Graph analytics

ECTS : 4

Volume horaire : 24

Description du contenu de l'enseignement :

The objective of this course is to give students an overview of the field of graph analytics. Since graphs form a complex and expressive data type, we need methods for representing graphs in databases, manipulating, querying, analyzing and mining them. Moreover, graph applications are very diverse and need specific algorithms. The course presents new ways to model, store, retrieve, mine and analyze graph-structured data and some examples of applications. Lab sessions are included allowing students to practice graph analytics: modeling a problem into a graph database and performing analytical tasks over the graph in a scalable manner. Program - Graph analytics - Network properties and models - Link Analysis: PageRank and its variants - Community detection - Frameworks for parallel graph analytics - Pregel - a model for parallel-graph computing - GraphX Spark - unifying graph- and data -parallel computing - Machine learning with graphs - Applications: process mining and analysis Practical work: graph analytics with GraphX and Neo4J

Compétence à acquérir :

Modeling a problem into a graph model and performing analytical tasks over the graph in a scalable manner.

Bibliographie, lectures recommandées :

References Ian Robinson, Jim Weber, Emil Eifrem, Graph Databases, Editeur : O'Reilly (4 juin 2013), ISBN-10: 1449356265 Eric Redmond, Jim R. Wilson, Seven Databases in Seven Weeks - A Guide to Modern Databases and the NoSQL Movement, Publisher: Pragmatic Bookshelf Grzegorz Malewicz, Matthew H. Austern, Aart J.C Bik, James C. Dehnert, Ilan Horn, Naty Leiser, and Grzegorz Czajkowski. 2010. Pregel: a system for large-scale graph processing, SIGMOD '10, ACM, New York, NY, USA, 135-146 Xin, Reynold & Crankshaw, Daniel & Dave, Ankur & Gonzalez, Joseph & J. Franklin, Michael & Stoica, Ion. (2014). GraphX: Unifying Data-Parallel and Graph-Parallel Analytics. Michael S. Malak and Robin East, Spark GraphX in Action, Manning, June 2016

Document susceptible de mise à jour - 01/04/2026

Université Paris Dauphine - PSL - Place du Maréchal de Lattre de Tassigny - 75775 PARIS Cedex 16