Mohamed Maouche

PhD Candidate – Engineer – Data Science – Privacy

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💼 WORK EXPERIENCE

OCTOBER 2016 – SEPTEMBER 2019
INSA-Lyon LIRIS Lab, France.
PhD Student

In the fields of Data Science, Security and Privacy. Working on Location Privacy. And more precisely on re-identification attacks and obfuscation techniques

OCTOBER 2016 – AUGUST 2019
INSA-Lyon, France
Trainer

Give courses on computer science in the first cycle department (Dept PC) and in the computer science department of INSA-Lyon (Dept. IF).

OCTOBER 2016 – PRESENT
INSA-Lyon LIRIS Lab, France
Reviewer

Review for ACM IMWUT 2019 journal and sub-reviewer for conferences: SRDS 18, Euro-Par 18, ICDCS 18, Shadow PC Eurosys 18.

JANUARY 2016 – JUNE 2016
UTC - Heudyasic Lab, France
Research Intern

In the field of Optimization in Operations research. Working on the Vehicle Routing Problem (VRP).

JUNE 2014 – AUGUST 2014
CDTA of Algiers
Intern

Study of a formal method proposed by a research team in the University of Queensland (Australia) which purpose was to transform a BPMN model into a Petri network.

👥 RESPONSIBILITIES

Co-webmaster and member of the local organization committee of IEEE SRDS 2019
www.srds-conference.org.

Server administrator of DRIM Reasearch Team (2018-2019).

Manager of DRIM's twitter account (2017-2019).

🎓 EDUCATION

2011 –2016	**Engineer/Master degree In Computer Science**
	Ecole Nationale Superieure d'Informatique - ESI, Algiers
2008 – 2011	**Baccalaureat in Mathematics**
	HIGH SCHOOL DIPLOMA
	Bouamama High school, Algiers

📕 TRAINER

COMPUTER SCIENCE	Algorithmic, OOP
OPERATING SYSTEMS	C, Scheduling, Concurrency, Memory Management, File System
WEB DATA	XML, XPath, MongoDB
SEMANTIC WEB	RDF, SPARQL
HUMAN COMPUTER INTERACTION	Android Project

◎ SUPERVISIONS

Besma Khalfoun – Master Student from ESI

Jugurta Ikherbane – Master Student from ESI

Dorian Lefeuvre – 3rd year Ph.D. Track Student project from INSA-Lyon

🗺 LANGUAGES

FRENCH	Native speaker
ARABIC	Native speaker
ENGLISH	Oral: Good – Written: Good

</> PROGRAMMING SKILLS

| GOOD LEVEL | Python, scikit-learn, scipy, keras, Java, Scala, C++, C, git, Linux, MongoDB, XML |
| INTERMEDIATE | HTML, XSL, JavaScript, LaTeX, R, MySQL, IOS (Cisco), UML, Android |

Q RESEARCH INTERESTS AND CONTRIBUTIONS

My main interest during my Ph.D. Thesis is the protection of users privacy in location-based services. With the advent of mobile devices, an increasing amount of mobility data is gathered by the service provider. In addition to opening a new wide variety of applications and opportunities, it raises many privacy issues. Indeed, numerous sensitive information about the users can be inferred from a user mobility trace. Such as Home location, Workplace, Religious beliefs, etc. To prevent this information leakage, many protection mechanisms have been proposed by the scientific community. Nevertheless, a lot of research work is needed in order to design a protection mechanism that keeps the utility of data while preserving privacy. In this context, I'm focusing on the threat of user re-identification and searching method to hide efficiently a user while preserving the functionality of the service. My main contributions are:

- Finding vulnerabilities in current dataset and applications with the design of strong re-identification attacks [2,4,7,10,11].

- Designing protection mechanisms that considers different type of attacks [1,5,9,12].

- Studying the Privacy/Utility trade-off on real mobility data and constraining protection mechanisms with data utility preservation [1,3,5,8,9,12].

- Produce replicable experiments with open-source code publication.

This research makes use of modern machine learning techniques and information theory. For the future, I would like to explore the privacy consequences of the participation in machine learning models, especially in the collaborative distributed models. I also want to explore the use of generative models (e.g., GANs) for the protection of private data (e.g., mobility data).

📰 PUBLICATIONS SUMMARY

International Journals (1)

[1] Mohamed Maouche, Sonia Ben Mokhtar, Sara Bouchenak: HMC: Robust Privacy Protection of Mobility Data against Multiple Re-Identification Attacks. IMWUT 2(3): 124:1-124:25 (2018) / Ubicomp 2018 `https://hal.archives-ouvertes.fr/hal-01954041`

International Conferences (2)

[2] Mohamed Maouche, Sonia Ben Mokhtar, Sara Bouchenak: AP-Attack: A Novel User Re-identification Attack On Mobility Datasets. MobiQuitous 2017: 48-57 `https://hal.archives-ouvertes.fr/hal-01785155`

[3] Vincent Primault, Mohamed Maouche, Antoine Boutet, Sonia Ben Mokhtar, Sara Bouchenak, Lionel Brunie: ACCIO: How to Make Location Privacy Experimentation Open and Easy. ICDCS 2018: 896-906 `https://hal.archives-ouvertes.fr/hal-01784557`

French National Conferences (5)

Those conferences have peer reviews but no proceedings.

[4] Mohamed Maouche, Sonia Ben Mokhtar, Sara Bouchenak. Attaques de ré-identification des utilisateurs à partir de leurs traces de mobilité. Compas 2017

[5] Mohamed Maouche, Sonia Ben Mokhtar, Sara Bouchenak. HMC : Préservation de la vie privée des utilisateurs sur les données de mobilité par la protection contre les attaques de ré-identification. Compas 2018

[6] Jugurta Ikherbane, Mohamed Maouche, Sonia Ben Mokhtar, Sara Bouchenak. Calcul multipartite sécurisé basé sur un environnement d'exécution sécurisée. Compas 2018

[7] Mohamed Maouche, Sonia Ben Mokhtar, Sara Bouchenak. SFERA: Assessing Location Privacy with Re-Identification Attacks. APVP 2017

[8] Vincent Primault, Mohamed Maouche, Antoine Boutet, Sonia Ben Mokhtar, Sara Bouchenak, Lionel Brunie. How to Make Privacy Experimentation Open and Easy?. APVP 2018

[9] Besma Khalfoun, Mohamed Maouche, Sonia Ben Mokhtar, Sara Bouchenak: MooD: MObility Data Privacy as Orphan Disease. Compas 2019

📰 ONGOING SUBMISSIONS

[10] Mohamed Maouche, Sonia Ben Mokhtar, Sara Bouchenak: ILL-Attack: Mobile User Re-identification Using Extremely Randomized Trees. IMWUT/Ubicomp 2020

[11] Mohamed Maouche, Sonia Ben Mokhtar, Sara Bouchenak: User Re-identification Attacks On Mobility Data: Towards a Multi-Policy Approach. IEEE TDSC.

[12] Besma Khalfoun, Mohamed Maouche, Sonia Ben Mokhtar, Sara Bouchenak: MooD: MObility Data Privacy as Orphan Disease. Middleware 2019

🖹 SOFTWARE DEVELOPMENT

[13] SFERA: A toolkit to experiment on re-identification attacks on mobility traces `https://github.com/mmaouche-insa/SFERA`

[14] HMC: A toolkit to test the Location Privacy Protection Mechanism HMC (Heat-Map Confusion) `https://github.com/mmaouche-insa/HMC`

[15] Participation in Accio (main contributer is Vincent Primault): A scientific workflow management tool, used to study location privacy `https://privamov.github.io/accio/`

◀ COMMUNICATIONS

Event	Date	Location	Title
Ubicomp'18	October 10, 2018	Singapore	HMC: Privacy Protection of Mobility Data Against Multiple Re-Identification Attacks
Compas'18	July 5, 2018	Toulouse, France	HMC: Privacy Protection of Mobility Data Against Multiple Re-Identification Attacks Using Macro-Mobility
IRIXYS Workshop	June 25, 2018	Gargnano, Italy	HMC: Privacy Protection of Mobility Data Against Multiple Re-Identification Attacks Using Macro-Mobility
Workshop Security Franco-Americain	December 11, 2017	Lyon, France	Protecting Users Against Re-identification Attacks Using Heat-Map Alteration
IRIXYS Workshop	November 30, 2017	Hendaye, France	Protecting Users Against Re-identification Attacks Using Heat-Map Alteration
MobiQuitous'17	November 10, 2017	Melbourne, Australia	A novel AP-Attack Users Re-Identification Attack on Mobility Datasets
IRIXYS Summer School	July 21, 2017	Chiemsee, Germany	SFERA: Assessing Location Privacy with Re-identification Attacks
Compas'17	June 28, 2017	Sophia Antipolis, France	SFERA: Assessing Location Privacy with Re-Identification Attacks
APVP'17	June 19, 2017	Autrans, France	SFERA: Assessing Location Privacy with Re-identification Attacks
LIRIS Security Workshop	May 30, 2017	Lyon, France	Assessing Location Privacy with Re-identification Attacks
GDR RSD ASF Winter School	March 9, 2017	Pleynet, France	Quantifying Location Privacy Using Re-identification Attacks
IRIXYS Workshop	November 1, 2016	Lyon, France	Quantifying Location Privacy Using Re-identification Attacks