



WedPM1-5 Topological and Graph Based Clustering Methods 1

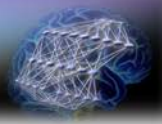
Chair: Rushed Kanawati, Nistor Grozavu

Room: Conference Room IV

Tutorial14:00 - 15:00 Topological and Graph Based Clustering: Recent Algorithmic
AdvancesRushed Kanawati¹, Nistor Grozavu¹¹ A3-LIPN, University Sorbonne Paris Cité

15:00 - 15:20 Parcellating whole brain for individuals by simple linear iter-
ative clusteringJing Wang¹, Zilan Hu², Haixian Wang¹¹Southeast University ²School of Mathematics and Physics,
Anhui University of Technology, Maanshan, Anhui 243002,
PR China

15:20 - 15:40 Overlapping Community Structure Detection of Brain Func-
tional Network Using Non-negative Matrix FactorizationXuan Li¹, Zilan Hu², Haixian Wang¹¹Southeast University ²School of Mathematics and Physics,
Anhui University of Technology, Maanshan, Anhui 243002,
PR China



WedPM2-5 Topological and Graph Based Clustering Methods 2

Chair: Rushed Kanawati, Nistor Grozavu

Room: Conference Room IV

16:00 - 16:20 Collaborative-based multi-scale clustering in very high resolution satellite Images

Jeremie Sublime¹ Antoine Cornuéjols¹ Younes Bennani²¹AgroParisTech ²University Paris 13

16:20 - 16:40 Towards Ontology Reasoning for Topological Cluster Labeling
Hatim Chahdi¹, Nistor Grozavu²

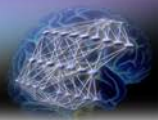
¹UMR Espace-Dev & LIPN ²LIPN, Paris 13 University

16:40 - 17:00 Overlapping community detection using core label propagation and belonging function

Jean-Philippe Attal¹, Maria Malek¹, Marc Zolghadri²¹EISTI : École internationale des sciences du traitement de l'information ²SUPMECA

17:00 - 17:20 A new clustering algorithm for dynamic data
Parisa Rastin¹, Tong Zhang¹, Guenael Cabanes¹

¹Université Paris 13



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Tutorial**Topological and Graph Based Clustering: Recent Algorithmic Advances**Rushed Kanawati¹, Nistor Grozavu¹¹A3-LIPN, University Sorbonne Paris Cité**Abstract**

One of the main tasks in the field of high dimensional data analysis and exploration is to compute simplified, usually visual, views of processed data. Clustering and projection are two main methods classically applied to achieve this kind of tasks. Clustering algorithms produce a grouping of data according to a given criterion such that similar data items are grouped together. Projection methods represent data points in a low-dimensional space such that clusters and the metric relationships of the data items are preserved as faithfully as possible. However, in the actual era of big data and connected devices, a lot of datasets are shaped in form of large-scale dynamic attributed graphs. Non relational data can also be shaped in form of graphs by applying similarity-based graph construction approaches. New approaches for data clustering and projection are then required. In this tutorial we make the point on the latest algorithmic advances in the field of graph-based and topological clustering approaches.

Tutorial outline :

- 1- Introduction
- 2- Building graphs from data
- 3- Community detection in complex networks
- 4- Topological clustering approaches
 - 4.1 Spectral clustering methods
 - 4.2 Self-Organization map
- 5- Multi-view clustering approaches
 - 5.1 Community detection in multiplex networks
 - 5.2. Collaborative clustering
- 6- Applications
 - 6.1 A multiplex-based clustering ensemble selection approach.
 - 6.2 Visual information retrieval
7. Conclusion & hot research directions