

Computer Science Seminar Fall 2009

Dr. Germain Forestier, University of Strasbourg, France

Tuesday, December 15, 2009

PGH 563

11:00 AM

TITLE: Collaborative Clustering: Introduction, Knowledge, Integration, and Applications

In recent years, a lot of work has focused on the use of multiple clusterings to improve the unsupervised classification process. Indeed, many different algorithms exist and may provide different results from the same dataset. Consequently, it is often difficult to design a single algorithm whose results reflect what users need and expect. To cope with this problem, we propose to use a new approach named collaborative clustering. Collaboration is a process where two or more actors work together to achieve a common goal by sharing knowledge. In collaborative clustering, different clustering methods work together (i.e. collaborate) to reach an agreement on the clustering of a dataset by exchanging information about their clustering. To initiate the collaboration, a pool of clustering results is created using different clustering methods and/or the same method with different parameters. Then, each method modifies its result according to the results proposed by the other ones until all the clustering results became strongly similar. Thus, at the end of this collaboration, the results can be easily unified, for example, through a voting algorithm. Furthermore, if background knowledge are available, we also designed a way to use it within the method to drive the collaboration between the clustering methods leading to an improvement of the final results.

In this presentation, the theoretical basis of collaborative clustering will be first covered. Then, the integration of knowledge in the method will be discussed. Finally different applications of the method on artificial datasets and in the remote sensing field will conclude the talk.

#### Biography:

Germain Forestier received the M.Sc. degree in Computer Science from the University of Strasbourg, France in 2007. He is currently working towards the Ph.D. degree at the Image Sciences, computer Sciences, and Remote Sensing Laboratory (LSIIT), University of Strasbourg, France. His work is funded by a Ph.D. fellowship from the French Ministry for Research and Education. His major research interests are focused on data mining, knowledge discovery and collaborative clustering with applications in remote sensing image analysis. He is the author of several research papers about collaborative clustering and background knowledge intergration.

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