

Open position for PhD: Domain adaptation for structured prediction tasks



We are looking for highly motivated students that are interested in pursuing a PhD (and if possible an internship before) on domain adaptation for structured prediction tasks. The internship/PhD is part of the ODACE project funded by the French National Research Agency (ANR).

Advisors: [Dr. Stéphane Lathuilière](#) (Multimedia team, Telecom Paris) and [Dr. Vicky Kalogeiton](#) (GeoViC team, LIX, École Polytechnique).

Topic: In real applications, the test data distribution is often different from the training data and this distribution shift affects the performance of deep learning methods. This shift can be due to many factors such as changes in illumination, image quality, point of view, or camera. In this context, Domain Adaptation (DA) has emerged as an efficient learning technique to address this problem. Most previous works on DA focus on classification settings. This limitation severely constrains potential applications. In this project, we have a particular interest in structured prediction tasks, such as depth estimation and instance segmentation, where the goal is to predict structured objects, rather than single discrete or real values. With respect to classification, structured tasks offer additional cues that can be modeled to guide adaptation. Indeed, adaptation can be constrained in such a way that it leads to predictions with coherent structures.

Skills and profile: We are looking for a strongly motivated master's student with an interest in computer vision and deep learning. Candidates interested in this position must hold a master degree in computer science or applied mathematics. They are expected to demonstrate independent research capabilities and to have excellent programming skills in python/pytorch/tensorflow, and excellent writing and communication skills. A successful project can lead to a PhD supervised jointly by Telecom Paris and École Polytechnique. Previous research work on computer vision is a plus.

Environment: This PhD/internship is part of the ODACE project funded by the French National Research Agency (ANR). You will be joining the multimedia team, an international team of researchers and students at Telecom Paris. You will be supervised by [Dr. Stéphane Lathuilière](#) and [Dr. Vicky Kalogeiton](#) (GeoViC, LIX, École Polytechnique).

Application: Potential applicants should send their complete CV and transcripts of grades to Stéphane Lathuilière at stephane.lathuiliere@telecom-paris.fr and Vicky Kalogeiton at vicky.kalogeiton@polytechnique.edu. We may also request the email of two referees.

References:

- [1] Fabio Maria Carlucci, Lorenzo Porzi, Barbara Caputo, Elisa Ricci, and Samuel Rota Bulò. Autodial: Automatic domain alignment layers. In IEEE ICCV, 2017.
- [2] Yaroslav Ganin and Victor Lempitsky. Unsupervised domain adaptation by backpropagation. ICML, 2015.
- [3] Yanghao Li, Naiyan Wang, Jianping Shi, Jiaying Liu, and Xiaodi Hou. Revisiting batch normalization for practical Domain adaptation. ICLR Workshop, 2016.
- [4] Zak Murez, Soheil Kolouri, David Kriegman, Ravi Ramamoorthi, and Kyunghyun Kim. Image to image translation for domain adaptation. In IEEE CVPR, 2018.
- [5] Markus Wulfmeier, Alex Bewley, and Ingmar Posner. Incremental adversarial domain adaptation for continually changing environments. In ICRA, 2018.