**Scientific competence:**
After a Master in engineering and a Master in photonics and image processing from the University L. Pasteur Strasbourg I (France), F. Gechter received the Ph.D. in Computer Science from University H. Poincare Nancy I (France) in 2003. In 2004, he became Associate Professor in Computer Science at UTBM and IRTES-SET. He works particularly on Reactive Multi-Agent models applied to problem solving, to decision processes and to data fusion. In 2012, he became also associate researcher to the Fuel Cell Laboratory (CNRS federation of laboratories). In 2013, Franck Gechter passed his Habilitation to Lead Research Work (HDR) at the Franche Comté University (UFC).

Two major publications in the field proposed for the PhD:


**Description of the research work proposed for a PhD**

**Title:** Traffic jam reduction based on vehicle platoons and intelligent crossroads interactions

**Subject:**
Circulating personal cars reach the 15 millions per day in Paris, including its suburban area. Moreover, each individual vehicle is occupied in average by less than 1.3 person. This situation leads naturally to traffic jams, pollution, time loss, stress... and is not specific to Paris since all big urban areas around the world are also confronted with such a problem. Several scientific approaches can be considered so as to partially solve this problem. Among them, one can cite those based on the “platoon” function, which allows vehicles to follow each other automatically without any material coupling. Another possible approach consists in developing smart crossroads aimed at improving the efficiency of the classical traffic light of stop sign intersection. The purpose of this PhD thesis is to study, develop and test new approaches so as to tackle with the traffic jam based on platoon function and on crossroads considered as smart hubs where trains of vehicles can cross and exchange vehicles with efficiency. The subject of this PhD has to take into consideration several levels of the problem from the local point of view, dealing with the perception and communication issues between vehicles (V2V) and with the infrastructure (V2I), to the system point of view where one want to optimize the travel time of vehicles. For each level, the candidate will have to define measurements so as to evaluate with pertinence his proposals. The candidate will benefit from the experience of IRTES-SeT laboratory.

**Keywords:** Platoon control, smart crossroads, traffic jam reduction

**Expected collaborations:**
Institut Pascal, Labex IMOBS3, ISAT Nevers

**Background required from the applicant:**
Good skills in Computer Science and specifically in Object Oriented Programming are required (JAVA, C++,...). A good knowledge in Artificial Intelligence and in computer vision will be appreciated.

**Existence of a PDF file detailing the proposal (“yes” or “no”):** Yes

(see guidelines on the website www-csc.utt.fr)