

Umberto Cappellazzo

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EDUCATION

University of Trento

Trento, Italy

Ph.D. in Information Engineering and Computer Science

Nov. 2021–ongoing

- Advisors: Daniele Falavigna, Alessio Brutti
- Research interests: continual learning for audio and speech processing; multi-modal (i.e., audio-language) continual learning; parameter-efficient transfer learning of audio/speech (e.g., Adapters, Mixture of Adapters, LoRA); LLMs for audio-visual learning tasks; large-scale Multimodal LLMs.

University of Padua

Padua, Italy

MSc in Telecommunication Engineering

2016–2019

- Advisors: Michele Rossi, Matteo Gadaleta
- Thesis Title: A Deep Learning-Based ECG Delineator: Evaluation and Comparison on Standard Databases

University of Padua

Padua, Italy

BSc in Information Engineering

2013–2016

- Advisor: Nicola Laurenti
- Thesis Title: Message Authentication over an Ideal or Noisy Channel

WORK EXPERIENCE

Jelinek Summer Workshop on Speech and Language Technology (JSALT)

Le Mans, France

Junior researcher in the FST group

June 2023 –August 2023

- Junior researcher for the “*Finite state methods with modern neural Architectures for speech applications and beyond*” group at JSALT2023 in Le Mans, France. I worked on the integration of early-exit techniques to make the training and inference of CTC/MMI systems dynamical. Our group included people from Google, JHU, Telecom Paris to name a few. More information available [here](#).

Imperial College London

London, UK

Research Intern, *Audio-visual speech recognition meets LLMs*

February 2024 –May 2024

Supervisor: Stavros Petridis (ICL/Meta AI), Pingchuan Ma (Meta AI)

- The internship revolves around the efficient integration of LLMs for audio-visual speech recognition.

SKILLS

- **Programming Languages:** Python (advanced), Java (basic), HTML (basic), Matlab (basic)
- **ML/DL Toolkits/Libraries:** PyTorch (advanced), NumPy, HF Transformers, Matplotlib. Good experience with CL libraries like Continuum and Avalanche
- **ASR Frameworks:** good experience with SpeechBrain and K2/icefall
- **Other:** Git, Docker

LANGUAGES

- **Italian:** mother tongue
- **English:** C1
- **TOEFL:** 100/120

MENTORSHIP & PROFESSIONAL SERVICES

- **Reviewer:** ICASSP 2024 [Workshop XAI-SA](#)
- **Co-supervision:** I co-supervised a MSc student from the University of Bologna (thesis title: “*On the use of Prompting for Fine-Tuning Neural Models for Speech Processing*”)

PUBLICATIONS

- [1] U. **Cappellazzo**, D. Falavigna, and A. Brutti, “[Efficient Fine-tuning of Audio Spectrogram Transformers via Soft Mixture of Adapters](#)”, *arXiv preprint*, 2024.
- [2] G. A. Wright, U. **Cappellazzo**, S. Zaiem, D. Raj, L. Ondel Yang, D. Falavigna, and A. Brutti, “[Training dynamic models using early exits for automatic speech recognition on resource-constrained devices](#)”, *Self-supervision in Audio, Speech and Beyond (SASB) Workshop, ICASSP*, 2024.
- [3] M. Yang, U. **Cappellazzo**, X. Li, S. Watanabe, and B. Raj, “[Improving continual learning of acoustic scene classification via mutual information optimization](#)”, *ICASSP 2024*, 2024.
- [4] M. Yang, X. Li, U. **Cappellazzo**, S. Watanabe, and B. Raj, “[Evaluating and Improving Continual Learning in Spoken Language Understanding](#)”, *arXiv preprint*, 2024.
- [5] U. **Cappellazzo**, D. Falavigna, and A. Brutti, “[An Investigation of the Combination of Rehearsal and Knowledge Distillation in Continual Learning for Spoken Language Understanding](#)”, *Interspeech (Poster)*, 2023.
- [6] U. **Cappellazzo**, D. Falavigna, A. Brutti, and M. Ravanelli, “[Parameter-Efficient Transfer Learning of Audio Spectrogram Transformers](#)”, *arXiv preprint*, 2023.
- [7] U. **Cappellazzo**, E. Fini, M. Yang, D. Falavigna, A. Brutti, and B. Raj, “[Continual Contrastive Spoken Language Understanding](#)”, *arXiv preprint*, 2023.
- [8] U. **Cappellazzo**, M. Yang, D. Falavigna, and A. Brutti, “[Sequence-Level Knowledge Distillation for Class-Incremental End-to-End Spoken Language Understanding](#)”, *Interspeech (Oral)*, 2023.

See [Google Scholar](#) for my Google Scholar profile.