Research Grants for PhD students from the China Scholarship Council

Information Form (please read the guidelines carefully on the website www-csc.utt.fr)

Supervisor's name: Pauchet
Given names: Alexandre

Status (prof., assistant prof., …): Associate professor HDR

Laboratory: LITIS
Website address: http://www.litislab.fr/

Institution: INSA Rouen Normandie
Website address: http://www.insa-rouen.fr/

Scientific competence of the supervisor:

A. Pauchet is associate professor at INSA de Rouen Normandie since 2007. He has defended his Habilitation to conduct researches (HDR) in 2014. Among various PhD supervisions and fields of research, he co-supervised the PhD of Rick Moritz titled “Routine Activity Extraction from Local Alignments in Mobile Phone Context Data” and the PhD of Zacharie Alès on extraction and clustering of interaction patterns.

Keywords: Human-Computer Interaction, Interaction Pattern Extraction and datamining.

Two major publications in the field proposed for the PhD:


Website address of the personal page: http://asi.insa-rouen.fr/enseignants/~apauchet/

Supervisor's email: alexandre.pauchet@insa-rouen.fr

Description of the research work proposed for a PhD

Title: Mining numerical traces to extract recurrent activities. Application to mobile data analysis.

Subject:

Physical and logical sensors provide a huge amount of data that describes users’ activity and contextual information. Assuming that context data is a strong indicator of user habits, mining numerical traces, i.e. context data sequences, to extract repetitive patterns should enable to model user activity. Mobile context can be represented by sequences of n-tuples, where n is the number of context data sources from sensors. Therefore, modeling a user activity can be decomposed in two steps: 1) extraction of interaction patterns from numerical traces, and 2) clustering of interaction patterns. The huge volume of data to process and its heterogeneity as well as the temporal scale are challenging aspects of the subject. Examples of the expected contributions include: to model the problem of regularity extraction from sequences of n-tuples, to propose an efficient interaction pattern extraction method, to design a clustering method of interaction patterns based on approximation algorithms and/or matheuristics and to exploit the extracted interaction patterns in a mobile application. Mobile data previously collected will be exploited for analysis during the PhD.

Keywords:

Mobile phone user modelling, numerical traces, interaction pattern extraction, pattern clustering, matheuristics, approximation algorithms.

Expected collaborations:

The PhD will be supervised by A. Pauchet, A. Knippel (LMI) and M. Mainguenaud (LITIS). A. Knippel is specialized in operational research while M. Mainguenaud is expert in geographic databases. A strong collaboration between LITIS and LMI will therefore be effective.

Background required from the applicant:

The candidate must have a MSc in computer science, operations research or applied mathematics. In particular, expertise and development experiences in the domains of data-mining, machine learning or operational research are required. Some knowledge in artificial intelligence, mobile computing, (geographic) database is also welcome.

Existence of a PDF file detailing the proposal ("yes" or "no") : yes
(see guidelines on the website www-csc.utt.fr)