




LAIA TARRÉS BENET

PhD Candidate
Telecommunications
ENGINEER

CONTACT

 +34 649454699

 laia.tarres@upc.edu

 [LaiaTarres](https://github.com/LaiaTarres)

 [laia-tarres](https://www.linkedin.com/in/laia-tarres)

 laiatarres.com

PROFILE

I am interested in Deep Learning applied to **Computer Vision** and **Multi-modal Language Processing**. Specifically, some of the problems that I find interesting are: sign language translation, human pose estimation, implementation of generative models, language modeling and applicability of foundation models. My research experience includes: U-Net for skin lesion visual classification, image colourisation with GANs and **automatic sign language translation** with **Transformers**.

EDUCATION

Universitat Politècnica de Catalunya (UPC), ETSETB, Barcelona, Spain

PhD in Computer Architecture, sep 2021 - present

Advisors: Prof. Xavier Giró-i-Nieto (Image Processing Group/ Amazon Research) and Prof. Jordi Torres (Barcelona Supercomputing Center).

Areas of study: Computer Vision, Natural Language Processing, Transformers.

Research projects: Speech2Signs, research on automatic speech to sign language translation and viceversa. X-prize rainforest, Providence Plus team: how to apply computer vision to study and conserve rainforests.

- **Researched** models that enable automatic sign language translation.
- **Published and presented work** on automatic sign language translation and Sign Language Topic Detection. Publications [1], [2].
- Produced **software** toolboxes related to sign language understanding.
- Awarded the **Research Grant** PRE2020-094223 to develop the Thesis.
- **Mentored** multiple students on their undergraduate research: Andrea Iturralde, Patricia Cabot, Alvaro Francesc Budria, Javier Sanz.

M.S. in Advanced Telecommunications, sep 2019 - july 2021

The Audiovisual Systems track provides in depth subjects about deep learning applied to images, video, speech and text, as well as fundamental ICT engineering skills, such as software development, traditional machine learning and entrepreneurship.

Thesis: GAN-based image colourisation with Feature Reconstruction Loss. Directed by Prof. Xavier Giró-i-Nieto and Marta Mrak.

Telecommunications Engineering, sep 2015 - july 2019

Learned the foundation on Maths, Physics, Programming, Electronics, Signal Processing and Transmissions.

Thesis: Skin Lesion Classification with Residual Neural Network Ensemble. Directed by Prof. Verónica Vilaplana and Dr. Marc Combalia.

PROFESSIONAL EXPERIENCE

CO-DIRECTOR POSTGRADUATE COURSE ON ARTIFICIAL INTELLIGENCE WITH DEEP LEARNING: September 2022-Present

Director, together with Montse Pardàs on the 8th edition the Postgraduate Course

- Curriculum planning, budgeting and scheduling of instructors.
- Providing support to both instructors and students.

RESEARCH ASSISTANT AT IRI: March 2021-August 2021

Contributed to the **Speech2Sign** project by implementing a transformer to generate sign language pose estimators from text. Under the supervision of Prof. Francesc Moreno and Prof. Xavier Giró-i-Nieto.

- Researched models that enable automatic sign language generation from text.
- Improving, deploying and adapting the Progressive Transformer model for the How2Sign dataset.

TECHNOLOGIES

Main: **Python, Pytorch**, Fairseq, Bash, Git.

Secondary: Keras, Matlab, Arduino, Java, C.

LANGUAGES

Catalan - native

Spanish - native

English - C1-2014

SERVICE

Volunteer - WiCV @NeurIPS 2020

Volunteer - DLBCN 2021

Organizer- DLBCN 2022

HOBBIES

Cooperation - part of **AuCoop**, association that organizes IT projects in developing countries.

Telecogresca- directive board and Design team for a non-lucrative organization that build the biggest university music festival in Spain.

Volleyball - played both court and beach modalities.

Music - play the euphonium and trombone.

RESEARCH ASSISTANT AT BBC: March 2020-May 2021

Researcher for Historical Recovery of colourised media at the British Broadcasting Company. Under the guidance of Marta Mrak, Marc Górriz and Xavier Giró-i-Nieto.

- Finding, improving and deploying a Generative Adversarial Model to colourise still images adding feature reconstruction loss. Publication [3].

RESEARCH ASSISTANT AT UPC: November 2019-July 2020

Researcher for the Group of Image Processing. Under the guidance of Verónica Vilaplana.

- Finding and deploying a Bayesian U-Net with epistemic uncertainty feedback for detection of Tropical Diseases in microscopic images.

INTERNSHIP AT MINSAIT: February 2019-July 2019

Data Scientist apprentice within the Support to Universities and Research project.

- Update and structure the database through PLSQL queries, and use of apex and microstrategy to present the final processed database with indicators.

DATA ANALYST AT CIT UPC: July 2018-October 2018

Cyberbullying detection in teenagers in mobile apps. Under the guidance of Asunción Moreno, Antonio Bonafonte and Igor Jauk. Publication [4].

- Acquire and structure a database for cyberbullying detection.

PUBLICATIONS

[1] **Tarrés, L***; Gállego, GI*; Giró-i-Nieto X; Torres J. Tackling Low-Resourced Sign Language Translation: UPC at WMT-SLT 22. @WMT, EMNLP 2022.

[2] Budria A; **Tarrés L**; Gállego GI; Moreno F; Torres J; Giró-i-Nieto X. Topic Detection in Continuous Sign Language Videos. @AVA, CVPR 2022.

[3] **Tarrés, L**; *Giró-i-Nieto, X, Mrak,M; Górriz, M.* Working on image colourisation. Poster @WiCV, CVPR 2021.

[4] *Moreno, A.; Bonafonte, A.; Jauk, I.;* **Tarrés, L.**; *Pereira, V.* Corpus for cyberbullying prevention. *IberSPEECH 2018.*

*Equal contribution

TEACHING EXPERIENCE

Courses:

- Postgraduate Course on artificial Intelligence, UPC School (2021-present)
- Undergraduate course of Data Science and Engineering, UPC (2021-present)
- Master in Advanced Telecommunication Technologies, UPC (2021-present)
- Master in Big Data, Barcelona Technology School (2021-present)
- Windmill ITN workshop at CTTC (March 2022)
- Deep Learning conference for Insight Center at Dublin City University (May 2022)

Selection of lessons imparted:

- Introduction to Deep Learning: Backpropagation, Tensors, Interpretability, MLP, CNN, Monitoring. *Lab instructor.*
- Sequence Modeling: RNN, Attention, Transformers. *Lab instructor.*
- **Generative** modeling: self-supervised, GAN, VAE and Diffusion models. *Main theory and lab instructor.*
- **Speech**: Introduction to Speech, Speech Enhancement, ASR. *Lab instructor.*
- Recommender systems: GCN and Recommender systems. *Lab instructor.*