Management of Data Science and Business Workflows

Titulaire
Dimitrios SACHARIDIS (Coordonnateur)

Mnémonique du cours
INFO-H420

Crédits ECTS
5 crédits

Langue(s) d'enseignement
Anglais

Période du cours
Premier quadrimestre

Campus
Solbosch

Contenu du cours

This course introduces basic concepts for managing workflows in data science applications and business processes. The first part of the course focuses on **business process management** and considers identification, modeling, analysis, simulation, redesign, and mining based on the Business Process Modeling and Notation (BPMN) workflow language. The second part focuses on **data science workflows** and discusses modeling, execution, and optimization, and also introduces various topics on **responsible data science**.

During the course the students have to perform several workflow modeling and analysis assignments.

A high-level overview of the theoretical part of the course:

- Business Process Management
  - Short overview of business processes and the need to manage them.
  - Describing business processes, modeling the control flow, data and resource perspectives.
  - Analysis of business processes, qualitatively and quantitatively.
  - Redesign of business processes.
  - Mining Process Logs.
- Data Science Workflows
  - Short overview of data science workflows.
  - Describing workflows in data science.
  - Analysis and optimization of data science workflows.
  - Data privacy.
  - Explainability of data science workflows.
  - Bias and fairness in data science workflows.

Objectifs (et/ou acquis d'apprentissages spécifiques)

At the end of the course students are able to:

- Explain the business process management cycle.
- Design a formal model of the business process based on an informal description.
- Identify opportunities for optimizing business processes.
- Describe data science workflows.
- Identify the costs associated with executing data science workflows.
- Optimize data science workflows.
- Identify concerns about data privacy and bias.
- Propose techniques to increase the explainability of data science workflows.

Méthodes d'enseignement et activités d'apprentissages

- Theory lectures (24h).
- Exercises; both pen-and-paper and practical exercises (24h).
- Four assignments to be realized in groups (12h).
- Final Exam.

Références, bibliographie et lectures recommandées

Course book (available through Cible+):

- Dumas, La Rosa, Mendling & Reijers: Fundamentals of Business Process Management (second edition), Springer 2018

Support(s) de cours

Université virtuelle

Autres renseignements

Lieu(x) d'enseignement

Solbosch

Contact(s)

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Méthode(s) d'évaluation

Examen écrit et Travail pratique

Examen écrit

Question fermée à Choix Multiple (QCM), Question fermée à Réponses Multiples (QRM) et Question fermée Vrai ou Faux (V/F)

Examen à livre ouvert

Construction de la note (en ce compris, la pondération des notes partielles)

- Four assignments (60%).
- Final Exam (40%).

Langue(s) d'évaluation principale(s)

Anglais

Programmes

Programmes proposant ce cours à l'école polytechnique de Bruxelles

MA-IREM | Master : ingénieur civil électromécanicien | finalité Operation engineering and management/bloc 1 et MA-IRIF | Master : ingénieur civil en informatique | finalité Spécialisée/bloc 1, finalité Spécialisée/bloc 2 et finalité Big Data Management and Analytics (Erasmus Mundus)/bloc 1

Programmes proposant ce cours à la faculté des Sciences

MA-INFO | Master en sciences informatiques | finalité Spécialisée/bloc 2 et MA-SECU | Master en cybersécurité | finalité Erasmus Mundus joint master in Cybersecurity (CYBERUS)/bloc 2