



University of Pavia

Ph.D. School of Electronics, Computer Science and Electrical Engineering

SEMINAR

Domain adaptation in remote sensing image classification: making the most out of your data

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Department of Electrical, Computer and Biomedical Engineering**

Being able to process images timely and in an accurate manner is necessary for remote sensing to be useful in applications with high societal value. But these two objectives are somehow contradictory, since to achieve high performance one should opt for a supervised method based on image-specific terrestrial measurements, while to achieve rapid mapping one would prefer either to deploy an unsupervised method or to rely on pre-trained models. This last possibility seems particularly appealing, but can also lead to model failure if the spectra observed in the new acquisition are radically different from those found in the first (typically because of changing atmospheric or illumination conditions).

In this talk, I will discuss opportunities to make the performance and speed requirements co-exist, by performing an intermediate step of adaptation of the spectra recorded on the newly acquired image. This adaptation step makes these spectra more similar to those already available on pre-existing acquisitions. The methods I will present are based on the modelling of image spaces as a series of data manifolds and have the objective to align them to each other. By such alignment, they allow to classify new acquisitions with existing models, independently from acquisition conditions or slight sensor differences.

Specifically, I will discuss two adaptation methods based on discriminative projections and show their performance on selected case studies in multimodal image classification and change detection.

Bio: Devis Tuia received a Ph.D. in Environmental Sciences at University of Lausanne in 2009. He was then a postdoc researcher at the University of València, Spain, the University of Colorado, Boulder, CO, USA and EPFL Lausanne. Since 2014, he is Assistant Professor at the University of Zurich. His research focuses on information extraction and data fusion of remote sensing images using machine learning algorithms. Visit <http://devis.tuia.googlepages.com/> to maybe know more about him, but mostly about multimodal remote sensing.

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Seminar in English

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