

## ABSTRACTS

**Hang LI**, Director of the Noah's Ark Lab of Huawei Technologies  
**Building Better Connected World with Artificial Intelligence Technologies**

We envision that with artificial intelligence technologies the telecommunication, enterprise, and consumer industries, in which Huawei has its main business, will enter a completely new horizon; specifically, all the products and services will be revolutionized to become more intelligent. Huawei is indeed pushing the frontier of research and development of technologies in those fields and has accomplished significant achievements. In this talk, I will introduce some of the best practices as well as the technology breakthroughs made in Huawei, with regard to building better telecommunication networks, better enterprise management, and better mobile devices. Specifically, I will describe the accomplishments made at research projects of Huawei Noah's Ark Lab. Finally, I will summarize the challenges and important research directions in artificial intelligence, for which more research, particularly fundamental research, is needed.

**Nikos PARAGIOS**, Department of Mathematics, Ecole CentraleSupélec  
**Data Mining Through Higher Order Probabilistic Graphical Models**

In this talk we present a generic higher order graph-based computational model for automatically inferring and learning data interpretations in diverse settings. In particular we discuss the interest and theoretical strengths of such representations, propose efficient inference algorithms for low and higher-order rank models, as well as efficient learning methods towards predictive representations that could be learned efficiently from few examples. The interest of such computational solutions is demonstrated in various challenging domains such as computer vision (graph-matching, image-parsing), computer-aided image-based diagnosis (tumor modeling from partial/incomplete annotations, multi-modal fusion, probabilistic digital anatomy) and computational biology (protein prediction).

**Jean PONCE**, Département d'Informatique, Ecole Normale Supérieure  
**Weakly Supervised Structure Discovery in Images and Videos**

This talk addresses the problem of understanding the visual content of images and videos using weak forms of supervision, such as the fact that multiple images contain instances of the same objects, or the textual information available in television or film scripts. I will discuss several instances of this problem, including image cosegmentation, the joint localization and identification of movie characters and their actions, and the assignment of action labels to video frames using temporal ordering constraints. I will present the underlying discriminative clustering model, appropriate relaxations of the combinatorial optimization problems associated with learning its parameters, and efficient algorithms for solving the corresponding convex optimization problems. I will also present experimental results on standard image benchmarks and feature-length films. I will conclude with a brief discussion of our recent work on fully unsupervised object discovery in photographs and videos.

**Gilles WAINRIB**, Owkin /ENS  
**Transfer Learning and Collaborative AI**

Everyday, new deep learning algorithms are trained to solve specific tasks, such as medical images classification. What if we could share and connect those algorithms and create the conditions for a cross-fertilization between these powerful artificial intelligence systems? In this talk, we will discuss the fundamental role of transfer learning to foster the emergence of collaborative artificial intelligence and show how it can bring the power of big-data-trained deep learning algorithms into the world of medical not-so-big data. As an illustration, we will present a new platform for medical image recognition based on deep transfer learning and collaborative AI.