# 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.
- 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 Experiences

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

2024 CAREER: Securing and Evolving Internet Security Protocols for Naming and Routing
- 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
- 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 Security'24 **SPF Beyond the Standard: Management and Operational Challenges in Practice and Practical Recommendations**

Mohammad Ishtiaq Ashiq Khan, Weitong Li, Tobias Fiebig, and Taejoong Chung
USENIX Security, Philadelphia, United States, August 2024

Oakland'24 **An Analysis of Recent Advances in Deepfake Image Detection in an Evolving Threat Landscape**

Sifat Muhammad Abdullah, Aravind Cheruvu, Shravya Kanchi, Taejoong Chung, Peng Gao, Murtuza Jadliwala, and Bimal Viswanath

IEEE Symposium on Security and Privacy, San Francisco, United States, May 2024

NDSS'24 **IRRedicator: Pruning IRR with RPKI-Valid BGP Insights**

Minhyeok Kang, Weitong Li, Roland van Rijswijk-Deij, Ted "Taekyoung" Kown, and Taejoong Chung

NDSS, San Diego, USA, Feb. 2024

HotNets'23 **No Root Store Left Behind**

James Larisch, Waqar Aqeel, Taejoong Chung, Eddie Kohler, Dave Levin, Bruce Maggs, Bryan Parno, and Christo Wilson

ACM HotNets, Cambridge, USA, December 2023

ACSAC'23 **Delegation of TLS Authentication to CDNs using Revocable Delegated Credentials**

Daegeun Yoon, Taejoong Chung, and Yongdae Kim
ACSAC, Austin, United States, Canada, December 2023

IMC'23 **RoVista: Measuring and Understanding the Route Origin Validation (ROV) in RPKI**

Weitong Li, Zhexiao Lin, Mohammad Ishtiaq Ashiq Khan, Emile Aben, Romain Fontugne, Amreesh Phokeer, and Taejoong Chung

ACM IMC, Montreal, Canada, October 2023

USENIX Security'23 **You've Got Report: Measurement and Security Implications of DMARC Reporting**

Mohammad Ishtiaq Ashiq Khan, Weitong Li, Tobias Fiebig, and Taejoong Chung
USENIX Security, Anaheim, United States, August 2023

PAM'23 **Exploring the Evolution of the TLS Certificate Ecosystem**

Syed Muhammad Farhan and Taejoong Chung
Virtual, March 2023

PAM'23 **Measuring TTL Violation of DNS Resolvers in the Wild**

Protick Bhowmick, Mohammad Ishtiaq Ashiq Khan, Casey Deccio, and Taejoong Chung
Virtual, March 2023

IMC'22 **A Comparative Analysis of Certificate Pinning in Android & iOS**

Amogh Pradeep, Muhammad Talha Paracha, Protick Bhowmick, Ali Davanian, Abbas Razaghpanah, Taejoong Chung, Martina Lindorfer, Narseo Vallina-Rodriguez, Dave Levin, and David Choffnes

ACM IMC, Nice, France, October 2022

CCS'22 **Hammurabi: A Framework for Pluggable, Logic-based X.509 Certificate Validation Policies**

James Larisch, Waqar Aqeel, Christo Wilson, Alan Mislove, Taejoong Chung, Dave Levin, Bryan Parno, and Bruce Maggs

ACM CCS, Los Angeles, CA, USA, Nov 2022

USENIX Security'22 **Under the hood of DANE mismanagement in SMTP**

Hyeonmin Lee, Md. Ishtiaq Ashiq, Moritz Muller, Roland van Rijswijk-Deij, Taekyoung Kwon, Taejoong Chung

USENIX Security, Boston, United States, August 2022

SIGCOMM'21 **IP Unbound: Robust, Responsive CDN-scale service without CDN-Scale Addresses**

Marwan Fayed, Vasileios Giotsas, Lorenz Bauer, Sami Kerola, Marek Majkowski, Pavel Odintsov, Jakub Sitnicki, Taejoong Chung, Dave Levin, Alan Mislove, Nick Sullivan, Chris Wood

ACM SIGCOMM, Virtual Conference, Aug. 2021

PAM'21 **Measurement and Analysis of Automated Certificate Reissuance**

O. Omolola, R. Roberts, I. Ashiq, Taejoong 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, Taejoong 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, Taejoong Chung, D. Levin, B. Maggs, A. Mislove, B. Parno, and C. Wilson

the 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, Taejoong 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, Taejoong 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**

Taejoong 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, Taejoong 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, Taejoong Chung, and T. Kwon
NDSS, San Diego, USA, Feb. 2019

IMC'18 **Is the Web Ready for OCSP Must Staple?**

Taejoong 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**

Taejoong 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**

Taejoong 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**

Taejoong 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**

Taejoong 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**

Taejoong 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, Taejoong 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, Taejoong 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, Taejoong 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, Taejoong 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**

Taejoong 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**

Taejoong 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, Taejoong 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, Taejoong 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, Taejoong Chung, E. Cho, T. Kwon, and Y. Choi
IEEE GLOBECOM, Houston, Texas, United States, Dec. 2011

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## Journal Publications

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

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

**Rolling with Confidence: Managing the Complexity of DNSSEC Operations**

Moritz Muller, Taejoong 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, Taejoong 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, Taejoong 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**

Taejoong 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, Taejoong 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, Taejoong 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, Taejoong 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, Taejoong 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 Taejoong 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, Taejoong 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, Taejoong 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**
Taejoong 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 Taejoong Chung
TPRC, Arlington, VA, USA, Sept. 2017

## Fellowships

2012–2016 **Samsung Ph.D. Industrial Scholarship**.

2010–2012 **Hyundai (Hajung) Scholarship**.

Summer 2007 **POSTECH Student Exchange Program to UCLA**.

2005–2008 **National Science & Technology Scholarship, KOSAF(Korea Student Aid Foundation)**.

## Service

**Award Committee Member**.

'24 IETF/IRTF Applied Networking Research Prize (ANRP)

'23 IETF/IRTF Applied Networking Research Prize (ANRP)

'22 IETF/IRTF Applied Networking Research Prize (ANRP)

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

**Program Committee Member**.

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

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

'24 ACM Internet Measurement Conference (IMC)

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

'24 The Passive and Active Measurement (PAM)

'23 ACM Asian Conference on Internet Engineering (AINTEC)

'23 IEEE SecWeb

'23 IEEE MetaCom Workshop

'23 The Passive and Active Measurement (PAM)

'23 ACM Conference on SIGMETRICS/Performance

'23 IEEE Symposium on Security and Privacy (Oakland)

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

'22 ACM Internet Measurement Conference (IMC)

'22 IEEE International Conference on Network Protocols (ICNP)

'22 The Passive and Active Measurement (PAM)

'22 ACM Conference on SIGMETRICS/Performance

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

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

'21 ACM Internet Measurement Conference (IMC)

'21 IEEE International Conference on Network Protocols (ICNP)

'21 The Passive and Active Measurement (PAM)

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

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

'20 The Passive and Active Measurement (PAM)

'19 ACM Internet Measurement Conference (IMC)

'19 International Conference on Social Informatics (SocInfo)

'19 The Passive and Active Measurement (PAM)

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

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

'17 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**.

'22 ACM SIGCOMM

'21 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)

'23 ACM Transactions on Privacy and Security

'23 ACM Computing Surveys

'22 IEEE Transactions on Dependable and Secure Computing

'21 Elsevier Computers & Security

'21 IEEE/ACM Transactions on Networking

'20 ACM Computer Communication Review

'19 IEEE Transactions on Dependable and Secure Computing

'19 IEEE/ACM Transactions on Networking

'19 ACM Transactions on Privacy and Security

'19 ACM Computer Communication Review

'16 ACM Computer Communication Review

**Proposal Reviewer**.

'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