

# Umberto Michieli

I am a Computer Vision and Deep Learning research scientist. My goal is to contribute to the adoption of AI in everyday life and to its adaptation to meet human needs.

*Last Update: February 6, 2022.*

## Work Experience

- Sep. 2021 – **Adjunct Professor**, *University of Padova*.  
Jan 2022 *Neural Networks and Deep Learning*, M.Sc. course (partial)
- Sep. 2020 – **Internship as AI Research Engineer**, *Samsung Research UK*.  
May 2021 Federated Learning of Computer Vision Models. Supervisor: Dr Mete Ozay.  
As part of the personalized AI/ML team, I have been working on developing and testing new federated optimization frameworks.
- Improved federated learning optimizers in Tensorflow/Pytorch by  $\sim 10\%$  of accuracy via self-attention and latent-level regularization with a  $\sim 0.5\%$  computation increase.
  - Won the bronze prize at *Samsung Research UK Innovation Challenge*.
  - Contributed to hiring a new Ph.D. intern.
- Feb. – Jul. **Visiting Researcher**, *Technische Universität Dresden (TUD)*.  
2018 Experimental research on link prediction (LP) on real and synthetic complex networks. Supervisor: Prof. Carlo Vittorio Cannistraci.
- Implemented new LP algorithms based on local geometry: improved accuracy by 10% and reduce complexity by  $\times 10$ .
  - Gathered the largest up-to-date collection database of  $\sim 1000$  complex networks.
- 2018-22 **Teaching Assistant**, *University of Padova*.  
Machine Learning (junior TA: 18/19; TA: 19/20 and 21/22), M.Sc. course.  
Computer Vision (junior TA: 18/19), M.Sc. course.

## Education

- Oct. 2021–  
present **Postdoctoral Research Grant**, *University of Padova*.  
Research topic: "Semantic Scene Understanding in the Wild".
- Developing algorithms addressing foundation AI problems such as: continual learning, domain adaptation, federated learning, coarse-to-fine learning.
  - Co-leading a group of five Ph.D. students on related topics.
  - Attracting new project collaborations, funding, and Ph.D. students to the Lab.
- Oct. 2018 – **Ph.D. in Information Engineering**, *University of Padova*.  
Oct. 2021 Research topic: "Visual Understanding across Semantic Groups, Domains and Devices". Supervisor: Prof. Pietro Zanuttigh. Thesis to be defended on March 10-th, 2022.
- Published first-authored papers at prestigious venues (CVPR, ECCV, ICCV).
  - Supervised more than 20 M.Sc. final projects.
- Seasonal Schools**, DeepLearn2021, M2L2020, AI-DLDA2020, REGML2020, GTTI2020, ICVSS2019, GTTI2019, CMMRS2018.
- Sep. 2016– **M.Sc. in Telecommunication Engineering**, *University of Padova*.  
Sep. 2018 Grade: 110/110 Summa cum Laude.  
Thesis: "Link Prediction on Real and Synthetic Complex Networks".

Oct. 2013 – **B.Sc. in Information Engineering, University of Padova.**  
Jul. 2016 Grade: 110/110 Summa cum Laude.  
Thesis: "Correlation and Coherence Analysis between EEG and EMG Signals".

---

## Academic Experience

### Program Chair and Reviewer Activity.

- *Journals*: **IEEE** TIP, TMM, TNNLS, TETC, TIV; **Elsevier** INFFUS, PR; **ACM** TOMM; **MDPI** Remote Sensing, Applied Sciences; **ISPRS** Journal of Photogrammetry and Remote Sensing.
- *Main conferences*: ICPR, ICASSP, CPHS, BGM.
- *Workshops*: CVPRW on Continual Learning, ECCVW on Transferring and Adapting Source Knowledge, ICMLW on Continual Learning, IJCAIW on Continual Semi-Supervised Learning.

### General Chair Activity.

- 2021 GTTI workshop – Deep signal processing for a safer world.

### Invited Talks.

- 01/2022 *Visual Understanding across Semantic Groups, Domains and Devices* - Computer Vision seminar, Carnegie Mellon Univ.
- 11/2021 *Remembering the Past while Learning the Future: Continual Learning in Deep Neural Networks* - DEITalks series, Univ. of Padova.
- 10/2021 *Visual Understanding across Semantic Groups, Domains and Devices in Healthcare Applications* - Microsoft Research Cambridge.
- 10/2021 *Visual Understanding across Semantic Groups, Domains and Devices* - Politecnico Univ. of Turin.
- 07/2021 *Federated Learning in Computer Vision* - Computer Vision Talks Series.
- 06/2021 *Internal Feature Representations in Federated Learning* - Univ. of Padova.

---

## Fellowships and Awards

- 2021 Selected for participation at the Doctoral Consortium at ICCV 2021.
- 2021 Winner of IEEE Young Professional pitch contest *My Research in 5 Minutes*.
- 2021 Winner of a travel award from MDPI Computers.
- 2021 Bronze Prize at Samsung Research UK Innovation Challenge.
- 2021 Winner of Photo Competition at Samsung Research UK (available at [my website](#)).
- 2020 ICPR2020 Free Attendance Pass from the General Chairs.
- 2020 Collaborator of SEED project "Semantic Segmentation in the Wild" (EUR 33K).
- 2018 Selected and awarded a fellowship from the organizers of "The Cornell, Maryland, Max Planck Pre-doctoral Research School" (CMMRS).
- 2018 Ph.D. fellowship (3 years). Selection based on project proposal and oral exam.
- 2018 Fellowship by Technische Universität Dresden to attend NetSci 2018.
- 2018 Erasmus fellowship at Technische Universität Dresden.
- 2018 Scholarship grant "Mille e una lode" for merit by University of Padova.

---

## Skills

- **Programming**: Python, MATLAB (previous experience in java, javascript, C++, ns-3).
- **Python libraries**: Pytorch, Tensorflow, Keras, Scikit-learn, Jupyter Notebooks, Pandas.
- **Software development**: Bash, Batch, Git, Pycharm, Scrum, Jira, GitHub Projects.
- **Typesetting**:  $\LaTeX$ .
- **Infrastructure**: HPC clusters, Docker.
- **Soft skills**: project management, teamwork, mentoring and coaching, public speaking.
- **Languages**: Italian (native), English (fluent), Spanish (basic).

---

## Publications

### Journals

- [1] U. Michieli and P. Zanuttigh, "Knowledge Distillation for Incremental Learning in Semantic Segmentation," *Elsevier Journal on Computer Vision and Image Understanding (CVIU)*, 2021.
- [2] M. Toldo, U. Michieli, G. Agresti, and P. Zanuttigh, "Unsupervised Domain Adaptation for Mobile Semantic Segmentation based on Cycle Consistency and Feature Alignment," *Image and Vision Computing (IMAVIS)*, 2020.
- [3] M. Toldo, A. Maracani, U. Michieli, and P. Zanuttigh, "Unsupervised Domain Adaptation in Semantic Segmentation: a Review ," *Technologies*, vol. 8, no. 35, 2020.
- [4] M. Mel, U. Michieli, and P. Zanuttigh, "Incremental and Multi-Task Learning Strategies for Coarse-to-Fine Semantic Segmentation," *Technologies, special issue on Computer Vision and Image Processing Technologies*, vol. 8, no. 1, 2020.
- [5] U. Michieli, M. Biasetton, G. Agresti, and P. Zanuttigh, "Adversarial Learning and Self-Teaching Techniques for Domain Adaptation in Semantic Segmentation," *IEEE Transactions on Intelligent Vehicles (T-IV)*, vol. 5, no. 3, pp. 508–518, 2020.

### Conferences

- [6] A. Maracani\*, U. Michieli\*, M. Toldo\*, and P. Zanuttigh, "RECALL: Replay-based Continual Learning in Semantic Segmentation," *International Conference on Computer Vision (ICCV)* [acceptance rate=25.9%], 2021.
- [7] U. Michieli and M. Ozay, "Are All Users Treated Fairly in Federated Learning Systems?," *Conference on Computer Vision and Pattern Recognition (CVPR), Workshop on Responsible Computer Vision (RCV)*, 2021.
- [8] F. Barbato, M. Toldo, U. Michieli, and P. Zanuttigh, "Latent Space Regularization for Unsupervised Domain Adaptation in Semantic Segmentation," *Conference on Computer Vision and Pattern Recognition (CVPR), Workshop on Autonomous Driving (WAD)*, 2021.
- [9] U. Michieli and P. Zanuttigh, "Continual Semantic Segmentation via Repulsion-Attraction of Sparse and Disentangled Latent Representations," *Computer Vision and Pattern Recognition (CVPR)* [acceptance rate=23.6%], 2021.
- [10] M. Toldo, U. Michieli, and P. Zanuttigh, "Unsupervised Domain Adaptation in Semantic Segmentation via Orthogonal and Clustered Embeddings," *Winter Conference on Applications of Computer Vision (WACV)* [acceptance rate=28%], 2021.
- [11] U. Michieli, E. Borsato, L. Rossi, and P. Zanuttigh, "GMNet: Graph Matching Network for Large Scale Part Semantic Segmentation in the Wild," *European Conference on Computer Vision (ECCV)* [acceptance rate=26%], 2020.
- [12] T. Spadotto, M. Toldo, U. Michieli, and P. Zanuttigh, "Unsupervised Domain Adaptation with Multiple Domain Discriminators and Adaptive Self-Training," *International Conference on Pattern Recognition (ICPR)* [first round acceptance rate=35.6%], 2020.
- [13] U. Michieli and P. Zanuttigh, "Incremental Learning Techniques for Semantic Segmentation," *International Conference on Computer Vision (ICCV), Workshop on Transferring and Adapting Source Knowledge in Computer Vision (TASK-CV)*, 2019.

- [14] U. Michieli, M. Camporese, A. Agiollo, G. Pagnutti, and P. Zanuttigh, "Region Merging Driven by Deep Learning for RGB-D Segmentation and Labeling," *International Conference on Distributed Smart Cameras (ICDSC)*, 2019.
  - [15] M. Biasetton, U. Michieli, G. Agresti, and P. Zanuttigh, "Unsupervised Domain Adaptation for Semantic Segmentation of Urban Scenes," *Conference on Computer Vision and Pattern Recognition (CVPR), Workshop on Autonomous Driving (WAD)*, 2019.
  - [16] U. Michieli and L. Badia, "Game Theoretic Analysis of Road User Safety Scenarios Involving Autonomous Vehicles," *IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)*, pp. 1377–1381, 2018.
  - [17] G. Cisotto, U. Michieli, and L. Badia, "A coherence study on EEG and EMG signals," *IEEE Global Wireless Summit (GWS)*, pp. 372–376, 2016.
- [Book Chapters](#)
- [18] U. Michieli, M. Toldo, and P. Zanuttigh, "Unsupervised Domain Adaptation and Continual Learning in Semantic Segmentation," *Advanced Methods and Deep Learning in Computer Vision, Elsevier*, 2021.

\* indicates equal contribution.

*I hereby authorize the processing of the personal data contained in this CV in compliance with the Italian Personal Data Protection Code (Legislative Decree no. 196 of 30 June 2003).*