

Frank Cangialosi

Contact

Email: frankc@csail.mit.edu
Phone: +1 410 375 7977
Webpage: <https://people.csail.mit.edu/frankc>

32-G982, MIT CSAIL
32 Vassar Street
Cambridge, MA 02139

Research Interests

Computer networks and systems, security and privacy, video analytics, distributed systems

Education

Massachusetts Institute of Technology, Cambridge, MA
Ph.D. Student in Computer Science, August 2016 - Present

- Advisors: Hari Balakrishnan, Mohammad Alizadeh

University of Maryland, College Park, MD
B.A. in Economics with Honors, May 2016
B.S. in Computer Science with High Honors, May 2016

- Advisor: Dave Levin, Computer Science
- Gemstone Program, Honors College
- Advisor: Steven M. Anlage, Center for Nanophysics and Advanced Materials
 - Senior Thesis: *Time Reversal as a Novel Method of Wireless Power Transfer*
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Honors and Awards

- Best Artifact Award at ACM EuroSys '21, for *Site-to-Site Internet Traffic Control* **2021**
 - Jacobs Presidential Fellowship, MIT **2016**
 - Best Paper Award at IEEE WPTC '16, for *Time Reversal as a Novel Method of WPT* **2016**
 - CRA Outstanding Undergraduate Researcher Award, Honorable Mention **2015**
 - DellaTorre-Gannon Research Award, University of Maryland **2015**
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Refereed Publications

- Privid: Practical, Privacy-Preserving Video Analytics Queries**
Frank Cangialosi, Neil Agarwal, Venkat Arun, Junchen Jiang, Srinivas Narayana, Anand Sarwate, Ravi Netravali
USENIX NSDI 2022
- Site-to-Site Internet Traffic Control**
Frank Cangialosi, Akshay Narayan, Prateesh Goyal, Radhika Mittal, Mohammad Alizadeh, Hari Balakrishnan
ACM EuroSys 2021 (European Conference on Computer Systems) (**Best Artifact Award**)
- Park: An Open Platform for Learning-Augmented Computer Systems**
Hongzi Mao, Parimarjan Negi, Akshay Narayan, Hanrui Wang, Jiacheng Yang, Haonan Wang, Ryan Marcus, Ravichandra Addanki, Mehrdad Khani Shirkoohi, Songtao He, Vikram Nathan, *Frank Cangialosi*, Shaileshh Venkatakrishnan, Wei-Hung Weng, Song Han, Tim Kraska, Mohammad Alizadeh
NeurIPS 2019
- Restructuring Endpoint Congestion Control**
Akshay Narayan, *Frank Cangialosi*, Deepti Raghavan, Prateesh Goyal, Srinivas Narayana, Radhika Mittal, Mohammad Alizadeh, Hari Balakrishnan
ACM SIGCOMM 2018
- The Case for Moving Congestion Control Out of the Datapath**
Akshay Narayan, *Frank Cangialosi*, Prateesh Goyal, Srinivas Narayana, Mohammad Alizadeh, Hari Balakrishnan
ACM HotNets 2017 (Hot Topics in Networks)

6. **Elasticity Detection: A Building Block for Delay-Sensitive Congestion Control**
Prateesh Goyal, Akshay Narayan, *Frank Cangialosi*, Deepti Raghavan, Srinivas Narayana, Mohammad Alizadeh, Hari Balakrishnan
<https://arxiv.org/abs/1802.08730> (Preprint)
7. **Measurement and Analysis of Private Key Sharing in the SSL Ecosystem**
Frank Cangialosi, TJ Chung, David Choffnes, Dave Levin, Bruce Maggs, Alan Mislove, Christo Wilson
ACM CCS 2016 (Conference on Computer and Communications Security)
8. **Time Reversed Electromagnetic Wave Propagation as a Novel Method of Wireless Power Transfer**
Frank Cangialosi, Tyler Grover, Patrick Healey, Tim Furman, Andrew Simon, Steven Anlage
IEEE WPTC 2016 (Wireless Power Transfer Conference) (**Best Paper Award**)
9. **Picocenter: Supporting Long-Lived, Mostly-Idle Applications in Cloud Environments**
Liang Zhang, James Litton, *Frank Cangialosi*, Theophilus Benson, Dave Levin, Alan Mislove
ACM EuroSys 2016 (European Conference on Computer Systems)
10. **Ting: Measuring and Exploiting Latencies Between All Tor Nodes**
Frank Cangialosi, Dave Levin, Neil Spring
ACM IMC 2015 (Internet Measurement Conference) Long Paper

Research Impact 1. **CCP** (from Restructuring Endpoint Congestion Control, SIGCOMM '18) is integrated with Facebook's mvfst transport protocol (used for a significant portion of traffic for Facebook and Instagram). It is part of an internal platform that is used to easily and safely test new congestion control implementations, especially those developed externally by the broader research community.

Invited Talks

- Privid: Practical Privacy-Preserving Video Analytics Queries*
- NSDI Conference. Renton, WA. **April 2022**
 - MachineLearningApplications@CSAIL Annual Meeting. MIT. **November 2021**
- Site-to-Site Internet Traffic Control*
- EuroSys Conference. Virtual. **April 2021**
- Measurement and Analysis of Private Key Sharing in the SSL Ecosystem*
- CCS Conference. Vienna, Austria. **November 2016**
 - New England Networking and Systems Day. Boston University. **October 2016**
- Time Reversal as a Novel Method of Wireless Power Transfer*
- IEEE WPTC Conference. Aveiro, Portugal. **May 2016**
- Ting: Measuring and Exploiting Latencies Between All Tor Nodes*
- DC-Area Anonymity, Privacy, and Security Seminar. Georgetown University. **November 2015**
 - IMC Conference. Tokyo, Japan. **October 2015**

Graduate Coursework

- MIT 6.874: Computational Systems Biology, David Gifford and Manolis Kellis
 - MIT 6.S978: Negotiation and Influence Skills for Technical Leaders, David Niño
 - MIT 15.481: Financial Market Dynamics and Human Behavior, Andrew Lo
 - MIT 15.401: Managerial Finance, Taha Choukmane
 - MIT 6.854: Advanced Algorithms, David Karger
 - MIT 6.867: Machine Learning, Devavrat Shah, David Sontag and Suvrit Sra
 - MIT 6.824: Distributed Systems, Robert Morris and Frans Kaashoek
 - MIT 6.829: Computer Networks, Hari Balakrishnan and Mohammad Alizadeh
 - UMD CMSC711: Computer Networks, Bobby Bhattacharjee
 - UMD CMSC702: Computational Systems Biology, Zia Khan
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Teaching Assistant

- MIT 6.829: Computer Networks (Graduate), Taught by Hari Balakrishnan and Manya Ghobadi **Fall 2021**
- UMD CMSC414: Computer and Network Security, Taught by Dave Levin **Spring 2016**
- UMD CMSC412: Operating Systems, Taught by Neil Spring **Fall 2015**
- UMD CMSC414: Computer and Network Security, Taught by Dave Levin **Spring 2015**
- UMD CMSC414: Computer and Network Security, Taught by Elaine Shi **Fall 2014**

Professional Experience

- Facebook**, Boston, Massachusetts **2019 – 2021**
Research Contractor
Integrated CCP into Facebook's transport stack and used it to build an internal congestion control experimentation and measurement platform.
- Inizio, Inc.**, San Francisco, California (Remote) **3/2017 – 12/2018**
Contractor, Web Developer
Developed web and mobile applications using React and React Native.
- Bridgery Technologies**, Naples, FL (Remote) **6/2016 – 9/2016**
Contractor, Data Scientist
Built predictive analytics tools for network intrusion detection software (C++).
- Keepsite, Inc.**, London, UK (Remote) **2/2016 – 4/2016**
Contractor, Web Developer
Created new data analytics tools for the platform using D3.js and React.
- Noble Applications**, Madison, Wisconsin (Remote) **8/2013 – 1/2014**
Contractor, Android Developer
Ported existing native iPhone applications to native Android applications.
- StudyBlue, Inc.**, Madison, Wisconsin **5/2013 – 8/2013**
Software Engineering Intern
Refactored a large portion of the StudyBlue web app (3.5 million+ users) to improve client-side performance. Developed new study mode for the StudyBlue Android app (100k+ users).
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