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 :	Brunie	Given names :	Lionel
Status (prof., assistant prof., …) :	Prof.		
Laboratory :	LIRIS(Laboratoire d'InforRmatique en Image et en Systemes d'information	Website address :	https://liris.cnrs.fr/en
Institution :	INSA Lyon	Website address :	https://www.insa-lyon.fr/

Scientific competence of the supervisor:

Distributed systems
Privacy preserving systems and Trust
BlockChain protocols

Two major publications in the field proposed for the PhD :

1. O.Hasan, L. Brunie & E. Bertino (2023). « Privacy-Preserving Reputation Systems Based on Blockchain and Other Cryptographic Building Blocks: A Survey ». ACM Computing Surveys, vol. 55, n°2, pp. 1-37
2. W. Uriawan, O. Hasan, Y. Badr & L. Brunie (2022). « LAPS: Computing Loan Default Risk from User Activity, Profile, and Recommendations ». The Fourth IEEE International Conference (BCCA 2022)

Website address of the personal page : https://perso.liris.cnrs.fr/lionel.brunie/

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Description of the research work proposed for a PhD **Topic # (see list) :** 1.11

Title : Leveraging efficient Blockchain for a trustworthy data sharing in V2x

Subject :

Currently, the automotive industry is undergoing a very significant technological transformation by a shift from traditional combustion engines to electric engines, equipped with complex sensor networks and able to interact with their environment, as well as with services and entities operating on the Internet (e.g., road infrastructure). This has led to the development of the Internet of Everything (e.g., V2X). In this context, an emerging spectrum of applications will be developed among which those requiring local data sharing and others that require more storage and computing resources, to be aggregated and analyzed by powerful servers (clouds) to be able to produce accurate decisions or recommendations that could be transferred back to vehicles. In this PhD thesis we are interested in real-time applications such as accident avoidance that require not only a huge data gathering and a fast response time but also a non tampered and reliable data. Blockchain has recently emerged as a prominent candidate infrastructure for implementing accountability and trust procedures, primarily because of its intrinsic properties of immutability, integrity, availability. However, current BlockChain solutions are not suitable to the real-time aspects of emerging V2X applications as BC consensus protocols are time and space consuming. The objectives of this PhD thesis is to propose a BC architecture and protocols that tackle these issues.

Keywords :

V2X environments, real-time application, trusted data sharing, Blockchain

Expected collaborations :

University of Passau in Germany

Background required from the applicant :

Distributed Systems – architectures and protocols

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