

Hyounghshick Kim

CONTACT INFORMATION	Department of Computer Science and Engineering College of Computing Sungkyunkwan University, Suwon, Korea	office: +82 31 299 4324 mobile: +82 10 5557 3081 e-mail: hyoung@skku.edu
RESEARCH INTERESTS	Usable security, user authentication, software security and social network analysis	
EDUCATION	Ph.D Computer Laboratory, University of Cambridge, UK, 2008–2011 <ul style="list-style-type: none">• Supervisor: Prof. Ross Anderson• Thesis: Complex network analysis for secure and robust communications (Examiners – Prof. Jon Crowcroft and Prof. Alessandro Acquisti) M.S. Division of Computer Science, KAIST, Korea, 1999–2001 <ul style="list-style-type: none">• Supervisor: Prof. Kyung-Yong Chwa• Thesis: A Distributed Algorithm for Maintaining a Minimum Spanning Tree in Dynamic Network B.S. Department of Information Engineering, Sungkyunkwan University, Korea, 1995–1999 <ul style="list-style-type: none">• Supervisor: Prof. Youngik Eom• Thesis: Distributed Mutual Exclusion Algorithm for Maintaining Tree-Height Balance in Mobile Computing Environments	
PROFESSIONAL EXPERIENCE	Sungkyunkwan University , Suwon, Korea <i>Associate Professor</i> – Security Engineering Laboratory 2013–present <ul style="list-style-type: none">• Is researching security engineering. CSIRO Data61 , Marsfield, Australia <i>Distinguished Visiting Researcher</i> – Distributed Systems Security Group 2019–2020 <ul style="list-style-type: none">• Researched AI security and software security. University of British Columbia , Vancouver, BC, Canada <i>Postdoctoral Fellow</i> – Laboratory for Education and Research in Secure Systems Engineering 2012 <ul style="list-style-type: none">• Researched human authentication and information diffusion in online social networks. Samsung Electronics , Digital Media R&D Center, Suwon, Korea <i>Senior Engineer</i> – Core S/W Component Laboratory 2008 <ul style="list-style-type: none">• Designed and developed DRM applications for home networks. Samsung Electronics , Software Laboratories, Seoul/Suwon, Korea <i>Engineer/Senior Engineer</i> – Home Software Platform Team 2004–2007 <ul style="list-style-type: none">• Designed and developed DRM interoperability solutions (DLNA and Coral).	
TEACHING	Lecturer , Sungkyunwan University: Security Engineering (2013–2023) Lecturer , Sungkyunwan University: Usable Security (2022–2023) Lecturer , Sungkyunwan University: Computer Security (2017–2022) Lecturer , Sungkyunwan University: Computer Algorithms (2020–2023) Lecturer , Sungkyunwan University: Blockchain and Smart Contracts (2017–2022) Lecturer , Sungkyunwan University: Network Project (2019) Lecturer , Sungkyunwan University: Data Structures (2014–2018) Lecturer , Yonsei University: Database Security (2015–2017) Lecturer , Sungkyunwan University: C Programming Language (2015–2016) Lecturer , Sungkyunwan University: Introduction to Computer Networks (2013) Lecturer , Sungkyunwan University: Matlab and Python Programming (2013–2014)	

ACADEMIC
SERVICES
(SELECTED)

Consultant

Technical Consultant at LG Electronics	2018–present
Privacy Policy Consultant at Kakao	2018–2021
Technical Consultant at Financial Security Institute	2018–2019
Technical Consultant at Samsung Electronics	2013–2018

Program Committee Member

European Symposium on Research in Computer Security (ESORICS)	2022–2023
Symposium on Usable Privacy and Security (SOUPS)	2022–2023
ACM Asia Conference on Computer & Communications Security (ASIACCS)	2018, 2023
ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec)	2022–2023
Information Security Conference (ISC)	2020–2021
Conference on Security and Privacy in Communication Networks (SecureComm)	2019–2020
Australasian Conference on Information Security and Privacy (ACISP)	2019, 2021
International Conference on Advanced and Trusted Computing (ATC)	2016–2018
ACM/SIGAPP Symposium on Applied Computing (SAC)	2016–2021
International Symposium on Foundations and Practices of Security (FPS)	2012–2021
Workshop on Simplifying Complex Networks for Practitioners (SIMPELX)	2014–2015

Program Committee Chair

World Conference on Information Security Applications (WISA)	2021
Asia Joint Conference on Information Security (AsiaJCIS)	2017
International Conference on Software Security and Assurance (ICSSA)	2015–2020
Workshop on Simplifying Complex Networks for Practitioners (SIMPLEX)	2014

Editorial Board Member

KSII Transactions on Internet and Information Systems	2017–Present
IEEE Consumer Electronics Magazine	2015–2021
International Journal of Privacy and Health Information Management	2012–Present
International Journal of Computer & Software Engineering	2016–Present

HONOURS AND
AWARDS

The best paper award, PLP 2021	2021
The best paper prize, Cybersecurity research competition	2020
The 2nd prize, Cybersecurity research competition	2018–2019
The best impacts, joint award, IEEE Consumer Electronics Magazine	2017
The excellent paper award, ISS	2017
The 1st prize, Cybersecurity research competition	2017
The award for research excellence, Sungkyunkwan University	2016–2019
The best paper award, CISC 2016	2016
The Korean Ministry of Interior award for research excellence, NETSEC-KR 2016	2016
The best student paper award, ICCSA 2015	2015
The best paper award, WISA 2014	2014
The runner-up award, SIMPEX 2014	2014
The 2nd place winner of the Facebook Hackathon, University of British Columbia	2012

NSERC Postdoctoral Fellowship Award, NSERC ISSNet	2012–2013
Research Studentship, Northrop Grumman Corporation	2010–2011
Silver Medal in Samsung Electronics Annual Award, Samsung Electronics	2007

SELECTED
PUBLICATIONS

Siwon Huh, Myungkyu Shim, Jihwan Lee, Simon Woo, **Hyounghshick Kim**, and Hojoon Lee, “DID We Miss Anything?: Towards Privacy-Preserving Decentralized ID Architecture,” *IEEE Transactions on Dependable and Secure Computing*, 2023.

Sowon Jeon, Gilhee Lee, **Hyounghshick Kim**, and Simon Woo, “Design and Evaluation of Highly Accurate Smart Contract Code Vulnerability Detection Framework,” *Data Mining and Knowledge Discovery*, 2023.

Eunil Seo, **Hyounghshick Kim**, Bhaskar Krishnamachari, and Erik Elmroth, “An ICN-based data marketplace model based on a game theoretic approach using quality-data discovery and profit optimization,” *IEEE Transactions on Cloud Computing*, 2023.

Taeyoung Kim, Yunhee Jang, Chanjong Lee, Hyungjoon Koo, and **Hyounghshick Kim**, “SmartMark: Software Watermarking Scheme for Smart Contracts,” *ICSE: The 45th International Conference on Software Engineering, Melbourne*, 2023.

Sanghak Oh, Minwook Lee, Hyunwoo Lee, Elisa Bertino, and **Hyounghshick Kim**, “AppSniffer: Towards Robust Mobile App Fingerprinting Against VPN,” *WWW: The 32nd Web Conference*, 2023.

Mohsen Alawami, Aishwarya Ram Vinay, and **Hyounghshick Kim**, “LocID: A secure and usable location-based smartphone unlocking scheme using Wi-Fi signals and light intensity,” *IEEE Internet of Things*, 2022.

Taegeun Moon, **Hyounghshick Kim**, and Sangwon Hyun, “Mutexion: Mutually Exclusive Compression System for Mitigating Compression Side-Channel Attacks,” *ACM Transactions on the Web*, 2022.

Yansong Gao, Minki Kim, Chandra Thapa, Alsharif Abuadbba, Zhi Zhang, Seyit Camtepe, **Hyounghshick Kim**, and Surya Nepal, “Evaluation and Optimization of Distributed Machine Learning Techniques for Internet of Things,” *IEEE Transactions on Computers*, 2022.

Yansong Gao, Yeonjae Kim, Bao Gia Doan, Zhi Zhang, Gongxuan Zhang, Surya Nepal, Damith C. Ranasinghe, and **Hyounghshick Kim**, “Design and Evaluation of a Multi-Domain Trojan Detection Method on Deep Neural Networks,” *IEEE Transactions on Dependable and Secure Computing*, 2022.

Beom Heyn Kim and **Hyounghshick Kim**, “Rocky: Replicating Block Devices for Tamper and Failure Resistant Edge-based Virtualized Desktop Infrastructure,” *ACSAC: The 37th Annual Computer Security Applications Conference*, 2021.

Larry Huynh, Manh Duy Thai Nguyen, Joshua Goh, **Hyounghshick Kim**, and Jin Hong, “ARGH!: Automated Rumor Generation Hub,” *CIKM: The 30th ACM International Conference on Information and Knowledge Management*, 2021.

Muhammad Ejaz Ahmed, **Hyounghshick Kim**, Seyit Camtepe, and Surya Nepal, “Peeler: Profiling Kernel-Level Events to Detect Ransomware,” *ESORICS: The 26th European Symposium on Research in Computer Security*, 2021.

Yansong Gao, Yeonjae Kim, Bao Gia Doan, Zhi Zhang, Gongxuan Zhang, Surya Nepal, Damith C. Ranasinghe, and **Hyounghshick Kim**, “Design and Evaluation of a Multi-Domain Trojan Detection Method on Deep Neural Networks,” *IEEE Transactions on Dependable and Secure Computing*, 2021.

Geumhwan Cho, Sungsu Kwag, Jun Ho Huh, Bedeuro Kim, Choong-Hoon Lee, and **Hyounghshick Kim**, “Towards Usable and Secure Location-based Smartphone Authentication,” *SOUPS: The 17th Symposium On Usable Privacy and Security*, 2021.

William Aiken, **Hyounghshick Kim**, Simon Woo, and Jungwoo Ryoo, “Neural Network Laundering: Removing Black-Box Backdoor Watermarks from Deep Neural Networks,” *Computers & Security*, 2021.

Bedeuro Kim, Alsharif Abuadbba, Yansong Gao, Yifeng Zheng, Muhammad Ejaz Ahmed, Surya Nepal, and **Hyounghshick Kim**, “Decamouflage: A Framework to Detect Image-Scaling Attacks on CNN,” *DSN: The 51st IEEE/IFIP International Conference on Dependable Systems and Networks*, 2021.

- Siqi Ma, Juanru Li, **Hyounghick Kim**, Elisa Bertino, Surya Nepal, Diet Ostry, and Cong Sun, "Fine with "1234"? An Analysis of SMS One-Time Password Randomness in Android Apps," *ICSE: The 43rd International Conference on Software Engineering*, 2021.
- Beomjin Jin, Jusop Choi, **Hyounghick Kim** and Jin B. Hong, "FUMVar: A Practical Framework for Generating Fully-working and Unseen Malware Variants," *SAC: The 26th ACM/SIGAPP Symposium On Applied Computing*, 2021.
- Sharif Abuadbbba, **Hyounghick Kim** and Surya Nepal, "DeepiSign: Invisible Fragile Watermark to Protect the Integrity and Authenticity of CNN," *SAC: The 26th ACM/SIGAPP Symposium On Applied Computing*, 2021.
- Alsharif Abuadbbba, Kyuyeon Kim, Minki Kim, Chandra Thapa, Seyit A. Camtepe, Yansong Gao, **Hyounghick Kim**, and Surya Nepal, "Can We Use Split Learning on 1D CNN Models for Privacy Preserving Training?," *ASIACCS: The 13rd ACM Asia Conference on Computer and Communications Security*, 2020.
- Joon Kuy Han, Simon Woo, and **Hyounghick Kim**, "A Graphical-Textual Hybrid Fallback Authentication System," *ASIACCS: The 13rd ACM Asia Conference on Computer and Communications Security*, 2020.
- Yansong Gao, Minki Kim, Sharif Abuadbbba, Yeonjae Kim, Chandra Thapa, Kyuyeon Kim, Seyit A. Camtepe, **Hyounghick Kim**, and Surya Nepal, "End-to-End Evaluation of Federated Learning and Split Learning for Internet of Things," *SRDS: The 39th International Symposium on Reliable Distributed Systems*, 2020.
- Geumhwan Cho, Jun Ho Huh, Soolin Kim, Junsung Cho, Heesung Park, Yenah Lee, Konstantin Beznosov, and **Hyounghick Kim**, "On the Security and Usability Implications of Providing Multiple Authentication Choices on Smartphones: The More, the Better?," *ACM Transactions on Privacy and Security*, 2020.
- Muhammad Ejaz Ahmed, Ilyoung Kwak, Jun Ho Huh, Iljoon Kim, Taekkyung Oh and **Hyounghick Kim**, "Void: A fast and light voice liveness detection system," *USENIX Security: The 29th USENIX Security Symposium*, 2020.
- Eun yong Cheon, Yonghwan Shin, Jun Ho Huh, **Hyounghick Kim** and Ian Oakley, "Gesture Authentication for Smartphones: Evaluation of Gesture Password Selection Policies," *S&P: The 41th IEEE Symposium on Security and Privacy*, 2020.
- Simon Woo, Hanbin Jang, Woojung Ji and **Hyounghick Kim**, "I've Got Your Packages: Harvesting customers' delivery order information using package tracking number enumeration," *WWW: The 29th International World Wide Web Conference*, 2020.
- Jusop Choi, Soolin Kim, Junsung Cho, Kuyju Kim, Seok Hong and **Hyounghick Kim**, "ACIDroid: A Practical App Cache Integrity Protection System on Android Runtime," *SAC: The 35th ACM/SIGAPP Symposium On Applied Computing*, 2020.
- Mohsen Alawami and **Hyounghick Kim**, "LocAuth: A Fine-grained Indoor Location-based Authentication System using Wireless Networks Characteristics," *Computers & Security*, 2020.
- Seungjin Lee and **Hyounghick Kim**, "On the robustness of Lightning Network in Bitcoin," *Pervasive and Mobile Computing*, 2020.
- Yuri Son, Geumhwan Cho, **Hyounghick Kim** and Simon Woo, "Understanding Users Risk Perceptions about Personal Health Records Shared on Social Networking Services," *ASIACCS: The 12th ACM Asia Conference on Computer and Communications Security*, 2019.
- Yujin Kwon, **Hyounghick Kim**, Jinwoo Shin and Yongdae Kim, "Bitcoin vs. Bitcoin Cash: Co-existence or Downfall of Bitcoin Cash?," *S&P: The 40th IEEE Symposium on Security and Privacy*, 2019.
- Mahdi D Firoozjaei, Minchang Kim, Jaeseung Song and **Hyounghick Kim**, "O2TR: Offline OTR Messaging System under Network Disruption," *Computers & Security*, 2019.
- Jusop Choi, Jaegwan Yu, Sangwon Hyun and **Hyounghick Kim**, "Digital forensic analysis of encrypted database files in instant messaging applications on Windows operating systems," *DFRWS EU: Digital Forensic Research Workshop EU*, 2019.
- Muhammad Ejaz Ahmed, Saeed Ullah and **Hyounghick Kim**, "Statistical Application Fingerprinting for DDoS Attack Mitigation," *IEEE Transactions on Information Forensics and Security*, 2019.

Julian Rauchberger, Sebastian Schrittwieser, Tobias Dam, Robert Luh, Damjan Buhov, Gerhard Pötzelsberger and **Hyounghick Kim**, “The Other Side of the Coin: A Framework for Detecting and Analyzing Web-based Cryptocurrency Mining Campaigns,” *ARES: The 13th International Conference on Availability, Reliability and Security*, 2018.

DaeHun Nyang, **Hyounghick Kim**, Woojoo Lee, Sung-bae Kang, Geumhwan Cho, Mun-Kyu Lee and Aziz Mohaisen, “Two-Thumbs-Up: Physical Protection for PIN Entry Secure against Recording Attacks,” *Computers & Security*, 2018.

Ian Oakley, Jun Ho Huh, Junsung Cho, Geumhwan Cho, MD. Rasel Islam and **Hyounghick Kim**, “The Personal Identification Chord: A Four Button Authentication System for Smartwatches,” *ASIACCS: The 11th ACM Asia Conference on Computer and Communications Security*, 2018.

Youngbae Jeon, Minchul Kim, Hyunsoo Kim, **Hyounghick Kim**, Jun Ho Huh and Ji Won Yoon, “I’m Listening to your Location! Inferring User Location with Acoustic Side Channel,” *WWW: The 27th International World Wide Web Conference*, 2018.

Eunjo Lee, Jiyoung Woo, **Hyounghick Kim** and Huy Kang Kim, “No Silk Road for Online Gamers!: Using Social Network Analysis to Unveil Black Markets in Online Games,” *WWW: The 27th International World Wide Web Conference*, 2018.

Sangwon Hyun, Jinyoung Kim, **Hyounghick Kim**, Jaehoon Jeong, Susan Hares, Linda Dunbar and Adrian Farrel, “Interface to Network Security Functions for Cloud-based Security Services,” *IEEE Communications Magazine*, 2018.

Soyoung Kim, Sora Lee, Geumhwan Cho, Muhammad Ejaz Ahmed, Jaehoon Paul Jeong and **Hyounghick Kim**, “Preventing DNS amplification attacks using the history of DNS queries with SDN,” *ESORICS: The 22nd European Symposium on Research in Computer Security*, 2017.

Geumhwan Cho, Jun Ho Huh, Junsung Cho, Seongyeol Oh, Youngbae Song and **Hyounghick Kim**, “SysPal: System-guided Pattern Locks for Android,” *S&P: The 38th IEEE Symposium on Security and Privacy*, 2017.

Jun Ho Huh, **Hyounghick Kim**, Rakesh B. Bobba, Konstantin Beznosov and Swathi Sri V Rayala, “I’m too busy to reset my LinkedIn password: On the effectiveness of password reset emails,” *CHI: The 35th ACM SIGCHI Conference on Human Factors in Computing Systems*, 2017.

Seunghun Cha, Sungsu Kwag, **Hyounghick Kim** and Jun Ho Huh, “Boosting the Guessing Attack Performance on Android Lock Patterns with Smudge Attacks,” *ASIACCS: The 10th ACM Asia Conference on Computer and Communications Security*, 2017.

Junsung Cho, Jaegwan Yu, Sanghak Oh, Jungwoo Ryoo, Jaeseung Song and **Hyounghick Kim**, “Wrong Siren! A location spoofing attack on indoor positioning systems: the Starbucks case study,” *IEEE Communications Magazine*, 2017.

Andrea Bianchi, Ian Oakley and **Hyounghick Kim**, “PassBYOP: Bring Your Own Picture for Securing Graphical Passwords,” *IEEE Transactions on Human-Machine Systems*, 2016.

Eunjo Lee, Jiyoung Woo, **Hyounghick Kim**, Aziz Mohaisen and Huy Kang Kim, “You are a Game Bot!: Uncovering game bots in MMORPGs via self-similarity in the wild,” *NDSS: The 23rd Network and Distributed System Security Symposium*, 2016.

Jun Ho Huh, Seongyeol Oh, **Hyounghick Kim**, Konstantin Beznosov, Apurva Mohan, and S. Raj Rajagopalan, “Surpass: System-initiated user-replaceable passwords,” *CCS: The 22nd ACM Conference on Computer and Communications Security*, 2015.

Jun Ho Huh, **Hyounghick Kim**, Rakesh B. Bobba, Masooda Bashir and Konstantin Beznosov, “On the Memorability of System-generated PINs: Can Chunking Help?,” *SOUPS: The 11st Symposium On Usable Privacy and Security*, 2015.

Jaeseung Song, **Hyounghick Kim** and Soojin Park, “Enhancing Conformance Testing using Symbolic Execution for Network Protocols,” *IEEE Transactions on Reliability*, 2015.

Eunhyun Kim, Kyung-won Park, **Hyounghick Kim** and Jaeseung Song, “Design and analysis of enumeration attacks on finding friends with phone numbers: a case study with KakaoTalk,” *Computers & Security*, 2015.

Youngbae Song, Geumhwan Cho, Seongyeol Oh, **Hyounghick Kim** and Jun Ho Huh, “On the Effectiveness of Pattern Lock Strength Meters Measuring the Strength of Real World Pattern Locks,” *CHI: The 33rd ACM SIGCHI Conference on Human Factors in Computing Systems*, 2015.

Hyounghick Kim and Ross Anderson, “An Experimental Evaluation of Robustness of Networks,” *IEEE Systems Journal*, Vol. 7(2), 2013.

Hyoungshick Kim, Jon Crowcroft and Fernando M.V. Ramos, “Efficient Channel Selection Using Hierarchical Clustering,” *WoWMoM: The 13th IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks*, 2012.

John Tang, **Hyoungshick Kim**, Cecilia Mascolo and Mirco Musolesi, “STOP: Socio-Temporal Opportunistic Patching of Short Range Mobile Malware,” *WoWMoM: The 13th IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks*, 2012.

Antoine Boutet, **Hyoungshick Kim** and Eiko Yoneki, “Whats in Your Tweets? I Know Who You Supported in the UK 2010 General Election,” *ICWSM: The 6th International AAAI Conference on Weblogs and Social Media*, 2012.

Hyoungshick Kim and Jun Ho Huh, “PIN selection policies: are they really effective,” *Computers & Security*, Vol. 31(4), 2012.

Hyoungshick Kim, John Tang and Ross Anderson, “Social Authentication: Harder than it Looks,” *FC: The 16th IFCA International Conference on Financial Cryptography and Data Security*, 2012.

Hyoungshick Kim, John Tang, Ross Anderson and Cecilia Mascolo, “Centrality Prediction in Dynamic Human Contact Networks,” *Computer Networks*, Vol. 56(3), 2012.

Hyoungshick Kim and Ross Anderson, “Temporal Node Centrality in Complex Networks,” *Physical Review E*, Vol. 85(2), 2012.

Hyoungshick Kim, Ji Won Yoon and Jon Crowcroft, “Network Analysis of Temporal Trends in Scholarly Research Productivity,” *Journal of Informetrics*, Vol. 6(1), 2012.

Hyoungshick Kim and Jaehoon Jeong, “RAD: Recipient-Anonymous Data Delivery based on Public Routing Proxies,” *Computer Networks*, Vol. 55(15), 2011.

Ji Won Yoon, **Hyoungshick Kim** and Jun Ho Huh, “Hybrid Spam Filtering for Mobile Communication”, *Computers & Security*, Vol. 29(4), 2010.

SELECTED
PATENTS

Sanghoon Jeon, **Hyoungshick Kim**, Minsoo Kim, Kyungwon Park, Junsung Cho and Jaegwan Yu, “Method of sharing key between devices using physical access restriction”, *US Patent (10298557B2)*, 2019.

Bogyeong Kang, **Hyoungshick Kim**, Youngbae Song, Jin-A Kang, Jung-Je Son and Duckey Lee, “Method and apparatus for supporting login through user terminal”, *US Patent (9602506B2)*, 2017.

Hyoungshick Kim and S. Jae Oh, “Method of and Apparatus for Sharing Secret Information between Devices in Home Network”, *EP Patent (2181521B1)*, 2016.

Seong-Ho Cho and **Hyoungshick Kim**, “Authentication information management method in home network and an apparatus therefor”, *EP Patent (2264940B1)*, 2016.

Hyoungshick Kim and S. Jae Oh, “Method of and Apparatus for Sharing Secret Information between Devices in Home Network”, *US Patent (9094192)*, 2015.

Wonseok Kwon and **Hyoungshick Kim**, “Digital rights management method and apparatus”, *US Patent (8931104)*, 2015.

Hyoungshick Kim, “Method and System for Providing DRM License”, *US Patent (8805742)*, 2014.

Hyoungshick Kim, Seongho Cho, Ho-Yeon Park, Dongshin Jung and Wonseok Kwon, “Method and apparatus for generating a mashup graph, and method and apparatus for recommending mashup services”, *US Patent (8813102)*, 2014.

Hyoungshick Kim and Myungsoo Chang, “Method and apparatus for providing content service”, *US Patent (8582759)*, 2013.

Hyoungshick Kim and Sanghyeon Kim, “Apparatus and Method for Providing Domain Information”, *US Patent (8526445)*, 2013.

Hyoungshick Kim and Joo-yeol Lee, “Method and apparatus of ensuring security of communication in home network”, *US Patent (8464055)*, 2013.

Seong-Ho Cho and **Hyoungshick Kim**, “Method and apparatus for managing authentication information in home network”, *US Patent (8347079)*, 2013.

Hyoungshick Kim, Kyung-mo Park and Myungsoo Chang, “Device and method for providing video stream having integrity”, *US Patent (8185742)*, 2012.

Hyoungshick Kim, “Method and system for providing DRM license”, *US Patent (8103593)*, 2012.

Kyung-mo Park, S. Jae Oh, **Hyoungshick Kim** and Yungsun Ryu, “Apparatus and Method for

Providing Security Service in Home Network”, *US Patent* (8060739), 2011.

Hyounghick Kim, Myungsoo Chang and Sanghyeon Kim, “Method and apparatus for providing content service”, *US Patent* (8019080), 2011.

Hyounghick Kim, “Method and apparatus for electronic commerce using digital ticket to provide anonymity” *US Patent* (7730314), 2010.

REFEREES

Professor Ross Anderson

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