University*

- Researching usage of AI in music and creative processes coordinated by Koray Tahiroğlu in collaboration with Google Brain (Magenta Team).

APR 2022 —  
Helsinki, Finland

### DATA SCIENTIST INTERN

*RealNetworks Inc.*

- Researched various deep learning methods for speech classification (robocall detection) and recognition using both NLP (transformers) and computer vision (CNNs) approaches, acquainted myself with various dimensionality reduction and data visualization methods (t-sne, PCA, k-means, SVD).
- Technologies used – Python (NumPy, PyTorch, sklearn), Git, Linux

JUL 2021 — AUG 2021  
Zagreb, Croatia

### SOFTWARE ENGINEERING INTERN

*Koncar – Power Plant and Electric Traction Engineering Inc.*

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

JUL 2020 — AUG 2020  
Zagreb, Croatia

### SOFTWARE ENGINEERING INTERN

*Koncar – Power Plant and Electric Traction Engineering Inc.*

- 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

JUL 2019  
Zagreb, Croatia

### UNDERGRADUATE TEACHING ASSISTANT

*Faculty of Electrical Engineering and Computing, University of Zagreb*

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

FEB 2019 — JUL 2019  
Zagreb, Croatia

## EDUCATION

### Master of Science - Signal, Speech and Language Processing

*Aalto University*

- 1st minor: Acoustics and Audio Technology
- 2nd minor: Human Neuroscience and Technology
- relevant courses: *Speech Processing, Speech Recognition, Statistical NLP, Large Scale Data Analysis, Methods of Data Mining, Machine Learning, Deep Learning, Audio Signal Processing, Communication Acoustics*

SEP 2021 — JUN 2023  
Helsinki, Finland

### Bachelor of Science - Computer Science

*Faculty of Electrical Engineering and Computing, University of Zagreb*

- BSc thesis: Contrastive Unpaired Translation using Focal Loss for Patch Classification (arXiv preprint - <https://arxiv.org/abs/2109.12431>)
- BSc project: analyzed impact of hyperparameters and different architectures in deep neural networks on their performance using CIFAR-10 dataset
- relevant courses: *Linear Algebra, Mathematical Analysis 1 and 2, OOP in Java, Probability and Statistics, Statistical Data Analysis, Physics, Information Processing, Algorithms and Data Structures, Design Patterns, Discrete Mathematics 1, Artificial Intelligence*

SEP 2018 — JUL 2021  
Zagreb, Croatia

## VOLUNTEERING

### Workshop Organiser

*III. gymnasium*

- Organised and held workshops for students on the topic of drug abuse and crime prevention among youth.

APR 2018  
Zagreb, Croatia

## ACHIEVEMENTS

|                   |  |      |
|-------------------|--|------|
| 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     | <p><b>Python</b> – 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, scikit-learn, SciPy, matplotlib, Pandas, asyncio, PyQt...)</p> <p><b>GIT</b> – used for managing and storing both personal and work related projects</p> <p><b>Linux</b> – used as a primary OS</p> <p><b>Ableton Live</b> – used for personal music projects</p> <p><b>LaTeX</b> – used for writing thesis, project reports, etc.</p>  |
| Intermediate | <p><b>C++</b> – used in the university course <i>Introduction to Programming, Algorithms and Data Structures</i> and <i>Design Patterns</i></p> <p><b>C</b> – used in the university course <i>Introduction to Programming and Design Patterns</i></p> <p><b>Java</b> – used in the university course <i>Object Oriented Programming</i></p> <p><b>SQL, SQLite, PostgreSQL</b> – used in various university courses and during internships</p>   |
| Basic        | <p><b>R</b> – used for a project in <i>Statistical Data Analysis</i> course</p> <p><b>Bash, Perl</b> – used for <i>Scripting Languages</i> course and writing personal automation scripts</p> <p><b>Matlab</b> – used for <i>Acoustical Measurements</i> and <i>Acoustics and Physics of Sound</i> courses</p> <p><b>COMSOL</b> – used for various experiments and simulations in <i>Acoustics and Physics of Sound</i> course</p> <p><b>Web technologies - Javascript (&amp; Vue.js), HTML, CSS</b> – used during the first internship and both in <i>Web and Mobile Software Development</i> and <i>Software Design</i> (used to make a web app for laundry services in student campuses) university courses</p> |

## OTHER SKILLS AND INTERESTS

|           |  |
|-----------|--|
| Languages | Croatian (native), English (fluent - C2 (TOEFL iBT 114/120)), German (limited), Finnish (elementary), Italian (elementary)       |
| Interests | Deep Learning, Artificial Intelligence, Machine Learning, Acoustics, Music Production and Sound Design, Guitar and Piano playing |