10H à 11H: "Identifiability of Affine Linear Parameter-Varying state-space models"- Ziad Alkhoury (LIAS, Université Poitiers)
Résumé: Whatever the model structure is (linear time-invariant, linear parameter-varying, nonlinear), the identifiability of a parametrized model should be studied before designing and performing any identification experiment. The motivation behind this is to determine whether there is, or not, a unique tuple of model parameters, which can be found from the input–output data using some user-defined identification method. In general, the identifiability of Affine Linear Parameter-Varying state-space (ALPV-SS) model parameterizations does not guarantee the identifiability of the LTI parameterizations composed of frozen LTI models. A new sufficient and necessary condition is presented in order to guarantee the structural identifiability for ALPV-SS parameterizations. The identifiability of this class of parameterizations is related to the lack of state–space isomorphisms between any two models corresponding to different parameter values.

11H à 12H: "Peer-Assisted Individual Assessment in a Multi-Agent System"- Michel Kieffer (L2S, Supelec)
Résumé: Consider a multi-agent system where agents perform a given task with different levels of ability. Agents are initially not aware of how well they perform in comparison with their peers, and are willing to self-assess. This scenario is relevant, e.g., in wireless sensor networks, or in crowdsensing applications, where devices with embedded sensing capabilities collaboratively collect data to characterize the environment: the global performance is very sensitive to the measurement accuracy, and agents providing outliers should restrain to participate. This presentation describes a distributed algorithm enabling each agent to self-assess its own ability. The algorithm tracks the outcomes of a local comparison test performed by pairs of agents when they randomly meet, and able to gauge their relative level of ability. The dynamics of the proportions of agents with similar assessments are described using continuous-time state equations. The existence of an equilibrium is shown. Closed-form expressions for the various proportions of agents with similar assessments are provided at equilibrium. In simulations, a community of agents equipped with sensors, and trying to determine the performance of their equipment is considered. Simulation results show a good fitting with theoretical predictions.

14H à 15H: " Granger causality and graph structure of state space representations"- Monika Jozsa (IMT-Lille-Douai, University of Groningen)
Résumé: The identification of the connectivity structure between subsystems of a complex system occurs in several applications. It is of interest then to study the identifiability of this connectivity structure based on the observed output. Considering the outputs of the subsystems as components of a full output process we relate the causal relations among the components to the connectivity structure between the subsystems. Using the term of Granger causality, we define causality structure of the output process of an LTI state space system. For this, we show that the causality structure of the output process guaranties the existence of a state space representation with a certain topology of the connectivity structure of the subsystems. One of the applications of the results is to model the brain activity and the causal structure between different regions of the brain. We present an example of this application to illustrate the computational part of the results.

15H à 16H: "Identification de systèmes linéaires à commutations en présence de bruit borné"- Abdelhak Goudjil (Université Caen)
Résumé: Dans cette présentation, nous considérons le problème d'identification de systèmes linéaires à commutations en présence de bruit borné. La résolution de ce problème d'identification nécessite l'association de chaque donnée au sous-système le plus approprié et l'estimation de tous les vecteurs de paramètres des sous-systèmes. Nous présentons un algorithme basé sur une méthode d'identification de type OBE . Ce type d'algorithme est approprié pour l'identification de systèmes en temps réel avec bruit borné.