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 continual learning; parameter-efficient transfer learning of audio/speech and audio-visual (e.g., Adapters, Mixture of Adapters, LoRA)

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 PETL　　　　　　　　　　　　　　February 2024 –May 2024
Supervisor: Stavros Petridis (ICL/Meta AI)

- The internship revolves around the study of parameter-efficient transfer learning (PETL) methods (e.g., adapters, mixture of adapters, LoRA) for audio-visual tasks.

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] 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.

[2] M. Yang, U. **Cappellazzo**, X. Li, S. Watanabe, and B. Raj, "Improving continual learning of acoustic scene classification via mutual information optimization", *to appear at ICASSP 2024*, 2024.

[3] 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.

[4] U. **Cappellazzo**, D. Falavigna, A. Brutti, and M. Ravanelli, "Parameter-Efficient Transfer Learning of Audio Spectrogram Transformers", *arXiv preprint*, 2023.

[5] U. **Cappellazzo**, E. Fini, M. Yang, D. Falavigna, A. Brutti, and B. Raj, "Continual Contrastive Spoken Language Understanding", *arXiv preprint*, 2023.

[6] 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.