

Journées de printemps de la SAGIP 2022

Bidart, 23-25 mai 2022

(<https://sagip2022.estia.fr/>)



CT INgénierie d'Entreprise : Architectures, Méthodes et Modèles
(<http://www.ct-ine.fr/>)

Session 1	Mardi 24 mai 2022 de 11h00 - 12h30 (Salle Réunion 32)
	Conférencier invité par le CT INE
11h00 à 11h40	Titre : Epistémologie et éthique des IA : recherche et création de cours et de formations Auteurs : Jean-Pierre LLORED Institution : Centrale-Supélec / Ecole Centrale Casablanca
11h40 à 12h10	Titre : Personalized Risk Prediction of Lifestyle-Related Diseases Based on Health Medical Data Auteurs : Lijuan REN (PhD 2), Tao WANG, Aïcha SEKHARI, Haiqing ZHANG, Abdelaziz BOURAS Institution : Université Lumière Lyon 2, Laboratoire DISP
12h10 à 12h30	Titre : Intelligent formal analysis of heterogeneous data for semantic web Auteurs : Mariano Julian FERREIRONE (PhD 1), Mario LEZOCHÉ, Hervé PANETTO Institution : Université de Lorraine, Laboratoire CRAN

Session 2	Mercredi 25 mai 2022 de 09h00 - 10h30 (Salle Réunion 1 ESTIA 2)
09h00 à 09h20	Titre : Formal methods for knowledge extraction and reuse from heterogeneous sources: applications to the semantic interoperability of distributed architectures. Auteurs : Nicolas Emanuel LEUTWYLER (PhD 1 - CIFRE), Mario LEZOCHÉ, Hervé PANETTO Institution : Université de Lorraine, Laboratoire CRAN / Syndicat National Moniteur de Ski de France (SNMSF)
09h20 à 09h40	Titre : Proactive methods for zero-defects manufacturing in laser cutting and welding Auteurs : Jean-Rémi PIAT (PhD 1 - CIFRE), Mohand Lounes BENTAHA, Baudouin DAFFLON, Nejib Moalla Institution : Université Lumière Lyon 2, Laboratoire DISP / FAYOLLE SAS
09h40 à 10h30	Titre : Activités du CT INE (http://www.ct-ine.fr/) <ul style="list-style-type: none">• Evolution des thématiques du CT• Relance de la journée nationale du CT.• Evolution dans l'équipe d'animation du CT : Mario LEZOCHÉ pour remplacer Nejib MOALLA

Résumés des Présentations de la 1ère session

Résumé de la présentation 1 - Jean-Pierre LLORED

Dans le cadre de cette communication, je donnerai une vision globale de mes travaux de recherche en épistémologie et éthique, en particulier dans le domaine des sciences et des NBIC, ainsi que les cours et les formations que j'ai pu mettre en place dans ces domaines en écoles d'ingénieurs, en master, en licence et en Bachelor afin de donner aux étudiants des bases pour penser, ensemble, sciences, techniques, sociétés et environnement.

Jean-Pierre LLORED : Enseignant-chercheur-HDR en sciences humaines et sociales (associate professor). Ecole Centrale Casablanca, Maroc ; rattaché au département sciences humaines et sociales, Ecole Centrale Supélec, France ; IDHES-Ecole Normale Supérieure Paris-Saclay, France. Deputy editor de Foundations of chemistry (Springer). Successivement, chimiste, philosophe, et historien des sciences et des techniques de formation. Adresse électronique : Jean-Pierre.LLORED@centrale-casablanca.ma.

Lien vers le CV de Jean-Pierre LLORED (<https://bit.ly/37NL9Wm>)

Résumé de la présentation 2 – Lijuan REN

Lifestyle-related diseases (LRDs) refer to diseases whose pathophysiology is significantly affected by lifestyle factors [1], Changing these etiological factors can significantly improve disease prevention and treatment [2-5]. As countries become more industrialized and wealthier, the rapid growth of such diseases is placing enormous pressure on population health. The future prospects for such diseases are prevention rather than just treatment [6]. Personalized risk prediction provides a new perspective to assist doctor's work with disease prevention. As the characteristics of health medical data in term of large-scale, incompleteness, imbalance and mixed-type, traditional statistical methods are not suitable to provide personalized prevention or treatment care program. AI-based algorithms with its promise to efficiently support the data analytics, can contribute to extract hidden but useful knowledge (i.e., unknown correlations between diseases and features, link between a disease with its complication) from massive medical data. In this context, two research issues are raised. Firstly, the incompleteness caused by missing values in medical data may decrease identifying ability of AI-based algorithms for disease risks. Secondly, single AI-based algorithms (i.e., C4.5[7]) can't perform well when faced with unreliability lifestyle data collected from questionnaires. Therefore, we first proposed an imputation method to replace missing values by plausible values for incomplete medical data with the characteristics of imbalance and mixed type. Experimental results show that our method outperforms on imputation accuracy, and it can enhance the identifying ability of AI-based algorithm on evaluating disease risks comparing 2 deletion methods (i.e., LD, PD) [8] and several imputation methods (i.e., KNNI [9], RFI [10], DMI [11], [wNNSel] _mix [12]). Currently, we develop a personalized risk prediction model using the stacking-based ensemble framework [13] which can combine multiple heterogeneous AI-based models. The stacking-based ensemble framework can improve the robustness of model comparing single AI-based model when encountering unreliability lifestyle data from questionnaires. In the future work, we will construct a robust AI system for personalized risk prediction of lifestyle-related diseases which can support doctor's work on disease prevention.

Résumé de la présentation 3 – Mariano Julian FERREIRONE

The author will present a data driven analysis approach applied to a touristic case study. The aim of this research project is twofold: on the one hand, to model data from heterogeneous sources and, on the other hand, to study the problems posed by model-driven engineering in cooperative systems. Involving cooperation concerning "systems of actors" willing to interoperate. The semantic tools used will be the knowledge graphs and their specialisations.

Résumés des Présentations de la 2^{ème} session

Résumé de la présentation 1 – Nicolas Emanuel LEUTWYLER

The author will present a multi relational data mining subject applied to a touristic case study. This work focuses on the creation of mathematical models and the implementation of intelligent sensors, Cyber Physical Systems (CPS) to enrich the layer of data coming from the field. One of the most relevant scientific challenges is the lack of formalisation (in other mathematical terms) of system models and the resulting information systems, as well as the definition of the semantics of the concepts and relationships they apply, to ensure their common understanding and to facilitate their interoperability by minimising semantic losses.

Résumé de la présentation 2 – Jean-Rémi PIAT

Laser cutting and welding (LCW) are complex energy based non-contact machining process capable of cutting and welding a multitude of seams on materials with high productivity, high accuracy and high products quality. The physical reaction during LCW and the variety of manufactured products mean that zero-defect manufacturing is challenging in LCW. Actually, defects are difficult to detect because of the need of destructive testing and their anticipation and optimal process adjustment are difficult to reach due to the complexity of LCW process. New solutions are therefore needed to support quality defect detection, quality control and process optimization (get the right product on the first try) in LCW machining. For the last decade, studies were carried out to improve defect detection, defects classification, parameters optimization and intelligent scheduling. However, the developed solutions are dedicated to specific situations and need to be adapted to industrial context and environment, in terms of data availability, heterogeneous computer protocols, technological and organizational maturity, and company requirements. This research work therefore focuses on the development of a decision support system to solve the different issues presented with adequate means of data collection, classification and estimation models, optimization algorithms, interoperable IT systems and agile management.