Kim, Minsung

Princeton, NJ, USA
minsungk@cs.princeton.edu

RESEARCH INTERESTS

Wireless Systems and Networks
Quantum Computing (Quantum Annealing/Gate Model)
Network Architecture/Protocols
Distributed System and Machine Learning

EDUCATION

Princeton University, NJ July. 2017 - Present
Ph.D. Student in the Department of Computer Science
Advisor: Prof. Kyle Jamieson (kylej@cs.princeton.edu)

- ***Selected Courses:*** Advanced Computer Networks, Advanced Computer Systems, Wireless Networks

Korea University, Seoul Mar. 2010 - Aug. 2016
B.E. in Electrical Engineering, *Graduation with Great Honor (Summa Cum Laude)*
GPA : 3.97 / 4.0 (Original Scale 4.34 / 4.5 and 98.2 / 100) – *Semester High Honors* during all semesters
Advisor: Prof. Sangheon Pack (shpack@korea.ac.kr)

- ***Selected Courses:*** Wireless Networks, Communications Network Design, Mobile Communication Engineering, Communication Theory, Data Communications, Digital Signal Processing, Digital Communications

Stanford University, CA Jun. 2016 - Aug. 2016
Visiting Student, Electrical Engineering

- ***Selected Courses:*** Convex Optimization, Statistical Signal Processing, Colloquium on Computer System

WORK EXPERIENCES

The National Aeronautics and Space Administration (NASA) – Ames Research Center in Silicon Vally, CA
Advisor: Dr. Davide Venturelli (davide.venturelli@nasa.gov)
- Affiliated Researcher, *Quantum Artificial Intelligence Laboratory (QuAIL)* Apr. 2018 - Present
- Research Intern, *Quantum Artificial Intelligence Laboratory (QuAIL)* Jun. 2020 - Aug. 2020
- Research Intern, *Quantum Artificial Intelligence Laboratory (QuAIL)* Jun. 2019 - Sep. 2019
- Visiting Scholar, *Universities Space Research Association (USRA)* July. 2018 - Aug. 2018

RESEARCH EXPERIENCES

Research on Wireless Communication Systems leveraging Quantum Computing July. 2017 - Present
Princeton Advanced Wireless Systems (PAWS) Group, Princeton University – Joint Research with NASA
- Transforming the Sphere Decoder for 5G Massive MIMO Communication with Quantum Computation.
- Led to NSF $372,667 and $277,206 Awards (#1824357, #1824470), Princeton University SEAS Innovation Fund, and the first paper on Quantum Computing in SIGCOMM.

Performance Analysis on LTE Networks based on NS-3 Dec. 2014 - Jun. 2016
Mobile Network & Communications (MNC) Lab, Korea University – Undergraduate Research Student
- Analyzed performance of LTE X2 handover in ultra-small cell networks using NS-3 and Wireshark.

Development on Cloud CDN system and Enterprise Storage using OpenStack Apr. 2016 - Dec. 2016
Hanium ICT Project, National IT Industry Promotion Agency – Joint Research with KT Cloud Team
- Constructed global cloud CDN system and Zadara cloud enterprise storage using OpenStack Cinder.

System Design Research and Development on Android App for Evaluation Feb. 2016 - Oct. 2016

Wireless & Wired Inter-Networking and Evaluation (WINE) Lab, Korea University
- Designed GPS-based warning and detection system for preventing the spread of epidemic diseases.

Independent Research Project 'Smart Public Transportation' using RFID Jun. 2015 - Mar. 2016
7th Creative Challenger Program, Korea University – KU Presidential Best Research Award
- As a research team leader, led a study on service to provide comfort-level in vehicles for public transportation.
- The proposed concept is currently applied to public bus stations in Seoul, Korea.

Survey of Tactile Internet Application & Connected Car Auto-Driving System Apr. 2015 - July. 2015
Qualcomm IT Tour supported by Qualcomm in San Diego, CA
- Presented Tactile Internet-based 3D hologram service and design of VANET-based highway infrastructure.
- Had a lively discussion with Dr. Paul Jacobs, (ex) Executive Chairman of Qualcomm, on wireless technologies.

PUBLICATIONS

M. Kim[+], S. Kasi[+], A. Lott, D. Venturelli, J. Kaewell and K. Jamieson, "Invited Paper: Quantum Computing for Wireless Communications and Networks," ([+]: co-first author) to be Submitted.

M. Kim, S. Mandra, D. Venturelli, and K. Jamieson, "Physics-Inspired Heuristics for Soft MIMO Detection in 5G New Radio and Beyond," Submitted.

M. Kim, D. Venturelli, and K. Jamieson, "Towards Hybrid Classical-Quantum Computation Structures in Wirelessly-Networked Systems," In ACM **HotNets 2020**.

M. Kim, D. Venturelli, and K. Jamieson, "Leveraging Quantum Annealing for Large MIMO Processing in Centralized Radio Access Networks," In ACM **SIGCOMM 2019**.

ACADEMIC HONORS AND AWARDS

Student Spotlight, NASA Ames Research Center Aug. 2020
Outstanding 2020 Research Intern introduced in August Newsletter from NASA Ames Research Center

Graduate School Fellowship, Princeton University 2017-2018 Academic year
Full Fellowship awarded to Princeton Doctoral Students

Great Honor, Korea University August. 2016
Graduation with Great Honor at Korea University

Korea University Presidential Best Research Award March. 2016
Best Undergraduate Research at Creative Challenger Program

Semester High Honors, Korea University 8 Times
Exceptional Grades during All Semesters

Qualcomm IT Tour supported by Qualcomm, CA July. 2015
Selected Excellent Korean Engineering Student by Qualcomm

Korea Telecom (KT) Excellence Award February. 2016
Best Project & Outstanding Intern at KT

Creative Challenger Scholarships, Korea University Jun. 2015 - Mar. 2016
Research Funding for Creative Independent Research & Scholarships for Best Research

National Science and Engineering Scholarship, Korea Student Aid Foundation 5 Times
Full Scholarships for Academic Honors – Fall'10, Spring'14, Fall'14, Fall'15, Spring'16

Best Honors Scholarship, LOTTE Foundation 2 Times
Full Scholarships for Academic Honors – Spring'11, Fall'11

Family Scholarships, Korea University 1 Times
Korea University Entrance Scholarship – Spring'10

TEACHING & PREVIOUS WORK EXPERIENCES

Teaching Assistant, Department of Computer Science, Princeton University
- Wireless Networks — Spring. 2019
- Mobile Computing Design for Assistive Technology — Fall. 2018
- Network Measurement, Sensing, and Visualization Across the Princeton Campus — Fall. 2018

Internship, Department of Wireless Engineering, Korea Telecom — Dec. 2015 - Feb. 2016
Optimized KT's communication systems using wireless network guard system (WING) & antenna tilting.

Intelligence Agent & Translator (Eng), Foreign Affairs Division, National Police — Jun. 2012 - Mar. 2014
Covered special requirement intelligence (SRI) and foreign affairs in Korea. (Military Service in Korea)

Experiment Assistant, DSP Lab, Kyungsung University — Feb. 2012 - Jun. 2012
Soldered AVR (ATMega128) test board and coded the microprocessor for experimental setup.

Presenter at K2 Global Leadership, Keio University, Japan — August. 2015
Discussed the role of Asian Engineering students in academia and industry.

Tutor for Linear Algebra, Korea University — Feb. 2016 - Jun. 2016
Seminar Speaker on General Physics, Korea University — Sep. 2011 - Dec. 2011

TALKS

Conference Talks
- ACM HotNets 20, Chicago, IL (virtual due to COVID-19, planned) — Nov. 2020
- NASA Symposium, NASA Ames Research Center, CA (virtual due to COVID-19) — Aug. 2020
- ACM SIGCOMM 19, Beijing, China — Aug. 2019

Invited Talks
- Wireless Systems and Quantum Computing, Pusan National University — May. 2019

End of CV — ***(latest update: 09/2020)***
References, Prof. Kyle Jamieson, Computer Science Dept, Princeton University (kylej@cs.princeton.edu)
References, Dr. Davide Venturelli, NASA ARC & USRA RIACS (DVenturelli@usra.edu)
References, Prof. Sangheon Pack, Electrical Engineering Dept, Korea University (shpack@korea.ac.kr)

Links

PAWS Research Group:
https://paws.cs.princeton.edu/

LINKED IN:
https://www.linkedin.com/in/minsung-kim-093407132?trk=nav_responsive_tab_profile_pic