

PhD program in Statistics

DSS Statistics Seminar

March 3, 2023, 12:00

<https://uniroma1.zoom.us/j/86881977368?pwd=SWRFcVFjMDZTa0lXZk05TE1zNm5adz09>
Passcode: 432940

Spatio-Temporal Semantic Partitions of the Land Surface through Deep Embeddings

Carlos Echegoyen Arruti

Spatial Statistics Group, Public University of Navarre

Temporal sequences of satellite images constitute a highly valuable and abundant resource to analyze a given region. However, the labeled data needed to train most machine learning models are scarce and difficult to obtain. In this context, we investigate a fully unsupervised methodology that, given a sequence of images, learns a semantic embedding and then, creates a partition of the ground according to its semantic properties and its evolution over time. We illustrate the methodology by conducting the semantic analysis of a sequence of satellite images of a region of Navarre (Spain). The proposed approach reveals a novel broad perspective of the land, where potentially large areas that share both a similar semantic and a similar temporal evolution are connected in a compact and well-structured manner. The results also show a close relationship between the allocation of the clusters in the geographic space and their allocation in the embedded spaces. The semantic analysis is completed by obtaining the representative sequence of tiles corresponding to each cluster, the linear interpolation between related areas, and a graph that shows the relationships between the clusters, providing a concise semantic summary of the whole region.



SAPIENZA
UNIVERSITÀ DI ROMA