

# ALIN TOMESCU

## PERSONAL INFORMATION

*email* [atom@alum.mit.edu](mailto:atom@alum.mit.edu)  
*website* <http://alinush.org>  
*github* <https://github.com/alinush>

## EDUCATION

*Doctor of Philosophy*      2015-2019      MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
School: Electrical Engineering and Computer Science  
Thesis: *How to Keep a Secret and Share a Public Key (Using Polynomial Commitments)*  
Advisor: Prof. Srinivas DEVADAS

*Masters of Science*      2013-2015      MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
GPA: 4.7 (out of 5) · Major: Computer Science  
Thesis: *PowMail: Want To Fork? Do Some Work.*  
Description: This thesis explored the idea of using cryptographic puzzles computed by email users to prevent equivocation in public key directories.  
Advisor: Prof. Srinivas DEVADAS

*Bachelors of Science*      2008-2012      STONY BROOK UNIVERSITY  
GPA: 3.98 (out of 4) · Major: Computer Science  
*Summa Cum Laude* · *Honors*  
Advisor: Associate Prof. Radu SION

## RESEARCH EXPERIENCE

*Postdoctoral Researcher*      2020-present      VMWARE RESEARCH GROUP  
Working on applied cryptography for public-key distribution and cryptocurrencies.

*Research Intern*      Summer 2017 & 2018      VMWARE RESEARCH GROUP  
Worked on multi-party computation protocols via verifiable secret sharing.  
Worked on scaling byzantine fault tolerance protocols using threshold signatures. Implemented a fast C++ library for RSA and BLS threshold signatures. Designed efficient anonymous cryptocurrencies without zk-SNARKs.

*Research Assistant*      2013-2020      COMPUTATION STRUCTURES GROUP  
Focused on cryptocurrencies, public-key distribution, authenticated data structures, secure communication, anonymity and secure web applications.  
Affiliations: MIT; CSAIL  
Advisor: Prof. Srinivas DEVADAS

*Research Assistant*      2011-2012      NETWORK SECURITY AND APPLIED CRYPTO LAB  
Worked on access pattern privacy research.  
Developed PrivateFS, the first oblivious filesystem.  
Affiliations: Stony Brook University  
Advisor: Associate Prof. Radu SION

## WORK EXPERIENCE

Head of Research  
and Development

2012–2013,  
Summer 2014 PRIVATE MACHINES

Designed, implemented and deployed the first prototype of the CipherRack secure cloud infrastructure.  
Designed and implemented cryptographic protocols for CipherLocker, a secure searchable cloud file storage engine, as well as other proprietary cryptographic protocols.

Software  
Development  
Engineer in Test  
(Intern)

Summer 2011 MICROSOFT

Developed a flexible performance framework in C# for testing critical Microsoft SQL stored procedures used throughout their AdCenter Business Intelligence system.  
Developed an ASP .NET user interface in C# for charting and graphing performance results across release cycles.  
Developed an automated code deployment tool for running daily basic viability tests on the latest builds.

Information  
Technology  
Specialist

2008–2009 STONY BROOK UNIVERSITY

Developed websites for various programs within the Outreach Division of Stony Brook's Professional Education Program.  
Developed and maintained Microsoft Access databases.  
Created and administered LISTSERV mailing lists.  
Assisted staff with various computer-related issues.

## PUBLICATIONS

*Towards Scalable Threshold Cryptosystems* · IEEE S&P'20 · Alin TOMESCU, Robert CHEN, Yiming ZEHNG, Ittai ABRAHAM, Benny PINKAS, Guy Golan GUETA, Srinivas DEVADAS

*Transparency Logs via Append-only Authenticated Dictionaries* · ACM CCS'19 · Alin TOMESCU, Vivek BHUPATIRAJU, Dimitrios PAPADOPOULOS, Charalampos PAPAMANTHOU, Nikos TRIANDOPOULOS, Srinivas DEVADAS

*Efficient Verifiable Secret Sharing with Share Recovery in BFT Protocols* · ACM CCS'19 · Soumya BASU, Alin TOMESCU, Ittai ABRAHAM, Dahlia MALKHI, Michael K. REITER, Emin Gün SIRER

*SBFT: A Scalable and Decentralized Trust Infrastructure* · DSN'19 · Guy Golan GUETA, Ittai ABRAHAM, Shelly GROSSMAN, Dahlia MALKHI, Benny PINKAS, Michael K. REITER, Dragos-Adrian SEREDINSCHI, Orr TAMIR, Alin TOMESCU

*Catena: Efficient Non-equivocation via Bitcoin* · IEEE S&P'17 · Alin TOMESCU, Srinivas DEVADAS

*PriviPK: Certificate-less and secure email communication* · Computer & Security'17 · Mashael ALSABAH, Alin TOMESCU, Ilia LEBEDEV, Dimitrios SERPANOS, Srinivas DEVADAS

*PrivateFS: A Parallel Oblivious Filesystem* · ACM CCS'12 · Peter WILLIAMS, Radu SION, Alin TOMESCU

## TALKS

*Towards Scalable Threshold Cryptosystems* · BU Security Seminar · Boston University · January 29th, 2020

*Append-only Authenticated Dictionaries and Their Applications* · MIT Digital Currency Initiative · March 27th, 2019

*Append-only Authenticated Dictionaries and Their Applications* · Xi'an International Workshop on Blockchain 2018 · December 14th, 2018

*Append-only Authenticated Dictionaries and Their Applications* · Modular Approach to Cloud Security (MACS) Project Meeting · December 7th, 2018

Bandwidth-efficient Transparency Logs via Append-only Authenticated Dictionaries · VISA Research · July 13th, 2018

Bandwidth-efficient Transparency Logs via Append-only Authenticated Dictionaries · Stanford Security Seminar · Stanford University · June 26th, 2018

Append-only Authenticated Dictionaries and Their Applications · Oasis Labs · June 21st, 2018

Append-only Authenticated Dictionaries and Their Applications · LPD · École Polytechnique Fédérale de Lausanne (EPFL) · January 31st, 2018

Catena: Efficient Non-equivocation via Bitcoin · Cambridge Blockchain Meetup · December 13th, 2017

Append-only Authenticated Dictionaries and Their Applications · Security Reading Group · University of Maryland · October 27th, 2017

Catena: Preventing Lies with Bitcoin · New England Security Day (NESD) · Worcester Polytechnic Institute · November 28th, 2016

Secure communication via proof-of-work · CSAIL Advisory Board · MIT · May 3rd, 2016

Pulsar: A Space and Bandwidth Efficient, Trustworthy Public Key Directory · Digital Currency Initiative (DCI) · MIT · April 6th, 2016

## PANELS

On “blockchains” · TechConnect · Boston University · February 16th, 2018

## OPEN SOURCE CONTRIBUTIONS

[QEMU](#) · [Eucalyptus](#) · [RELIC](#) · [Concord BFT](#) · [libfqfft](#)

## EXTERNAL REVIEWER

Security and Cryptography for Networks (SCN) · 2016

Transactions on Privacy and Security (TOPS) · 2017

Transactions on Privacy and Security (TOPS) · 2019

## TEACHING & MENTORING EXPERIENCE

### *Guest Lectures*

MIT · Spring 2018 · MAS.S62 Cryptocurrency Engineering and Design · Taught a lecture on Bitcoin-based non-equivocation schemes.

2017-2019 MIT PRIMES

### *Research Mentor*

Mentored 4 high school students in applied cryptography research. Planned reasonable research projects for students with deliverables. Met with students weekly to assess progress and discuss research topics.

#### *Student Awards:*

JOHN KUSZMAUL · 2017 Siemens semifinalist  
 ROBERT CHEN · 2017 Siemens semifinalist  
 YIMING ZHENG · 2017 Siemens semifinalist  
 VIVEK BHUPATIRAJU · 2018 Regeneron STS scholar  
 VIVEK BHUPATIRAJU · 2018 ISEF 3rd Special Award (from ACM)  
 VIVEK BHUPATIRAJU · 2018 ISEF 1st Special Award (Science of Security, from NSA)  
 ROBERT CHEN · 2019 Regeneron STS scholar

Teaching Assistant at MIT	Spring 2014	INTRODUCTION TO ALGORITHMS (6.006)	<p>Taught four recitation sessions each week.</p> <p>Taught two review sessions before midterm exams.</p> <p>Developed programming assignments for the problem sets.</p> <p>Wrote recitation notes for students.</p> <p>Developed questions for the student exams.</p> <p>Helped students on the class discussion board and over email.</p> <p>Held biweekly office hours.</p> <p>Provided additional learning resources for my own section students.</p>
	Spring 2011	ADVANCED C/C++ PROGRAMMING (CSE230)	<p>Taught four CSE230 lectures on object oriented design in C++.</p> <p>Helped students with C and C++ programming questions during officer hours.</p>
Teaching Assistant at Stony Brook University	Fall 2009	INTRODUCTION TO JAVA (CSE114)	<p>Held biweekly, one-hour and twenty-minutes programming labs.</p> <p>Responsible for overseeing, teaching and grading thirty students in CSE114.</p> <p>Helped and advised students during office hours and over email.</p>
	2009–2012	STONY BROOK COMPUTING SOCIETY	<p>Taught review sessions for Java programming, discrete mathematics and data structures exams.</p>
OTHER INFORMATION			
Awards			<p>Avery Ashdown Leadership Award · <i>Ashdown House, MIT</i> · 2015 &amp; 2019</p> <p>Academic Excellence in Computer Science · <i>Computer Science Department at Stony Brook University</i> · 2012</p> <p>The SUNY Chancellor's Award for Student Excellence · <i>State University of New York (SUNY)</i> · 2012</p> <p>Undergraduate Recognition Award for Academic Excellence · <i>Stony Brook University</i> · 2012</p> <p>Outstanding Academic Achievement Award · <i>Stony Brook University</i> · 2009–2012</p> <p>University Scholars Senior Leadership Award · <i>Stony Brook University</i> · 2011</p> <p>February 2011 Student of the Month Award · <i>National Residence Hall Honorary Chapter at Stony Brook University</i> · 2011</p>
	Leadership		<p>Graduate Student Leadership Initiative Fellow &amp; Cambridge Fellow · <i>Massachusetts Institute of Technology</i> · Spring 2017</p> <p>Secretary of the Ashdown House Executive Committee · <i>Massachusetts Institute of Technology</i> · 2014–2015</p> <p>President of the Romanian Student Association · <i>Massachusetts Institute of Technology</i> · 2014–2019</p> <p>Student Ambassador for the Stony Brook Computer Science Department · <i>Stony Brook University</i> · 2011–2012</p> <p>Cofounder, Vice-President and President of the Stony Brook Game Developers Club · <i>Stony Brook University</i> · 2009–2010</p>
Communication Skills			<p>Best Computer Science Senior Honors Project Presentation Award · <i>Stony Brook University</i> · 2012</p>
	Languages	ROMANIAN	· Native language

ENGLISH · Fluent  
SPANISH · Basic (simple words and phrases only)  
FRENCH · Basic (simple words and phrases only)

*Interests* Piano · Philosophy · Weightlifting · Dance

February 24, 2020