



# Andrés Cabero Busto

MACHINE LEARNING ENGINEER · SOFTWARE ENGINEER

Stuttgart, Germany

+4917684048732 | [cabero96@protonmail.com](mailto:cabero96@protonmail.com) | [cbr9](#) | [andres-cabero-busto](#)

## Skills

<b>Data Science, AI &amp; ML</b>	Pandas, Plotly, Matplotlib, SQL, SLURM, W&B, PyTorch, PyTorch Lightning, HuggingFace, Captum
<b>NLP</b>	LangChain, SpaCy, NLTK
<b>Programming Languages</b>	Python, Rust, JavaScript, TypeScript, HTML, CSS, LaTeX
<b>Other</b>	Spanish, English, Italian, German
	Docker, Linux, NixOS, Nix, Bash, CLI, Git

## Experience

### Sony Research

Stuttgart, Germany

MASTER THESIS STUDENT

Apr. 2023 - Oct. 2023

- Performed domain-adaptation on an open-source, self-supervised (SSL) speech recognition model.
- Applied regularization-based and replay-based continual learning methods to avoid incurring into catastrophic forgetting on the old Librispeech ASR task.

### Sony Research

Stuttgart, Germany

WORKING STUDENT

Jul. 2022 - Mar. 2023

- Developed a natural language grammar based on weighted finite-state transducers (WFSTs) and the Thrax framework, similar to NVIDIA NeMo grammars, that enabled a 10% WER improvement for the pre-existing Italian ASR system.
- Time-aligned and transcribed speech utterances using Label Studio for use in text-to-speech (TTS) model training.

### University of Stuttgart

Stuttgart, Germany

PYTHON DEVELOPER

Jul. 2022 - Dec. 2022

- Developed the core of a toolkit for academic NLP research in lexical semantic change detection (LSCD), openly available at <https://github.com/ChangeIsKey/LSCDBenchmark>

### University of Stuttgart

Stuttgart, Germany

LINUX SYSTEM ADMINISTRATOR

Jul. 2022 - Mar. 2022

- Administration and maintenance of Linux servers and users.

### University of Stuttgart

Stuttgart, Germany

DATA ANNOTATOR

Nov. 2021 - Jan. 2022

- Data annotator for the first Shared Task of Lexical Semantic Change Discovery in Spanish (<https://fdzr.github.io/lscdiscovery/>). The process involved annotating the degree of difference between uses of the same word based on the surrounding context, using a Likert scale.
- Identified some problems in the annotation platform, and developed a small JavaScript solution to help my teammates and I work more efficiently.

## Projects

### Model Compression using Explainable AI (XAI)

Stuttgart, Germany

INSTITUT FÜR MASCHINELLE SPRACHVERARBEITUNG (UNIVERSITY OF STUTTGART)

- Compressed a Bi-LSTM trained for a speech emotion recognition task.
- Using XAI methods, we realized that more than half of the input features were completely irrelevant, thus allowing us to reduce the number of parameters of the network.
- Because we were able to reduce the parameters in this way, this also allowed us to experiment with other hyperparameters more efficiently.
- The final model preserved the exact same accuracy of the original model, but with more than half of its parameters.

# Education

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## M.Sc. Computational Linguistics

Apr. 2021 - Oct. 2023

INSTITUT FÜR MASCHINELLE SPRACHVERARBEITUNG (UNIVERSITY OF STUTTGART)

Stuttgart, Germany

- Achieved an in-depth understanding of modern deep learning (DL) and natural language processing (NLP) techniques.

## B.A. Linguistics

Sept. 2016 - Dec. 2020

UNIVERSITY OF CÁDIZ

Cádiz, Spain

- Took several courses related to programming, natural language processing (NLP) and computer science (CS), achieving honors in several of them.

# Certifications

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## PyTorch For Deep Learning

Apr. 2022

[HTTPS://WWW.UDEMY.COM/CERTIFICATE/UC-c8142260-a945-4f41-91f5-d213671b8493/](https://www.udemy.com/certificate/UC-c8142260-a945-4f41-91f5-d213671b8493/)

Online

## Mathematics For Machine Learning

Mar. 2022

[HTTPS://WWW.COURSERA.ORG/ACCOUNT/ACCOMPLISHMENTS/SPECIALIZATION/CERTIFICATE/DJPXWT9X9KVS](https://www.coursera.org/account/accomplishments/specialization/certificate/DJPXWT9X9KVS)

Online

## Neural Networks and Deep Learning

Dec. 2021

[HTTPS://WWW.COURSERA.ORG/ACCOUNT/ACCOMPLISHMENTS/CERTIFICATE/JXLQNFEH3H9S](https://www.coursera.org/account/accomplishments/certificate/JXLQNFEH3H9S)

Online

## Linear Algebra

Mar. 2020

[HTTPS://WWW.UDEMY.COM/CERTIFICATE/UC-0d00a3f9-2a0c-4881-a50e-4341fa30b055/](https://www.udemy.com/certificate/UC-0d00a3f9-2a0c-4881-a50e-4341fa30b055/)

Online

## Probability & Statistics

Mar. 2020

[HTTPS://WWW.UDEMY.COM/CERTIFICATE/UC-BHG909SJ/](https://www.udemy.com/certificate/UC-BHG909SJ/)

Online