

Taejoong (Tijay) Chung

Assistant Professor (tijay@vt.edu, <https://taejoong.github.io>)

Education

- 09/2009–02/2015 **Ph.D.**, Computer Science and Engineering, Seoul National University, Seoul, Korea.
o Supervisors: Prof. Yanghee Choi and Prof. Ted “Taekyoung” Kwon
- 03/2005–09/2009 **B.S.**, Computer Science and Engineering, POSTECH (Pohang University of Science and Technology), Pohang, Korea.

Professional Experience

- 08/2020–present **Assistant Professor**, Department of Computer Science, Virginia Tech, Blacksburg, VA, United States.
- 02/2023–present **Adjunct Professor**, Department of Computer Science, POSTECH, Pohang, South Korea.
- 08/2018–07/2020 **Assistant Professor**, Department of Computer Science, Rochester Institute of Technology (RIT), Rochester, NY, United States.
- 09/2015–08/2018 **Postdoctoral Researcher**, Northeastern University, Boston, MA, United States.

Honors and Awards

- 2024 NSF CAREER Award
- 2024 Outstanding New Assistant Professor Award at the College of Engineering, Virginia Tech
- 2023 Mutually Agreed Norms for Routing Security (MANRS) Mentor
- 2023 College of Engineering Dean’s Memorandum for Outstanding Teaching Evaluations
- 2022 Best Paper Honorable Mention Award, ACM CCS’22
- 2022 Mutually Agreed Norms for Routing Security (MANRS) Research Fellow
- 2019 Distinguished Paper Award, ACM IMC’19
- 2019 Applied Networking Research Prize (ANRP), IETF’105
- 2019 NSF CRII Award
- 2017 Distinguished Paper Award, USENIX Security’17
- 2015 Microsoft Azure Research “Award Program: Microsoft Azure for Research Supports \$20,000”

Grants

Total: \$5,321,265 **My Share:** \$2,477,170

- 2024 Holistic Measurement and Mitigation of Email Security Vulnerabilities: Infrastructure, Tools, and Commercialization
o Commonwealth Cyber Initiative, 10/2024– 10/2025, Sole Primary Investigator, \$50,000
- 2024 Leveraging ML for Advanced IRR Validation: Towards a More Secure Internet Infrastructure
o Comcast Innovation Fund, 08/2024 – 07/2025, Sole Primary Investigator, \$30,000
- 2024 CAREER: Securing and Evolving Internet Security Protocols for Naming and Routing
o National Science Foundation. CNS-2339378, 05/2024 – 04/2029. Sole Primary Investigator \$691,258 (VT), \$691,258 (total)
- 2023 RoVISTA: Understanding the Current Validation Status of RPKI
o Google, Unrestricted Gift. 08/2023. Sole Primary Investigator \$30,000 (VT)
- 2023 IMR: MT: Tools for Measuring Route Origin Validation in Resource Public Key Infrastructure (RPKI) at Scale

- National Science Foundation. CNS-2323137, 12/2023 – 11/2025. Sole Primary Investigator \$599,997 (VT), \$599,997 (total)
- 2023 SaTC: CORE: Medium: Cryptographic accumulators and revocation of credentials
 - National Science Foundation. CNS-2247306, 01/2023 – 01/2025. Primary Investigator, joint with Foteini Baldimtsi (GMU), Anna Lysyanskaya (Brown), Charalampos Papamanthou (Yale), Alan Mislove (NEU). \$240,000 (VT), \$1,200,000 (total)
- 2023 A Study on Key Management Structure for Multi-Metaverse Avatar Authentication and Anonymization Assurance
 - Ministry of Science and ICT, 01/2023 – 01/2026, Primary Investigator, \$225,000 (VT), \$163 M (total)
- 2022 Towards a complete view of Route Origin Validation in RPKI
 - Comcast Innovation Fund, 06/2022 – 05/2023, Sole Primary Investigator, \$75,000
- 2022 Rapidly Bootstrapping Implementation of DNS-Based Security Extensions with AI-driven Approach
 - 4-VA, 06/2022 – 05/2023, Sole Primary Investigator, \$25,000
- 2022 Improving Routing Security with a Complete View of Routing Origin Validation (ROV) in RPKI
 - Commonwealth Cyber Initiative, 05/2022 – 08/2022, Sole Primary Investigator, \$15,000
- 2021 Enhancing the Privacy and Reliability of Massive-scale Bluetooth Low Energy Contact Tracing
 - Commonwealth Cyber Initiative, 06/2021 – 05/2022. Co-Primary Investigator, joint with Daphne Yao (VT), Carol Fung (VCU) \$100,000 (VT), \$150,000 (total)
- 2019 CNS Core: Large: Collaborative Research: Towards an Evolvable Public Key Infrastructure
 - National Science Foundation. CNS-1901090, 06/2019 – 05/2022. Primary Investigator, joint with Dave Levin (UMD), Bruce M. Maggs (Duke University), Alan Mislove (NEU), Christo Wilson (NEU), Bryan Parno (CMU). \$300,000 (VT), \$2,000,000 (total)
- 2019 CRII: SaTC: Measuring and Improving the Management of Resource Public Key Infrastructure (RPKI)
 - National Science Foundation. CNS-1850465, 10/2019 – 09/2021. Sole Primary Investigator. \$166,561
- 2015 Personal Recommendation System and Privacy Protection through Big Data Analysis on Online Social Networks
 - National Research Foundation of Korea (NRF). NRF-2016018668, 03/2015 – 02/2016. Sole Primary Investigator. ₩50,000,000 (≈ \$44,000)

Refereed Conference Publications

- USENIX ATC'24 **mmTLS: Scaling the Performance of Encrypted Network Traffic Inspection**
J. Yoon, S. Do, D. Kim, **T. Chung**, and K. Park
USENIX Annual Technical Conference, Santa Clara, United States, July 2024
- USENIX Security'24 **SPF Beyond the Standard: Management and Operational Challenges in Practice and Practical Recommendations**
Md. Ishtiaq Ashiq, W. Li, T. Fiebig, and **T. Chung**
USENIX Security, Philadelphia, United States, August 2024
- Oakland'24 **An Analysis of Recent Advances in Deepfake Image Detection in an Evolving Threat Landscape**
S. Muhammad Abdullah, A. Cheruvu, S. Kanchi, **T. Chung**, P. Gao, M. Jadliwala, and B. Viswanath
IEEE Symposium on Security and Privacy, San Francisco, United States, May 2024
- NDSS'24 **IRRedicator: Pruning IRR with RPKI-Valid BGP Insights**
M. Kang, W. Li, R. van Rijswijk-Deij, T. Kown, and **T. Chung**
NDSS, San Diego, USA, Feb. 2024
- HotNets'23 **No Root Store Left Behind**
J. Larisch, W. Aqeel, **T. Chung**, E. Kohler, D. Levin, B. Maggs, B. Parno, and C. Wilson
ACM HotNets, Cambridge, USA, December 2023

- ACSAC'23 **Delegation of TLS Authentication to CDNs using Revocable Delegated Credentials**
D. Yoon, [T. Chung](#), and Y. Kim
ACSAC, Austin, United States, Canada, December 2023
- IMC'23 **RoVista: Measuring and Understanding the Route Origin Validation (ROV) in RPKI**
W. Li, Z. Lin, Md. Ishtiaq Ashiq, E. Aben, R. Fontugne, A. Phokeer, and [T. Chung](#)
ACM IMC, Montreal, Canada, October 2023
- USENIX Security'23 **You've Got Report: Measurement and Security Implications of DMARC Reporting**
Md. Ishtiaq Ashiq, W. Li, T. Fiebig, and [T. Chung](#)
USENIX Security, Anaheim, United States, August 2023
- PAM'23 **Exploring the Evolution of the TLS Certificate Ecosystem**
S. Farhan and [T. Chung](#)
PAM, Virtual, March 2023
- PAM'23 **Measuring TTL Violation of DNS Resolvers in the Wild**
P. Bhowmick, Md. Ishtiaq Ashiq, C. Deccio, and [T. Chung](#)
PAM, Virtual, March 2023
- IMC'22 **A Comparative Analysis of Certificate Pinning in Android & iOS**
A. Pradeep, M. Talha Paracha, P. Bhowmick, A. Davanian, A. Razaghpanah, [T. Chung](#), M. Lindorfer, N. Vallina-Rodriguez, D. Levin, and D. Choffnes
ACM IMC, Nice, France, October 2022
- CCS'22 **Hammurabi: A Framework for Pluggable, Logic-based X.509 Certificate Validation Policies**
J. Larisch, W. Aqeel, C. Wilson, A. Mislove, [T. Chung](#), D. Levin, B. Parno, and B. Maggs
ACM CCS, Los Angeles, CA, USA, Nov 2022
- USENIX Security'22 **Under the hood of DANE mismanagement in SMTP**
H. Lee, Md. Ishtiaq Ashiq, M. Muller, R. van Rijswijk-Deij, T. Kwon, [T. Chung](#)
USENIX Security, Boston, United States, August 2022
- SIGCOMM'21 **IP Unbound: Robust, Responsive CDN-scale service without CDN-Scale Addresses**
M. Fayed, V. Giotsas, L. Bauer, S. Kerola, M. Majkowski, P. Odintsov, J. Sitnicki, [T. Chung](#), D. Levin, A. Mislove, N. Sullivan, C. Wood
ACM SIGCOMM, Virtual Conference, Aug. 2021
- PAM'21 **Measurement and Analysis of Automated Certificate Reissuance**
O. Omolola, R. Roberts, I. Ashiq, [T. Chung](#), D. Levin, and A. Mislove
PAM, Virtual Conference, Mar. 2021
- IMC'20 **The Reality of Algorithm Agility: Studying the DNSSEC Algorithm Life-Cycle**
M. Mueller, W. Toorop, [T. Chung](#), J. Janssen, and R. van Rijswijk-Deij
IMC, Pittsburgh, United States, Oct. 2020
- FCS'20 **Assertion-Carrying Certificates**
W. Aqeel, Z. Hanif, J. Larisch, O. Omolola, [T. Chung](#), D. Levin, B. Maggs, A. Mislove, B. Parno, and C. Wilson
Workshop on Foundations of Computer Security, Boston, United States, June 2020
- USENIX Security'20 **A Longitudinal and Comprehensive Study of the DANE Ecosystem in Email**
H. Lee, A. Gireesh, R. van Rijswijk-Deij, T. Kwon, [T. Chung](#)
USENIX Security, Boston, United States, August 2020
- CCS'19 **You Are Who You Appear to Be: A Longitudinal Study of Domain Impersonation in TLS Certificates**
R. Roberts, Y. Goldschlag, R. Walter, [T. Chung](#), A. Mislove, D. Levin
ACM CCS, London, United Kingdom, Nov. 2019
- IMC'19 **RPKI is Coming of Age: A Longitudinal Study of RPKI Deployment and Invalid Route Origins**
[T. Chung](#), E. Aben, T. Bruijnzeels, B. Chandrasekaran, D. Choffnes, D. Levin, B. M. Maggs, A. Mislove, R. van Rijswijk-Deij, J. P. Rula, and N. Sullivan
ACM IMC, Amsterdam, The Netherlands, Oct. 2019

- IMC'19 **Roll, Roll, Roll your Root: A Comprehensive Analysis of the First Ever DNSSEC Root KSK Rollover**
M. Müller, M. Thomas, D. Wessels, W. Hardaker, **T. Chung**, W. Toorop, and R. van Rijswijk-Deij
ACM IMC, Amsterdam, The Netherlands, Oct. 2019
- NDSS'19 **maTLS: How to Make TLS middlebox-aware?**
H. Lee, Z. Smith, J. Lim, G. Choi, S. Chun, **T. Chung**, and T. Kwon
NDSS, San Diego, USA, Feb. 2019
- IMC'18 **Is the Web Ready for OSCP Must Staple?**
T. Chung, J. Lok, B. Chandrasekaran, D. Choffnes, D. Levin, B. M. Maggs, A. Mislove, J. Rula, N. Sullivan, and C. Wilson
ACM IMC, Boston, USA, Nov. 2018
- CSCW'18 **Privacy Leakage in Event-based Social Networks: A Meetup Case Study**
T. Chung, J. Han, D. Choi, T. Kwon, J. Rha, and H. Kim
ACM CSCW, Jersey City, USA, Nov. 2018
- IMC'17 **Understanding the Role of Registrars in DNSSEC Deployment**
T. Chung, R. van Rijswijk-Deij, D. Choffnes, A. Mislove, C. Wilson, D. Levin, and B. M. Maggs
ACM IMC, London, UK, Nov. 2017
- USENIX Security'17 **A Longitudinal, End-to-End View of the DNSSEC Ecosystem**
T. Chung, R. van Rijswijk-Deij, B. Chandrasekaran, D. Choffnes, D. Levin, B. M. Maggs, A. Mislove, and C. Wilson
USENIX Security, Vancouver, Canada, Aug. 2017
- IMC'16 **Measuring and Applying Invalid SSL Certificates: The Silent Majority**
T. Chung, Y. Liu, D. Choffnes, D. Levin, B. M. Maggs, A. Mislove, and C. Wilson
ACM IMC, Santa Monica, CA, USA, Nov. 2016
- IMC'16 **Tunneling for Transparency: A Large-Scale Analysis of End-to-End Violations in the Internet**
T. Chung, D. Choffnes, and A. Mislove
ACM IMC, Santa Monica, CA, USA, Nov. 2016
- CCS'16 **Measurement and Analysis of Private Key Sharing in the HTTPS Ecosystem**
F. Cangialosi, **T. Chung**, D. Choffnes, D. Levin, B. M. Maggs, A. Mislove, and C. Wilson
ACM CCS, Vienna, Austria, Oct. 2016
- COSN'15 **Characterizing Conversation Patterns in Reddit: From the Perspectives of Content Properties and User Participation Behaviors**
D. Choi, J. Han, **T. Chung**, Y. Ahn, B. Chun, and T. Kwon
ACM COSN, Stanford, CA, USA, Nov. 2015
- COSN'15 **Sharing Topics in Pinterest: Understanding Content Creation and Diffusion Behaviors**
J. Han, D. Choi, A. Choi, **T. Chung**, T. Kwon, J. Rha, and C. Chuah
ACM COSN, Stanford, CA, USA, Nov. 2015
- ANCS'14 **CoRC: Coordinated Routing and Caching for Named Data Networking**
H. Choi, J. Yoo, **T. Chung**, N. Choi, T. Kwon, and Y. Choi
IEEE ANCS, Marina del Rey, CA, USA, Oct. 2014
- WWW'14 **Unveiling Group Characteristics in Online Social Games: A Socio-Economic Analysis**
T. Chung, J. Han, D. Choi, T. Kwon, H. K. Kim and Y. Choi
ISOC WWW, Seoul, Korea, Apr. 2014
- IFIP Networking'13 **Spatial and Temporal Locality of Content in BitTorrent: A Measurement Study**
T. Chung, J. Han, H. Lee, J. Kangasharju, T. Kwon, and Y. Choi
IFIP Networking, Brooklyn, NY, USA, May 2013
- SIGMETRICS'12 **Bundling Practice in Bittorrent: What, How, and Why**
J. Han, S. Kim, **T. Chung**, T. Kwon, H. Kim, and Y. Choi
ACM SIGMETRICS, London, UK, Jun. 2012

IFIP Networking'12 **Content Publishing and Downloading Practice in BitTorrent**
S. Kim, J. Han, T. Chung, T. Kwon, H. Kim, and Y. Choi
IFIP Networking, Prague, Czech, May 2012

GLOBECOM'12 **Bandwidth Allocation for BitTorrent under Multi-Torrent Environments**
J. Choi, J. Han, T. Chung, E. Cho, T. Kwon, and Y. Choi
IEEE GLOBECOM, Houston, Texas, United States, Dec. 2011

Journal Publications

Privacy Guarantees of BLE Contact Tracing: A Case Study on COVIDWISE.

Salman Ahmed, Ya Xiao, T. Chung, Carol Fung, Moti Yung, and Danfeng (Daphne) Yao.
IEEE Computer Society, 2021

Rolling with Confidence: Managing the Complexity of DNSSEC Operations

Moritz Muller, T. Chung, Alan Mislove, and Roland van Rijswijk-Deij
IEEE Transactions on Network and Service Management (IEEE TNSM), 2019

Predicting Content Consumption from Content-to-Content Relationships

Jinyoung Han, Daejin Choi, T. Chung, Chen-Nee Chuah, Hyun-chul Kim, and Ted "Taekyoung" Kwon
Elsevier Journal of Network and Computer Applications (JNCA), Vol. 132, pp. 1, April 2019

A First Look at Certification Authority Authorization (CAA)

Quirin Scheitle, T. Chung, Jens Hiller, Oliver Gasser, Johannes Naab, Roland van Rijswijk-Deij, Oliver Hohlfeld, Ralph Holz, Dave Choffnes, Alan Mislove, and Georg Carle
ACM SIGCOMM Computer Communications Review (CCR), Vol. 48, pp. 2, Apr. 2018

An End-to-End View of DNSSEC Ecosystem Management

T. Chung, R. van Rijswijk-Deij, B. Chandrasekaran, D. Choffnes, D. Levin, B. M. Maggs, A. Mislove, and C. Wilson
USENIX Magazine ;login:, Vol. 42, No. 4, Dec. 2017

A Target-centric Surveillance System based on Localization and Social Networking

J. Han, N. Choi, T. Chung, T. Kwon, and Y. Choi
Multimedia Tools and Applications (MTAP), Vol. 73, Issue 1, pp. 241-265, Nov. 2014

Strategic Bundling for Content Availability and Fast Distribution in BitTorrent

J. Han, T. Chung, S. Kim, H. Kim, J. Kangasharju, T. Kwon, and Y. Choi
Computer Communication (COMCOM), Vol. 43, pp. 64-73, May 2014

Bundling Practice in Bittorrent: What, How, and Why

J. Han, S. Kim, T. Chung, T. Kwon, H. Kim, and Y. Choi
ACM SIGMETRICS Performance Evaluation Review, Vol. 40, No. 1, pp. 77-88, Jun. 2012.

How Prevalent is Content Bundling in BitTorrent?

J. Han, T. Chung, S. Kim, T. Kwon, H. Kim, and Y. Choi
ACM SIGMETRICS Performance Evaluation Review, Vol. 39, No. 1, pp. 319-320, Jun. 2011.

Posters

IMC'19 **Tracking Registrar Support for DNSSEC: It's Slowly Getting Better**
Spencer Roth, R. van Rijswijk-Deij, and T. Chung
IMC, Amsterdam, The Netherlands, USA, Aug. 2017

SIGCOMM'17 **The Root Canary: Monitoring and Measuring the DNSSEC Root Key Rollover**
R. van Rijswijk-Deij, T. Chung, D. Choffnes, A. Mislove, and W. Toorop
SIGCOMM, Los Angeles, CA, USA, Aug. 2017

ACNS'14 **Toward Terabyte-scale Caching with SSD in a Named Data Networking Router**
W. So, T. Chung, H. Yuan, D. Oran, and M. Stapp
ANCS, Marina del Rey, CA, USA, Oct. 2014

PAM'13 **Spatial and Temporal Locality of Swarm Dynamics in BitTorrent**
T. Chung, J. Han, H. Lee, J. Kangasharju, T. Kwon, and Y. Choi
PAM, Hong Kong, March. 2013.

Non-Refereed Conference Publications

TPRC'17 **Investigating End-To-End Integrity Violations in Internet Traffic**
A. Mislove, D. Choffnes, and T. Chung
TPRC, Arlington, VA, USA, Sept. 2017

Teaching

F20, F23 **CS 6204**, Public Key Infrastructure and Network Security.
F22, F23 **CS 5584**, Network Security.
S24 **CS/ECE 5560**, Fundamentals of Information Security.
S21, S22 **CS 4264**, Principles of Computer Security.
F18, F19 **CSCI 351**, Data Communication and Networks.

Advising

01/2024 – Present **Hoang Tran**, Ph.D. Students, Virginia Tech.
08/2023 – Present **Munshi Rejwan Ala Muid**, Ph.D. Students, Virginia Tech, Co-advised with Thang Hoang.
01/2021 – Present **Mohammad Ishtiaq Ashiq Khan**, Ph.D. Students, Virginia Tech.
01/2021 – Present **Weitong Li**, Ph.D. Students, Virginia Tech.
01/2021 – 11/2023 **Protick Bhowmick**, Masters, Virginia Tech, now at Yale University.
08/2020 – 08/2022 **Syed Muhammad Farhan**, Masters, Virginia Tech, now at Amazon.

Ph.D. Committees

Fall 2024 **Daegun Yoon**, KAIST.
Spring 2024 **Aravind Cheruvu**, Virginia Tech.
Spring 2024 **Thomas Nguyen**, Virginia Tech.
Spring 2024 **Zhongdong Liu**, Virginia Tech.
Spring 2024 **Miles Frantz**, Virginia Tech.
Spring 2024 **Muhammad Talha Paracha**, Northeastern University.
Spring 2023 **Tung Dao**, Virginia Tech.
Fall 2022 **Jiameng Pu**, Virginia Tech.

Service

Award Committee Member.
'21, '22, '23, '24 IETF/IRTF Applied Networking Research Prize (ANRP)
'21 ACM Student Research Competition (SRS) for SIGCOMM poster and demo session
General Chair.
'22 The ACM/IRTF Applied Networking Research Workshop (ANRW)
Steering Committee Member.
'23, '24 The ACM/IRTF Applied Networking Research Workshop (ANRW)
Program Committee Member.
'25 USENIX Security (SEC)

'23, '24 The DNS Operations, Analysis, and Research Center (DNS-OARC)

'19, '21, '22, '24 ACM Internet Measurement Conference (IMC)

'22, '24 ACM Conference on emerging Networking EXperiments and Technologies (CoNEXT)

'19, '20, '21, '22, '23, '24, '25 The Passive and Active Measurement (PAM)

'20, '21, '24 The ACM/IRTF Applied Networking Research Workshop (ANRW)

'23, '24 ACM Asian Conference on Internet Engineering (AINTEC)

'23 IEEE SecWeb

'23 IEEE MetaCom Workshop

'22, '23 ACM Conference on SIGMETRICS/Performance

'23 IEEE Symposium on Security and Privacy (Oakland)

'21, '22 IEEE International Conference on Network Protocols (ICNP)

'21 ACM Conference on Computer and Communications Security (CCS) – External reviewer

'20 The Network Traffic Measurement and Analysis Conference (TMA)

'19 International Conference on Social Informatics (SocInfo)

'17, '18, '19 International AAAI Conference on Web and Social Media (ICWSM)

'17 IEEE International Conference on Ubiquitous Computing and Communications (IUCC)

'14 Poster Selection Committee of ACM/IEEE Symposium on Architectures for Networking and Communications Systems (ANCS)

Shadow Program Committee Member.

'18 ACM Internet Measurement Conference (IMC)

'17 ACM Internet Measurement Conference (IMC)

Artifact Evaluation Member.

'20 International Conference on emerging Networking EXperiments and Technologies (CoNEXT)

Web Chair.

'21, '22 ACM SIGCOMM

'21 ACM Internet Measurement Conference (PAM)

'19 ACM Internet Measurement Conference (IMC)

Travel Grant Chair.

'22 ACM Internet Measurement Conference (IMC)

Registration Chair.

'18 ACM Internet Measurement Conference (IMC)

Journal Reviewer.

'24 Journal of Cybersecurity

'23 Journal of Law and Legislation (KJLL)

'19, '23 ACM Transactions on Privacy and Security

'23 ACM Computing Surveys

'22 IEEE Transactions on Dependable and Secure Computing

'21 Elsevier Computers & Security

'19, '21, '24 IEEE/ACM Transactions on Networking

'19 IEEE Transactions on Dependable and Secure Computing

'16, '19, '20, '24 ACM Computer Communication Review

Proposal Reviewer.

'23 National Science Foundation: CNS:NeTS

- '21 The Commonwealth Cyber Initiative (CCI): NextG
Internal and Other Service.
- '22 VT Hacks IX Judge
- '21 Career Panel: BranchOut, A Youth Community Outreach Program for Local High School Students
- '21 VT Hacks IX Judge

References

Alan Mislove (amislove@ccs.neu.edu)

Associate Professor of Computer Science, Northeastern University, USA

David Choffnes (choffnes@ccs.neu.edu)

Associate Professor of Computer Science, Northeastern University, USA

Bruce M. Maggs (bmm@cs.cmu.edu)

Professor of Computer Science, Duke University and Vice President of Research, Akamai Technologies, USA

Christo Wilson (c.wilson@ccs.neu.edu)

Associate Professor of Computer Science, Northeastern University, USA

Dave Levin (dml@cs.umd.edu)

Assistant Professor of Computer Science, University of Maryland, USA