Subject: Real-time recommendation models design and development

1. **Objective** : How to mutualize machine learning models to develop Real-time recommendation systems.

2. **Duration**: 1/2 day

3. **Tutorial description**

This tutorial is intended to provide a global overview of specialized machine learning models in order to design and develop real-time recommendations engines.

During the tutorial, an advance big data platform (Hupi platform) will be introduced. This platform include a rich set of components (i.e. spark 2.1 framework and the scala 2.11 language, etc.) intended to ensure a complete data processing cycle while respecting real time constraints.

During the tutorial, the following phases will be illustrated:
- The collection of any data set, of any size, from any sources, including data flows
- The storage of high volume of data on a cluster environment guaranteeing high performance
- The distributed computation for real time analysis by machine learning algorithms to generate well-adapted recommendations
- The visualization functionalities allowing to check the results of the recommendations and to track their performance
- The automation module to push the results to external systems in real time.

Based on these components several recommendation models will be designed and implemented, including several styles such as ALS, item-item, user-item, etc. An event-oriented approach will be followed based on specific features in order to implement real-time reactive services.

Moreover, secured access to Restful APIs will be studied in order to provide real-time recommendation systems for interactive environments, such as e-commerce systems.

4. **Motivation and interest for the SAC community**

This tutorial is intended to illustrate the big picture of cognitive-oriented systems, and in particular how real-time predictive and prescriptive systems can be designed and developed. Our tutorial audience targets researchers, master and PhD students and software architectures. For these reasons, we think this tutorial will attractive and relevant to the SAC ACM 2018 participants.

5. **BIO and related projects**

Vincent Moreno holds a Diploma and Master degree in Informatics and a MBA in Enterprise Management. He has worked over 15 years in different companies from the public, energy, financial, and industry sectors, playing different roles as a data architect, project manager, IT consultant, finance IT architect, or IT executive. He has coordinated several research and innovation activities in various research projects (see below).

Romain Roquefere holds a Diploma in Electric Engineering and a Master degree in Business administration. He has worked in different IT and BD companies and consulting firms. He has experience as an IT engineer, data analyser, business development and strategic planning, project manager, responsible for strategic planning activities, ad IT consultant, among others.

Relevant research and innovation projects:

- Luma project (http://fr.luma.es)
The IoBikes anti-theft system, based on BLE(Bluetooth low energy) technology, integrates a light and easy to handle data transmitter. This small device can be easily applied to other businesses in tag format: other two-wheeled vehicles, baggage. IoBikes will develop a big-data platform and premium services which will give bike mobility data to cities. Some of the data could be used for free for the community, which is fully aligned with the "open data strategy" in Europe.

- The TORUS project (http://cloud-torus.com/)
The TORUS project (Toward an Open Resources Upon Services: Cloud of environmental data) aims to make operational techniques of cloud computing (CC) in the disciplinary field of environmental science and massive databases (Big Data) for future training and projects in partner countries.