

EDUCATION

Columbia University Ph.D. in Computer Science — Advisor: Pr. Roxana Geambasu M.S. in Computer Science	New York, NY Jan 2021–Dec 2025 (anticipated) Sep 2019–Dec 2020
École Polytechnique M.S. in Engineering (<i>Ingénieur Diplômé</i>) — Computer Science B.S. in Engineering (<i>Gradué en Ingénierie</i>)	Palaiseau, FR Sep 2018–Aug 2019 Sep 2016–Aug 2018
Université Paris Nanterre B.S. in Philosophy (<i>Licence de Sciences Humaines et Sociales, Philosophie</i>)	Nanterre, FR 2017–2018
Lycée Sainte-Geneviève Undergraduate program in Mathematics and Physics (<i>Prépa MPSI/MP*</i>)	Versailles, FR Sep 2014–Aug 2016

EXPERIENCE

Columbia University Graduate Research Assistant	New York, NY Jan 2021–present
<ul style="list-style-type: none">– Designed and implemented systems for differential privacy (DP) with Pr. Asaf Cidon and Pr. Roxana Geambasu.– Published our findings at OSDI'21 [5], released a Kubernetes extension: github.com/Columbia/PrivateKube.– Evaluated massively distributed DP training on supercomputers in partnership with Brookhaven National Laboratory. Merged my implementation in PyTorch's DP library: github.com/pytorch/opacus/pull/196	
Microsoft Research Research Intern (remote), Privacy in AI Team. Advisor: Dr. Huseyin Inan.	Redmond, WA May 2022–Aug 2022
<ul style="list-style-type: none">– Applied differential privacy to mixture-of-experts language models.– Implemented and evaluated my algorithms with the Fairseq framework on 2.4-billion-parameter transformers.	
École Normale Supérieure Research Intern (remote), Crypto Team. Advisor: Dr. David Pointcheval.	Paris, FR Jun 2020–Sep 2020
<ul style="list-style-type: none">– Developed privacy-preserving deep learning protocols with Function Secret Sharing, published at PETS'22 [2].– Implemented as a Rust library integrated with the PySyft framework: github.com/OpenMined/sycret.	
Columbia University Teaching Assistant (part-time).	New York, NY Sep 2019–Jun 2020
<ul style="list-style-type: none">– Parallel Functional Programming (Fall 2019). Private Distributed Systems (Spring 2020).	
The University of Sydney Visiting Researcher, Concurrent Systems Research Group. Advisor: Pr. Vincent Gramoli.	Sydney, AU Apr 2019–Aug 2019
<ul style="list-style-type: none">– Designed cross-chain protocols for blockchain scalability, published at SPAA'20 [7].– Formal verification of fault-tolerant distributed algorithms, published at DISC'22 and PODC'22 [1].	
Muvee Technologies Software Engineering Intern.	Singapore, SG Jun 2018–Aug 2018

- Applied machine learning to face recognition in automated photobooks (Python, Tensorflow).
- Implemented and customized recent clustering algorithms (C++, Android).

French Armed Forces.

Officer Cadet. Trained at Saint-Cyr military academy, deployed in French Polynesia (*RSMA*).

Tahiti, PF

Sep 2016–Apr 2017

PUBLICATIONS

Peer-reviewed Conference Proceedings and Workshop Papers

- [1] N. Bertrand, V. Gramoli, I. Konnov, M. Lazić, **P. Tholoni**, and J. Widder, “Holistic Verification of Blockchain Consensus”, in *36th International Symposium on Distributed Computing (DISC 2022)*, C. Scheideler, Ed., ser. Leibniz International Proceedings in Informatics (LIPIcs), vol. 246, Dagstuhl, Germany: Schloss Dagstuhl – Leibniz-Zentrum für Informatik, 2022, 10:1–10:24, ISBN: 978-3-95977-255-6. DOI: 10.4230/LIPIcs.DISC.2022.10.
- [2] T. Ryffel, **P. Tholoni**, D. Pointcheval, and F. Bach, “Ariann: Low-interaction privacy-preserving deep learning via function secret sharing”, *Proceedings on Privacy Enhancing Technologies*, vol. 2022, no. 1, pp. 291–316, 2022. DOI: doi:10.2478/popets-2022-0015.
- [5] T. Luo, M. Pan, **P. Tholoni**, A. Cidon, R. Geambasu, and M. Lécuyer, “Privacy budget scheduling”, in *15th USENIX Symposium on Operating Systems Design and Implementation (OSDI 21)*, USENIX Association, Jul. 2021, pp. 55–74, ISBN: 978-1-939133-22-9.
- [6] **P. Tholoni** and I. Chai, “Bulletproof hosting: Ecosystem and registry-based approaches”, in *Student Symposium in Cybersecurity Policy*, Medford, MA, USA: Tufts University, Feb. 2020.
- [7] R. van Glabbeek, V. Gramoli, and **P. Tholoni**, “Feasibility of Cross-Chain Payment with Success Guarantees”, in *Proceedings of the 32nd ACM Symposium on Parallelism in Algorithms and Architectures*, ser. SPAA ’20, New York, NY, USA: Association for Computing Machinery, Jul. 6, 2020, pp. 579–581, ISBN: 978-1-4503-6935-0. DOI: 10.1145/3350755.3400264.

Book Chapters

- [3] **P. Tholoni** and V. Gramoli, “Formal verification of blockchain byzantine fault tolerance”, in *Handbook on Blockchain*, D. A. Tran, M. T. Thai, and B. Krishnamachari, Eds., Cham: Springer International Publishing, 2022, pp. 389–412, ISBN: 978-3-031-07535-3. DOI: 10.1007/978-3-031-07535-3_12.

Work in Progress

- [4] **P. Tholoni**, K. Kostopoulou, M. Chowdhury, A. Cidon, R. Geambasu, M. Lécuyer, and J. Yang, “Packing Privacy Budget Efficiently”, *arXiv*, Dec. 2022. DOI: 10.48550/arXiv.2212.13228. eprint: 2212.13228.

SKILLS AND LANGUAGES

- **Programming:** Python, Rust, Go, Java, C++, OCaml, Haskell, Coq, EasyCrypt, TLA+, Bash, SQL.
- **Machine Learning & Data:** PyTorch, Opacus, Fairseq, Ray, MLflow, Kubeflow, Gurobi, PostgreSQL, MongoDB.
- **Systems & Cloud:** Linux, SLURM, MPI, Kubernetes, Docker, Google Cloud, Azure ML.
- **Languages:** French (native), English (fluent), Spanish (intermediate), Mandarin & Korean (beginner).