GENERAL SEMINARS – March 2018

Wednesday 07 March 2018: 2 seminars

1st seminar : 10H – 11H

Speaker : Frederic HECHT, Université Pierre et Marie Curie, France.
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Title : Brain imaging with FreeFem++

Abstract : Teaser: Microwave tomography is a novel imaging modality holding great promise for medical applications and in particular for brain stroke diagnosis. We demonstrated on synthetic data the feasibility of a microwave imaging technique for the characterization and monitoring of strokes. Using high performance computing, we are able to obtain a tomographic reconstruction of the brain in less than two minutes.
Our work demonstrates on synthetic data the feasibility of a microwave imaging technique for the characterization of CVAs, and won our research team the Bull-Joseph Fourier Prize in 2015. The numerical framework is based on high-performance computing open-source tools developed by our research team: the HPDDM is an efficient parallel implementation of Domain De-composition Methods (DDM) and is interfaced with the finite element software FreeFem++.
Our work was carried out in collaboration with EMTensor, an Austrian innovative SME dedicated to biomedical imaging and is based on their BRain IMaging Generation1 (BRIMG1) prototype.
In this colloquium, I will present this problem and how to solve it, and I make a short overview of FreeFem++ with some real time tests on classical PDE (Poisson, Navier-Stokes, Elasticy, ...).

2nd seminar : 11H – 12H

Speaker: Sophie DABO, Université de Lille, France. sophie.dabo@univ-lille3.fr

Title: Regression models for spatial data and applications

Abstract : Spatial statistics includes any (statistical) techniques which study phenomenons observed on spatial sets. Such phenomenons appear in a variety of fields: epidemiology, envi-ronmental science, physics, econometrics, image processing and many others. The modelization of spatial data is among the most interesting research subjects in dependent data analysis.
This is motivated by the increasing number of situations coming from different fields of applied sciences for which the data are of spatial nature. This is the case for instance in epidemiology, where data are often spatial or space-time, and so spatial location can acts as a surrogate for risk factors. Complex issues arise in spatial analysis, many of which are neither clearly defined nor completely resolved, but form the basis for current researches.
This is the case of nonparametric data estimation techniques, which incorporate spatial dependency. We are interested here in semi(non)-parametric spatial regression estimation. More precisely, we estimate regression functions where the explanatory and response variables are real-valued or functional random fields. Asymptotic results of the proposed estimator are established. The skills of the methods are illustrated on simulations and real data analysis.

Keywords : Spatial Data - Functional data - Inference - Solar Data- Ozone data- Big Data

10H - 11H

Speaker : Noha El KHATTABI, Université Mohamed V de Rabat, Maroc.
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Title : Modélisation mathématique pour la gestion des déchets ménagers.

Abstract : En raison des dommages environnementaux causés par les sites d'enfouissement, de la rareté des sites situées à proximité des centres urbains, de l'accroissement démographique et de l'opposition croissante du public, il est impératif aujourd'hui dans les pays en voie de développement, de considérer des systèmes de gestion des déchets qui doivent sur le long terme réduire la dépendance aux sites d'enfouissement, contrôler les effets néfastes des émissions de gaz, optimiser la valorisation énergétique et minimiser les coûts.
Nous présentons quelques modèles dynamiques d'optimisation, de simulation et d'analyse des données pour une gestion intégrée et durable des déchets ménagers.

Keywords : gestion des déchets, modèles dynamiques, optimisation, systèmes gris.

1st seminar : 10H – 11H

Speaker : Nadia RAISSI, Université Mohamed V de Rabat, Maroc.
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Title : Dynamic Optimization applied to Fishery Management

Abstract : Bioeconomic is the study of natural resources economic, C. Clark was a pioneer in introducing it in fishery management. In 1970 Colin W. Clark built what was called the Fundamental Fishery Model, a classical optimal control problem, whose analysis leads to a bang-bang control solution and was useful to preserve North Pacific whales. A reach literature follows this work and constitutes what was known as Clark's school.   This occurred thanks to the development of dynamic optimization during the 1980s and early 1990s. Since 2000, according to Moroccan fishery regulation needs, our research team contributed to the task by building and analyzing several models that we aim to summarize some of them in this talk. Step by step the profit maximization objective was forgotten giving way to stabilizability and viability questions, which are of immediate policy relevance.
 Knowing that Moroccan fishery department plan out the operation of European Union fishing from the Moroccan Atlantic Coast, we built a first model that includes variables and parameters related to the presence of a domestic fleet as well as a distant water fishing nation. Its analysis suggests a way to share the harvesting between two fleets. Two optimal scenarios were developed and in each of them a solution was given.

Also, together with Pierre Auger, we focus to study the dynamics of a fish stock, particularly sardines, exploited on several fishing zone; an empirical study permits to validate the hypothesis of logistic natural growth for small pelagic.

Concerned with durability issues of the sector, we also generalized Clark's fundamental fishing model to several situations, such as continuous fishing effort, variable prices, investment policy, protected area. Hence, we focus on the stabilizability questions that are more appropriate to the durability issues.

2nd seminar : 11H – 12H

Speaker : Rock GLITHO, University of Concordia, Canada.
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Title : From the Internet of Things to the Tactile Internet of Things: State of the Art and Research Directions.

Abstract : Internet of Things (IoT) and its most recent flavor (i.e. Tactile Internet of Things - TIoT) refer to things such as wireless sensors, robots, drones and Radio Frequency Identification (RFID) able to interact and cooperate to reach common goals. The applications are numerous. Some examples are agriculture 3.0 (also known as smart farming), environment monitoring, self-driving cars, vehicle platoons, and collaborative remote surgery. This talk summarizes the state-of-the-art in IoT and sketches the research directions. It is illustrated by some of our own work. In the first part, we introduce a sample of pertinent and real life IoT applications. This is followed by a review of the communications protocols specific to IoT (e.g. 6LowPAN, CoAP). The third part is devoted to the IoT architectures with a focus on cloud based – IoT architectures. In the fourth part, the emerging TIoT architectures are presented. We end by a discussion of the challenges and research directions (e.g. IoT for the developing world, ultra reliable and ultra-responsive protocols for TIoT).

Wednesday 28 March 2018:

10H - 11H

Speaker : Colombiano KEDOWIDE, Montreal, Canada.
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Title: Framework for Design of Serious Game for Learning

Abstract : After defining Serious Game as a digital environment for learning and justifying its importance and the benefits of the learning game in general, we are going to focus on the formal away to build the kind of Serious Game. As Serious Games are a relatively new discipline and its development involves different teams, we have to find the right way to build a new approach to develop it.

The great potential of Serious Game, the lack of a common language standard and the lack of standards for designing Serious Game allowed many authors to think that it not possible to realise the Serious Game without a formal design approach. That approach is the framework, which provides a formal language to discuss Serious Game, a methodology to analyse a design, and a process to design a Serious Games for Learning. Serious Game for learning should involve an efficient scenario based on metacognitive strategies. Our target is to figure out how to develop this Serious Games for Learning based on an efficient scenario in order to allow students to control their learning in the way that he can identify what he learns and how he learns it.

The Framework for design of Serious Games for Learning is based on the new approach which is called here Serious Games for learning engineering, in combining some components that derive from software computing, instructional design and gaming engineering in order to create Serious Game for Learning. The most important thing in learning process is self-assessment in order to measure the degree of learning. Debriefing that is a metacognitive strategy that allows doing it should be part of the Framework.

Keywords: Framework, Serious Games, Learning, metacognition, debriefing.

<p style="text-align:center">2nd Seminar: 11H – 12H</p>

Speaker: Pélagie HOUNGUE, IMSP, Benin. hepy1900@gmail.com

Title: Towards Semantic Web approach for Information retrieval.

Abstract : This presentation aims to allow you understanding what semantic Web is, what are its strengths and functionalities. We will then focus on its multilayer architecture and through it, discuss on the languages used by the semantic Web and ontologies that constitute one of the basics of Web 3.0. We will conclude by briefly exploring the Emergsem approach which exploit Semantic Indexing for Images in order to setup an emergent recommendation system.