Elizabeth C. Crites, Ph.D.

CONTACT INFORMATION

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APPOINTMENTS

The University of Edinburgh, Edinburgh, UK — 2021 –
Research Associate

University College London (UCL), London, UK — 2019 – 2021
Research Fellow

EDUCATION

Brown University, Providence, USA — 2013 – 2019
Ph.D. in Mathematics
Advisor: Anna Lysyanskaya; GPA: 3.9

Columbia University in the City of New York, New York, USA — 2011 – 2013
M.Sc. in Applied Mathematics
Advisors: Richard S. Hamilton & Michael I. Weinstein; GPA: 3.9

The University of Western Ontario, London, Canada — 2006 – 2010
B.Sc. Honours Specialization in Mathematics, with Distinction; GPA: 4.0+

McGill University, Montréal, Canada — 2008
Visiting Scholar, Honours Mathematics

PEER-REVIEWED PUBLICATIONS

How to Prove Schnorr Assuming Schnorr: Security of Multi- and Threshold Signatures.
Elizabeth Crites, Chelsea Komlo, Mary Maller
New proving framework for more efficient multi- and threshold Schnorr signatures.
Under submission. IACR ePrint 2021. 39 pgs.

Mercurial Signatures for Variable-Length Messages.
Elizabeth C. Crites, Anna Lysyanskaya
Extended mercurial signatures to allow messages of unbounded length.
Privacy Enhancing Technologies Symposium – PETS 2021.
IACR ePrint 2020. 41 pgs.

Reputable List Curation from Decentralized Voting.
Elizabeth C. Crites, Mary Maller, Sarah Meiklejohn, Rebekah Mercer
Constructed a token-curated registry from a voting protocol with ballot secrecy.
Privacy Enhancing Technologies Symposium – PETS 2020. 23 pgs.
Concurrent version (major differences) IACR ePrint 2020. 52 pgs.

Delegatable Anonymous Credentials from Mercurial Signatures.
Elizabeth C. Crites, Anna Lysyanskaya
Constructed first efficient scheme for issuing, presenting, and delegating credentials anonymously.
The Cryptographers' Track of the RSA Conference – CT-RSA 2019. 47 pgs.

Doctoral Dissertation

Delegatable Anonymous Credentials from Mercurial Signatures.

Introduced a new type of digital signature, called a mercurial signature, and constructed first efficient delegatable anonymous credential (DAC) scheme. Extended mercurial signatures to allow messages of unbounded length. Constructed DAC scheme for multiple certification authorities.

Brown University Library 2019. 202 pgs.

Master's Research

Studied partial differential equations, such as mean curvature flow and the Ricci flow, used in Richard S. Hamiton's program for solving the Poincaré Conjecture (Millennium Prize Problem).

Presentations

Future of PI: Challenges and Perspectives of Personal Identification Sept. 2021
"Delegatable Anonymous Credentials from Mercurial Signatures"
IEEE European Symposium on Security and Privacy (EuroS&P), Vienna, Austria

University of Waterloo Cryptography, Security, and Privacy Seminar Aug. 2021
"Delegatable Anonymous Credentials from Mercurial Signatures"
University of Waterloo, Canada

PETS 2021 Privacy Enhancing Technologies Symposium July 2021
"Mercurial Signatures for Variable-Length Messages"

PETS 2020 Privacy Enhancing Technologies Symposium July 2020
"Reputable List Curation from Decentralized Voting"
Concordia University & Université du Québec à Montréal, Canada

CT-RSA 2019 The Cryptographers' Track at the RSA Conference Mar. 2019
"Delegatable Anonymous Credentials from Mercurial Signatures"
San Francisco, USA

Women in Theory (WIT) June 2018
"Delegatable Anonymous Credentials from Mercurial Signatures"
Harvard University, Boston, USA

Other Activities

CAPS @ Brown : Cryptography Anonymity Privacy Security 2016 – 2019
Brown University, Providence, USA

Brown-IMPA Watson Brazil Initiative Jan. 2015
Hyperbolic Geometry and Minimal Surfaces
Instituto Nacional de Matemática Pura e Aplicada (IMPA), Rio de Janeiro, Brazil

Brown-Kobe Summer School in High Performance Computing Aug. 2014
K computer, 3D visualization of peridynamic theory of fracture in solid mechanics.
Kobe University, Kobe, Japan

The Mathematics Scholars Group 2008-2010
The University of Western Ontario, London, Canada

Services

I have reviewed papers for the following conferences and journals: Crypto 2022, Designs, Codes and Cryptography (DESI) 2022, ACM Transactions on Privacy and Security (TOPS) 2021, Applied Cryptography and Network Security (ACNS) 2021, IEEE International Conference on Distributed Computing Systems (ICDCS) 2021, ACM Advances in Financial Technologies (AFT) 2020.

Teaching

COMP0141 Security — Spring 2021
Teaching Assistant, University College London

CSCI 1510 Introduction to Cryptography and Computer Security — Spring 2018
Teaching Assistant, Brown University

ENGN 1570 Linear System Analysis — Fall 2015
Teaching Assistant, Brown University

MATH 0100 Introductory Calculus, Part II — Spring 2015
Teaching Assistant, Brown University

MATH 0520 Linear Algebra — Fall 2014
Teaching Assistant, Brown University

Honours, Awards, and Scholarships

Brown-IMPA Watson Brazil Initiative Travel Award — 2015

Brown-Kobe Exchange in High Performance Computing Travel Award — 2014

US Department of Veterans Affairs Scholarship — 2011 – 2014

Columbia University Admission Scholarship — 2011 – 2013

Dean's Honour List, The University of Western Ontario — 2006 – 2010

The University of Western Ontario Admission Scholarship — 2006 – 2010

Languages

English (native), French (basic, passed Brown University Mathematics language exam) — 2017