

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 : Benjamin NGUYEN Given names :

Status (prof., assistant prof., ...) : Professeur des Universités (Full Professor)

Laboratory : Laboratoire d'Informatique Fondamentale d'Orléans (LIFO) Website address : <https://www.univ-orleans.fr/lifo/>

Institution : INSA Centre Val de Loire Website address : <http://www.insa-centrevalde Loire.fr/fr/>

Scientific competence of the supervisor:

The supervisor is an expert on Privacy & Security in Information Management Systems and Applications. More specifically, he studies anonymization techniques ; models to represent, quantify and enforce limited data collection ; methods to enforce existing privacy models using secure hardware devices ; design and implementation of large scale privacy-by-design personal information management applications (in general interdisciplinary research).

Two major publications in the field proposed for the PhD :

1. Nicolas AnCIAUX, Danae Boutara, Benjamin Nguyen, Michalis Vazirgiannis: Limiting Data Exposure in Multi-Label Classification Processes. *Fundam. Inform.* 137(2): 219-236 (2015)
2. Nicolas AnCIAUX, Benjamin Nguyen, Michalis Vazirgiannis: Limiting data collection in application forms: A real-case application of a founding privacy principle. *PST* 2012: 59-66

Website address of the personal page : <https://www.benjamin-nguyen.fr/home/>

Supervisor's email : benjamin.nguyen@insa-cvl.fr

Description of the research work proposed for a PhD

Topic # (see list) : 1 - 18

Title : Dynamic Epistemic Logics for Privacy

Subject :

Topic. Online services such as e-admin, e-banking, etc. use complex decision processes (fed by forms) to calibrate the offer (benefits) they make to each applicant. These decision processes require many personal data items, which are subsequently processed and stored. Removing from users' application forms the personal data items, which are not strictly useful for its subsequent evaluation by a service provider, is imposed by privacy laws enacted worldwide, and is useful for both service providers and users.

Goal. Modal logics have a wide range of applications: epistemic logics have been developed to model knowledge, beliefs and reasoning. Here, we aim at formalizing and implementing algorithms that reduce the data collected to the strict minimum given a decision process. To formalize this problem, one needs to formalize knowledge and reasoning based on deterministic and probabilistic knowledge, and to understand what is the real exposure, in terms of privacy, of the applicant during this procedure. Possible research directions. Depending on the main interests of the PhD student, the thesis could focus more on the applied part of the project with a large part around the implementation of the results and the development of limited data collection algorithms, or it could focus more on the theoretical aspects in probabilistic epistemic logics (these are the logics used to represent probabilistic knowledge and reasoning).

Keywords :

privacy, limited data collection, logic, formalization, (probabilistic) epistemic logic

Expected collaborations :

Associate Professor Alessandra Palmigiano (Applied Logic group, Delft University of Technology, the Netherlands) and Dr. Giuseppe Greco (Utrecht University, the Netherlands) : experts in epistemic logics.
Dr. Nicolas AnCIAUX (Researcher in the team PETRUS at INRIA, France) and Associate Professor Guillaume Scerry (Université de Versailles Saint-Quentin, France).

Background required from the applicant :

Master degree either in Theoretical Computer Science or in Pure Mathematics.

The candidate should have some experience in logic (be very comfortable with propositional logic and know either about first order logic or about modal logic). The candidate should at least have basic knowledge in programming, but more experience would be welcomed. The candidate should want to do a PhD thesis in logic.

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

Yes