Geoffroy Couteau

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Publications

2021

Breaking the Circuit Size Barrier for Secure Computation under Quasi-Polynomial LPN
In EUROCRYPT 2021
Geoffroy Couteau and Pierre Meyer

Efficient Range Proofs with Transparent Setup from Bounded Integer Commitments
In EUROCRYPT 2021
Geoffroy Couteau, Michael Klooß, Huang Lin, and Michael Reichle

Black-Box Uselessness: Composing Separations in Cryptography
In ITCS 2021
Geoffroy Couteau, Pooya Farshim, and Mohammad Mahmoody

2020

On Pseudorandom Encodings
In TCC 2020
Thomas Agrikola, Geoffroy Couteau, Yuval Ishai, Stanislaw Jarecki, Amit Sahai

Pseudorandom Correlation Functions from Variable-Density LPN
In FOCS 2020
Elette Boyle, Geoffroy Couteau, Niv Gilboa, Yuval Ishai, Lisa Kohl, Peter Scholl

Shorter Non-Interactive Zero-Knowledge Arguments and ZAPs for Algebraic Languages
In CRYPTO 2020
Geoffroy Couteau, Dominik Hartmann

Efficient Pseudorandom Correlation Generators from Ring-LPN
In CRYPTO 2020
Elette Boyle, Geoffroy Couteau, Niv Gilboa, Yuval Ishai, Lisa Kohl, Peter Scholl

Non-Interactive Zero-Knowledge in Pairing-Free Groups from Weaker Assumptions
In EUROCRYPT 2020
Geoffroy Couteau, Shuichi Katsumata, and Bogdan Ursu

The Usefulness of Sparsifiable Inputs: How to Avoid Subexponential iO
In PKC 2020
Thomas Agrikola, Geoffroy Couteau, and Dennis Hofheinz

2019

Efficient Two-Round OT Extension and Silent Non-Interactive Secure Computation
In CCS 2019
Elette Boyle, Geoffroy Couteau, Niv Gilboa, Yuval Ishai, Lisa Kohl, Peter Rindal, Peter Scholl

Efficient Pseudorandom Correlation Generators: Silent OT Extension and More
In CRYPTO 2019
Elette Boyle, Geoffroy Couteau, Niv Gilboa, Yuval Ishai, Lisa Kohl, Peter Scholl

A Note on the Communication Complexity of Multiparty Computation in the Correlated Randomness Model
In EUROCRYPT 2019
Geoffroy Couteau

Designated-Verifier Pseudorandom Generators, and their Applications
In EUROCRYPT 2019
Geoffroy Couteau and Dennis Hofheinz

Non-Interactive Keyed-Verification Anonymous Credentials
In PKC 2019

Geoffroy Couteau and Michael Reichle

2018 On the Concrete Security of Goldreich's Pseudorandom Generator
In ASIACRYPT 2018
Geoffroy Couteau, Aurélien Dupin, Pierrick Méaux, Melissa Rossi, and Yann Rotella

Compressing Vector-OLE
In CCS 2018
Elette Boyle, Geoffroy Couteau, Niv Gilboa, and Yuval Ishai

New Protocols for Secure Equality Test and Comparison
In ACNS 2018
Geoffroy Couteau

Efficient Designated-Verifier Non-Interactive Zero-Knowledge Proofs of Knowledge
In EUROCRYPT 2018
Pyrros Chaidos, and Geoffroy Couteau

2017 Homomorphic Secret Sharing: Optimizations and Applications
In CCS 2017
Elette Boyle, Geoffroy Couteau, Niv Gilboa, Yuval Ishai, and Michele Orrù

Removing the Strong RSA Assumption from Arguments over the Integers
In EUROCRYPT 2017
Geoffroy Couteau, Thomas Peters, and David Pointcheval

2016 Encryption Switching Protocols
In CRYPTO 2016
Geoffroy Couteau, Thomas Peters, and David Pointcheval

2015 Implicit Zero-Knowledge Arguments and Applications to the Malicious Setting
In CRYPTO 2015
Fabrice Benhamouda, Geoffroy Couteau, David Pointcheval, and Hoeteck Wee

Secure Distributed Computation on Private Inputs
In FPS 2015
Geoffroy Couteau, Thomas Peters, and David Pointcheval

Work Experience

Oct 2019 – current
CNRS researcher, IRIF, Université de Paris

Oct 2017 – current
Postdoctoral researcher, Karlsruher Institut für Technologie, Germany

Oct 2014 – Sep 2017
PhD student, École Normale Supérieure de Paris, Crypto Team
under the supervision of David Pointcheval and Hoeteck Wee
Zero-Knowledge Proofs for Secure Computation

Mar 2014 – Sep 2014
Research intern in cryptography in the Crypto team at École Normale Supérieure de Paris
Secure multiparty computation protocols for biometric authentication

Jul 2012 – Sep 2012
Research and Development internship at Criteo, Paris
Research & Development (C#, ASP.NET)

Honors, Awards, and Grants

Jan. 2021 – Jan. 2025	ANR JCJC – project SCENE (€170k) Principal Investigator https://anr.fr/fileadmin/aap/2020/selection/aapg-selection-2020-08-02102020.pdf
2018	GDR computer security PhD prize, Honorary Mention https://gdr-securite.irisa.fr/prix-de-these/

Invited Speaker

Mar 2021	Seminar: Boston University Security Seminar, Boston, USA
Oct 2020	Seminar: UCLA Crypto Seminar, Los Angeles, USA
Sep 2020	Seminar: Cryptography, Network Security and Cybersecurity, West Bengal, India
Nov 2019	Workshop: FILOFOCS, Tel-Aviv, Israel
Nov 2019	Seminar: C2 seminar, Paris, France
Oct 2019	Seminar: ENS Lyon Crypto Seminar, Lyon, France
Feb 2019	Seminar: ENS Lyon Crypto Seminar, Lyon, France
Jan 2019	Seminar: University of Rennes 1 Crypto Seminar, Rennes, France
Jul 2018	Seminar: UCL Crypo Group Seminar, Louvain-la-neuve, Belgium
Jun 2018	Seminar: University of Luxembourg Crypto Seminar, Esch-sur-Alzette, Luxembourg
May 2018	Workshop: Theory and Practice of Secure Multiparty Computation (TPMPC), 2018
Sep 2017	Seminar: Paris Crypto Day, Paris, France
Mar 2017	Workshop: CryptoAction Symposium, 2017
Nov 2016	Seminar: University of Rennes 1 Crypto Seminar, Rennes, France
May 2016	Workshop: Theory and Practice of Secure Multiparty Computation (TPMPC), 2016

Education

2014 – 2017	PhD Thesis, École Normale Supérieure de Paris, Crypto Team *Zero-Knowledge Proofs for Secure Computation*
2013 – 2014	Parisian Master of Research in Computer Science (MPRI), University of Paris-Diderot, Paris *Specialization in algorithmic and cryptography* *highest honours*
2011 – 2014	Engineering school, Télécom ParisTech, Paris *Algebra, Cryptography, Algorithmic and Theoretical Computer Science*
2008 – 2011	Preparatory class for entrance to Grandes Ecoles (MPSI, MP*), Lycée Buffon, Paris
Jul 2008	Bachelor's degree *highest honours*

Supervising

PhD Students

Sep. 2020 –: Pierre Meyer, Secure computation with restricted communication (co-supervised with Elette Boyle, IDC, Israel)

Master Students

Mar. 2021 – Sep. 2021: Clément Ducros, Linear time encodable codes meet secure computation
Mar. 2021 – Sep. 2021: Thi Thuy Dung Bui, Batch equality tests and secure comparison from pseudorandom correlation generators
Feb. 2020 – Aug. 2020: Michael Reichle, Zero-Knowledge Proofs
Apr. 2019 – Oct. 2019: Dominik Hartmann, Compilers for Non-Interactive Zero-Knowledge Proofs

Bachelor Students

Oct. 2018 – Feb. 2019: Sebastian Faller, Lattice-Based Implicit Zero-Knowledge Arguments
May 2018 – Sept. 2018: Michael Reichle, Keyed-Verification Non-Interactive Anonymous Credentials
Nov. 2017 – Mar. 2018: Samuel Kopmann, Improved Designated-Verifier Non-Interactive Zero-Knowledge Arguments

Interns

Nov. 2020 – Apr. 2021: Maryam Zarezadeh (visiting PhD student)
Jul. 2020 – Oct. 2020: Elahe Sadeghi (Summer intern)
Nov. 2019 – Jan. 2020: Pierre Meyer (Intern)

Teaching

2020 – 2021

Secure Computation, M1, Télécom ParisTech
Secure Computation, ANSSI
Analyse de données, L3, Sorbonne université
Introduction à la sécurité, M1, IEDD
Mathématiques discrètes, L3, Université de Paris

2019 – 2020

Secure Computation, M1, Télécom ParisTech
Concepts Informatique, L1, Université de Paris
Analyse de données, L3, Sorbonne université

2017 – 2019

Seminar Organization, KIT, Germany

May. 2019 – Jul. 2019: Advanced Topics in Lattice-Based Cryptography
May. 2019 – Jul. 2019: Foundations of Lattice-Based Cryptography
Oct. 2018 – Feb. 2019: Non-Interactive Zero-Knowledge Proofs
Oct. 2018 – Feb. 2019: Public-Coin Zero-Knowledge Proofs
May. 2018 – Jul. 2018: Cryptography for Smart Meters

2014 – 2017

Teaching assistant at Polytech Paris UMPC

2016 – 2017	Applied Algebra, Compiling (master level)
2014 – 2016	Java, C (bachelor level), Compiling (master level)

Lectures at Télécom ParisTech
Secure Multiparty Computation

Thesis Committee

March 2021

Javier Silva, Zero-knowledge proofs and isogeny-based cryptosystems (Examiner)

Services to the Community

Program Committee

2021	EUROCRYPT 2021, IWSEC 2021
2020	EUROCRYPT 2020, IWSEC 2020, WAHC 2020
2019	TCC 2019, WAHC 2019
2018	INDOCRYPT 2018

External reviewer

Conferences: CRYPTO 2021; PKC 2021; STOC 2021; ASIACRYPT 2020; TCC 2020; FOCS 2020; CRYPTO 2020; ITCS 2020; SAC 2019; CRYPTO 2019; PKC 2019; TCC 2018; CCS 2018; CRYPTO 2018; EUROCRYPT 2018; PKC 2018; ASIACRYPT 2017; TCC 2017; ICALP 2017; ACNS 2017; PKC 2017; CT-RSA 2017; CRYPTO 2016; PKC 2016; CT-RSA 2015; EUROCRYPT 2015.

Journals: Discrete Mathematics (2021) ; Journal of Cryptology (2020) ; ACM Transaction on Computation Theory (2020); Transaction on Dependable and Secure Computing (2020); SN Applied science (2020); Transactions on Information Forensics & Security (2019, 2020); Theoretical Computer Science (2019); Design, Codes, and Cryptography (2018).

Organization

2020 – 2022: I am one of the organizers of the upcoming ICALP 2022, to be held in Paris (with Thomas Colcombet, local chair, and Eva Ryckelynck)

Apr. 2020 – Sep. 2020: Organizer of a regular seminar on privacy in contact tracing (presentations and debates with experts on security and inventors of the StopCovid protocol, co-organized with Alain Passelègue)

2017: Organizer of the Crypto Working Group, ENS
Participation to the organization of EUROCRYPT 2017

Languages

French:	Native
English:	Fluent (C1 CEFR)
German:	Intermediate (B1 CEFR)