Jeongyeup Paek

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Chung-Ang Univeristy
School of Computer Science and Engineering

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RESEARCH INTERESTS

Research challenges in networked computer systems including but not limited to reliable communication and data transport in embedded wireless networks, practical design and real-world deployment of wireless networks, mobile embedded services and systems, and low-power lossy network for Internet of Things.

EDUCATION

University of Southern California, Los Angeles, California
Ph.D. in Computer Science, December 2010
Dissertation Title: Rate Adaptation in Networks of Wireless Sensors
Advisor: Dr. Ramesh Govindan

University of Southern California, Los Angeles, California
M.S. in Electrical Engineering, May 2005

Seoul National University, Seoul, Republic of Korea
B.S. in Electrical Engineering, February 2003

WORK EXPERIENCE

Chung-Ang University, Seoul, Republic of Korea,

Associate Professor, School of Computer Science and Engineering
September 2018 – current

Assistant Professor, School of Computer Science and Engineering
September 2015 – August 2018

Research on Wireless Networks, Mobile Systems, Blockchain, and Internet of Things
Teaching Computer System Organization, Data Communication, and Wireless Networks

Hongik University, Sejong, Republic of Korea,

Assistant Professor, Department of Computer Information Communication
February 2014 – August 2015

Research on Low-power and Lossy Networks, WSN, and Mobile Systems
Teaching Programming, Algorithms, and Electric Circuits

Cisco Systems, Inc., San Jose, CA,

Technical Leader, Internet of Things Group (IoTG)
November 2012 – February 2014

Senior Software Engineer, Connected Energy Networks Business Unit
July 2011 – November 2012

Research and development on Embedded Wireless Mesh Network for Smart Electric Grid
- IPv6-based Wireless Mesh Network (CG-Mesh) on IETF RPL and 6LOWPAN
- IEEE 802.15.4 900MHz RF Mesh and IEEE P1901.2 PLC-based Mesh

University of Southern California, Embedded Networks Laboratory, Los Angeles, CA,
Postdoctoral Research Associate : November 2010 – July 2011.
on energy-efficient design, implementation, and evaluation of
- Energy-Efficient Positioning for Smartphones (RAPS, CAPS), and
- Cloud-Enabled Mobile Smartphone Systems (Urban Tomography, SALSA).

Research Assistant : January 2004 – November 2010.
on design, implementation, experimentation, and real-world deployments of several Wireless Sensor Network (WSN) system projects including,
- An Architecture for Tiered Embedded Networks (Tenet),
- Congestion-Controlled Reliable Transport Protocol (RCRT), and
- Structural Health Monitoring Systems (NetSHM, Wisden).

Deutsche Telekom Inc., R&D Lab USA, Los Altos, CA,
Research Intern : May 2010 – Aug 2010.
on design, implementation, and evaluation of energy-efficient positioning service on Android-OS based mobile smartphones.

Seoul National University, Multimedia Wireless Networks Laboratory, Seoul, Rep. of Korea, January 2003 – June 2003. Advisor: Dr. Sunghyun Choi
Research staff on design and implementation of QoS support and throughput enhancement in 802.11b access points using service-based priority queues and packet combining mechanism.

Military Service in Korean Army, The 28th Division, Regiment 82, 3rd Battalion, Rep. of Korea Jan 1999 – Mar 2001. Soldier in charge of the Department of Human Affairs.

PUBLICATIONS

Selected Recent Publications

[1] Jaewon Choi, Hyeonjung Park, Jeongyeup Paek, Rajesh Krishna Balan and JeongGil Ko, **LpGL: Low-power Graphics Library for Mobile AR Headsets**, In Proceedings of The 17th ACM International Conference on Mobile Systems, Applications, and Services (MobiSys'19), June 17-21 2019. (acceptance ratio: 40/172 = 23.2%)

[2] Moonbeom Kim, Jongho Lee, Jeongyeup Paek, **Neutralizing BLE Beacon-based Electronic Attendance System using Signal Imitation Attack**, IEEE Access, Vol.6, December 2018. (SCIE impact factor 3.557)

[3] Younghoon Song, Hyungsik Shin, Jeongyeup Paek, **Light-weight Server-assisted H-K Compression for Image-based Embedded Wireless Sensor Network**, IEEE Systems Journal, 2018. (SCIE impact factor 4.337)

[4] Jaeyeon Park, Woojin Nam, Taeyoung Kim, Jaewon Choi, Sukhoon Lee, Dukyong Yoon, Jeongyeup Paek, and JeongGil Ko, **Glasses for the Third Eye: Improving Clinical Data Analysis with Motion Sensor-based Filtering**, In Proceedings of The 15th ACM International Conference on Embedded Networked Sensor Systems (SenSys'17), November 5-8 2017. (acceptance ratio: 26/152 = 17.1%)

[5] Hyung-Sin Kim, JeongGil Ko, David E. Culler, and Jeongyeup Paek, **Challenging the IPv6 Routing Protocol for Low-Power and Lossy Networks (RPL): A Survey**, IEEE Communications Surveys and Tutorials, Vol. 19, Issue 4, September 2017. (impact factor 17.188) (citation count 47)

[6] Hyung-Sin Kim, Hongchan Kim, Jeongyeup Paek, and Saewoong Bahk, **Load Balancing under Heavy Traffic in RPL Routing Protocol for Low Power and Lossy Networks**, IEEE Transactions on Mobile Computing, Volume 16, Issue 4, pp. 964-979, April 2017. (SCI impact factor 3.822) (citation count 23)

[7] Hyung-Sin Kim, Jeongyeup Paek, David E. Culler, and Saewoong Bahk **Do Not Lose Bandwidth: Adaptive Transmission Power and Multihop Topology Control**, IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS'17), June 5-7 2017. (acceptance ratio: 18/50 = 36%) – *Best Paper Award Candidate*

[8] Jeongyoon Heo, Jung Jun Kim, Jeongyeup Paek, and Saewoong Bahk **Dodge-Jam: Anti-Jamming Technique for Low-power and Lossy Wireless Networks**, IEEE International Conference on Sensing, Communication and Networking (SECON'17), June 12-14 2017. (acceptance ratio: 45/170 = 26.4%) (citation count 10)

[9] Hyung-Sin Kim, Hosoo Cho, Myung-Sup Lee, Jeongyeup Paek, JeongGil Ko and Saewoong Bahk, **MarketNet: An Asymmetric Transmission Power-based Wireless System for Managing e-Price Tags in Markets**, In Proceedings of The 13th ACM International Conference on Embedded Networked Sensor Systems (SenSys'15), Nov. 2015. (acceptance ratio: 27/132 = 20.4%) (citation count 25)

Selected Top Conference Publications

[10] Hyung-Sin Kim, Jeongyeup Paek, and Saewoong Bahk, **QU-RPL: Queue Utilization based RPL for Load Balancing in Large Scale Industrial Applications**, In Proceedings of The 12th IEEE International Conference on Sensing, Communication, and Networking (SECON'15), June 2015. (acceptance ratio: 55/194 = 28.3%) (citation count 44)

[11] Jeongyeup Paek, Kyu-Han Kim, Jatinder P. Singh, Ramesh Govindan, **Energy-Efficient Positioning for Smartphones using Cell-ID Sequence Matching**, In Proceedings of The 9th International Conference on Mobile Systems, Applications, and Services (MobiSys'11), June 2011. (acceptance ratio: 17.7%) **(citation count 165)**

[12] Jeongyeup Paek, Joongheon Kim, Ramesh Govindan, **Energy-Efficient Rate-Adaptive GPS-based Positioning for Smartphones**, In Proceedings of The 8th International Conference on Mobile Systems, Applications, and Services (MobiSys'10), June 2010. (acceptance ratio: 20.1%) **(citation count 512)**

[13] Moo-Ryong Ra, Jeongyeup Paek, Abhishek B. Sharma, Ramesh Govindan, Martin H. Krieger, Michael J. Neely, **Energy-Delay Tradeoffs in Smartphone Applications**, In Proceedings of The 8th International Conference on Mobile Systems, Applications, and Services (MobiSys'10), Jun. 2010. (acceptance ratio: 20.1%) **(citation count 310)**

[14] Kevin Klues, Chieh-Jan Liang, Jeongyeup Paek, Razvan Musaloiu-E, Phil Levis, Andreas Terzis, Ramesh Govindan, **TOSThreads: Thread-Safe and Non-Invasive Preemption in TinyOS**, In Proceedings of The 7th ACM Conference on Embedded Networked Sensor Systems (SenSys'09), Nov. 2009. (acceptance ratio: 21/119 = 17.6%) **(citation count 129)**

[15] Jeongyeup Paek, Ramesh Govindan, **RCRT: Rate-Controlled Reliable Transport for Wireless Sensor Networks**, In Proceedings of The 5th ACM Conference on Embedded Networked Sensor Systems (SenSys'07), Nov. 2007. (acceptance ratio: 25/149 = 16.8%) **(citation count 274)**

[16] Omprakash Gnawali, Ben Greenstein*, Ki-Young Jang, August Joki, Jeongyeup Paek*, Marcos Vieira, Deborah Estrin, Ramesh Govindan, Eddie Kohler, **The TENET Architecture for Tiered Sensor Networks**, In Proceedings of The 4th ACM Conference on Embedded Networked Sensor Systems (SenSys'06), Nov. 2006. (acceptance ratio: 24/122 = 19.7%) **(citation count 388)** (* : corresponding author)

[17] Krishna Chintalapudi, Jeongyeup Paek, Omprakash Gnawali, Tat Fu, Karthik Dantu, John Caffrey, Ramesh Govindan, and Erik Johnson, **Structural Damage Detection and Localization Using NetSHM**, In Proceedings of Fifth International Conference on Information Processing in Sensor Networks: Special track on Sensor Platform Tools and Design Methods for Networked Embedded Systems (IPSN/SPOTS'06), Apr. 2006. (acceptance ratio: 14/52 = 26.9%) **(citation count 102)**

Journal Articles

[18] Nhu-Ngoc Dao, Minho Park, Joongheon Kim, Jeongyeup Paek, Sungrae Cho, **Resource-aware relay selection for inter-cell interference avoidance in 5G heterogeneous network for Internet of Things systems**, Future Generation Computer Systems, Vol. 93, pp. 877-887, April 2019. (SCIE impact factor 3.997)

[19] Seungbeom Jeong, Eunjeong Park, Dongyeon Woo, Hyung-Sin Kim, Jeongyeup Paek, Saewoong Bahk, **MAPLE: Mobility Support using Asymmetric Transmit Power in Low-power and Lossy Networks.**, Journal of Communications and Networks (JCN), Vol. 20, Issue 4, pp. 414-424, August 2018. (SCIE impact factor 1.13)

[20] Jungmo Ahn, JaeYeon Park, Jeongyeup Paek, JeongGil Ko, **Convolutional Neural Network-based Classification System Design with Compressed Wireless Sensor Network Images**, PLOS ONE 13(5): e0196251, May 2018. (SCIE impact factor 2.806)

[21] Hyungsik Shin, Jeongyeup Paek, **Automatic Task Classification via Support Vector Machine and Crowdsourcing**, Mobile Information Systems, Vol. 2018, no. 6920679, May 2018. (SCIE impact factor 0.849)

[22] Jeongyoon Heo, Jung Jun Kim, Jeongyeup Paek, Saewoong Bahk, **Mitigating Stealthy Jamming Attacks in Low-power and Lossy Wireless Networks**, Journal of Communications and Networks (JCN), Vol. 20, no. 2, pp. 219-230, April 2018. (SCIE impact factor 1.13)

[23] Jeongyeup Paek, JeongGil Ko, **K-Means Clustering based Data Compression Scheme for Wireless Imaging Sensor Networks**, IEEE Systems Journal, Volume 11, Issue 4, pp. 2562-2662, December 2017. (SCIE impact factor 3.882)

[24] Jeongyeup Paek, JeongGil Ko, and Hyungsik Shin **A Measurement Study of BLE iBeacon and Geometric Adjustment Scheme for Indoor Location-Based Mobile Applications**, Mobile Information Systems, vol. 2016, Article ID 8367638, 2016. (SCIE impact factor 1.462) (citation count 28)

[25] **Reducing hops without extra power: Impact of deployment height on low-power multi-hop wireless network**, Hoon Jeong, Changwon Lee, Jaehong Ryu, Byung-Chul Choi, Jeong-Gil Ko, and Jeongyeup Paek, International Journal of Distributed Sensor Networks, Vol.13 no.9, 1550147717732444, September 2017. (impact factor 1.239)

[26] Nhu-Ngoc Dao, Junwook Lee, Duc-Nghia Vu, Jeongyeup Paek, Joongheon Kim, Sungrae Cho, Ki-Sook Chung and Changsup Keum, **Adaptive Resource Balancing for Serviceability Maximization in Fog Radio Access Networks**, IEEE Access, 2017. (SCIE impact factor 3.244)

[27] JeongGil Ko, Sang Gi Hong, Byung-Bog Lee, Naesoo Kim, Jeongyeup Paek, **Transmission Power Control and Sensor Node Reprogramming for Smartphone-WSN Interaction**, International Journal of Sensor Networks (IJSNet), Vol. 25, No. 4, 2017. (SCIE impact factor 0.635)

[28] Hyung-Sin Kim, Heesu Im, Myung-Sup Lee, Jeongyeup Paek, and Saewoong Bahk, **A Measurement Study of TCP over RPL in Low-power and Lossy Networks**, Journal of Communications and Networks (JCN), Vol. 17, no. 6, pp. 647-655, December 2015. (SCIE impact factor 1.007) (citation count 29)

[29] Jeongyeup Paek and Byung-Seo Kim, **Enhancing IEEE 802.15.4-based Wireless Networks to handle Loss of Beacon Frames**, IEICE Transactions on Information and System, Vol.E98-D, No.12, pp.2333-2336, December 2015. (impact factor 0.213)

[30] JeongGil Ko, Byung-Bog Lee, Kyesun Lee, Sang Gi Hong, Naesoo Kim, and Jeongyeup Paek, **Sensor Virtualization Module: Virtualizing IoT Devices on Mobile Smartphones for Effective Sensor Data Management**, International Journal of Distributed Sensor Networks, Vol. 2015, Article ID 730762, 2015. (impact factor 0.665) (citation count 17)

[31] JeongGil Ko, Jongsoo Jeong, Jongjun Park, Jong Arm Jun, Omprakash Gnawali, Jeongyeup Paek, **DualMOP-RPL: Supporting Multiple Modes of Downward Routing in a Single RPL Network**, ACM Transactions on Sensor Networks (TOSN), Volume 11, Issue 2, Article No. 39, February 2015. (SCIE impact factor 1.463 (5-yr 2.754)) (citation count 38)

[32] Jeongyeup Paek, **Fast and Adaptive Mesh Access Control in Low-power and Lossy Networks**, IEEE Internet of Things Journal (IoTJ), Volumn 2, Issue 5, pp.435-444, 1 October 2015.

[33] Jeongyeup Paek, John Hicks, Sharon Coe, Ramesh Govindan, **Image-Based Environmental Monitoring Sensor Application Using an Embedded Wireless Sensor Network**, Sensors, Vol. 14 no. 9: 15981-16002, 28 Aug. 2014. (SCIE impact factor 2.048 (5-yr 2.457)) (citation count 40)

[34] Jeongyeup Paek, Ramesh Govindan, **RCRT : Rate-Controlled Reliable Transport Protocol for Wireless Sensor Networks**, ACM Transactions on Sensor Networks (TOSN), Vol.7, Issue.3, Article 20, September 2010. (SCIE impact factor 2.282 (5-yr 3.77)) (citation count 90 (conference version 274))

[35] Jeongyeup Paek, Michael Neely, **Mathematical Analysis of Throughput Bounds in Random Access with ZigZag Decoding**, Journal of Mobile Networks and Applications (MONET), 2010. (SCIE impact factor 0.838) (citation count 13)

[36] Jeongyeup Paek, Ben Greenstein, Omprakash Gnawali, Ki-Young Jang, August Joki, Marcos Vieira, John Hicks, Deborah Estrin, Ramesh Govindan, Eddie Kohler, **The Tenet Architecture for Tiered Sensor Networks**, ACM Transactions on Sensor Networks (TOSN), Vol.6, Issue.4, Article 34, 2010. (SCIE impact factor 2.282 (5-yr 3.77)) (citation count 68 (conference version 388))

[37] Martin H. Krieger, Moo-Ryong Ra, Jeongyeup Paek, Ramesh Govindan, Jeniffer Evans-Cowley, **Urban Tomography**, Journal of Urban Technology, Vol. 17, Issue 2, Pages 21–36, 2010. (SSCI impact factor 0.586) (citation count 19)

[38] Martin H. Krieger, Ramesh Govindan, Moo-Ryong Ra, Jeongyeup Paek, **Commentary: Pervasive Urban Media Documentation**, Journal of Planning Education and Research (JPER), Vol. 29, No. 1, pp. 114–116, Sep. 2009. (SSCI impact factor 0.698) (citation count 13)

[39] Krishna Chintalapudi, Jeongyeup Paek, Nupur Kothari, Sumit Rangwala, John Caffrey, Ramesh Govindan, Erik Johnson, Sami Masri, **Monitoring Civil Structures with a Wireless Sensor Network**, IEEE Internet Computing, Vol.10, No.2, pp. 26-34, Mar/Apr, 2006. (SCI impact factor 3.108) **(citation count 318)**

Other Conference/Workshop Publications

[40] Weiping Sun, Jeongyeup Paek, and Sunghyun Choi, **CV-Track: Leveraging Carrier Frequency Offset Variation for BLE Signal Detection**, In Proceedings of the 4th ACM Workshop on Hot Topics in Wireless (HotWireless'17), October 16, 2017.

[41] Jungmo Ahn, Jeongyeup Paek, and JeongGil Ko, **Machine Learning-Based Image Classification for Wireless Camera Sensor Networks**, In Proceedings of The IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA), Aug. 2016,

[42] Jeongyeup Paek, Michael Neely, **Mathematical Analysis of Throughput Bounds in Random Access with ZigZag Decoding**, In Proceedings of The 7th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt'09), June 2009. (acceptance ratio: 45/135 = 33.3%)

[43] John Hicks, Jeongyeup Paek, Sharon Coe, Ramesh Govindan, Deborah Estrin, **An Easily Deployable Wireless Imaging System**, In Proceedings of ImageSense08: Workshop on Applications, Systems, and Algorithms for Image Sensing, Nov. 2008. *- Best Paper Award* (citation count 24)

[44] Jeongyeup Paek, Omprakash Gnawali, Ki-Young Jang, Daniel Nishimura , Ramesh Govindan, John Caffrey, Mazen Wahbeh, and Sami Masri, **A Programmable Wireless Sensing System for Structural Monitoring**, In 4th World Conference on Structural Control and Monitoring (4WC-SCM), July 2006. (citation count 40)

[45] Tat Fu, Krishna Chintalapudi, Jeongyeup Paek, Eric Johnson, Ramesh Govindan, **Distributed Damage Localization Scheme for Structural Health Monitoring System using Wireless Sensor Networks**, In 4th World Conference on Structural Control and Monitoring (4WCSCM), July 2006.

[46] Krishna Chintalapudi, Jeongyeup Paek, Ramesh Govindan, and Erik Johnson, **Embedded Sensing of Structures: A Reality Check**, In The 11th IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA2005), Aug, 2005. (citation count 24)

[47] Jeongyeup Paek, Krishna Chintalapudi, John Caffrey, Ramesh Govindan, Sami Masri, **A Wireless Sensor Network for Structural Health Monitoring: Performance and Experience**, In The Second IEEE Workshop on Embedded Networked Sensors (EmNetS-II), May, 2005. (acceptance ratio: 17/43 = 39.5%) **(citation count 351)**

[48] Youngkyu Choi, Jeongyeup Paek, Sunghyun Choi, Go Woon Lee, Jae Hwan Lee, Hanwook Jung, **Enhancement of a WLAN-Based Internet Service in Korea**, In Proceedings of ACM International Workshop on Wireless Mobile Applications and Services on WLAN Hotspots (WMASH'03), Sep, 2003. (citation count 12)

LEADERSHIP AND SERVICE EXPERIENCES

Research Community Services (Recent 3 years only):

(2019) ACM MobiSys 2019 - *Finance Chair (Treasurer) / Organizing Committee*
COMSNETS 2020 - *TPC member*

(2018) ICTC 2018 - *Publication Chair / Organizing Committee*
Journal of Communications and Networks - *Editor*
IEEE CCNC 2019, ICUFN 2018 - *TPC member*

(2017) IEEE CCNC 2018, ICOIN 2018, ICTC 2017 - *TPC member*
Journal of Communications and Networks - *Editor*
Mobile Information Systems - *Guest Editor*

(2016) IEEE Infocom 2017 - TPC member
ICUFN 2016, IEEE CCNC 2017, ICTC 2016 - TPC member

(2015) ACM SenSys 2015 - *Local Arrangement co-Chair / Organizing Committee*
IEEE Infocom 2016 - *TPC member*

Professional Membership:
- IEEE Senior Member since 2018, Member since 2014.
- ACM Member since 2014.

Technical Reviewer (selected, recent 3 years only):
 (2019) ACM Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT/Ubicomp),
         IEEE Systems Journal,
         IEEE Networking Letters,
         IEEE Access,
 (2018) IEEE Transactions on Mobile Computing,
         IEEE Systems Journal,
         Journal of Network and Computer Applications
         Future Generation Computer Systems Journal
 (2017) IEEE Transactions on Mobile Computing,
         IEEE Systems Journal,
         IEEE Transactions on Wireless Communications
         IEEE Wireless Communications Magazine
         ACM Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT/Ubicomp)
         Journal of Network and Computer Applications
         Future Generation Computer Systems
 (2016) IEEE Transactions on Mobile Computing,
         IEEE Systems Journal,
         IEEE Transactions on Networking,
         ACM International Conference on Mobile Computing and Networking,
         Future Generation Computer Systems,

REFERENCES   *Dr. Ramesh Govindan*
              Professor, University of Southern California
              Computer Science Department
              3710 S. McClintock Ave - RTH 412
              Los Angeles, CA 90089-2905
              Email: ramesh@usc.edu
              URL: http://cs.usc.edu/~ramesh

              Dr. Wei Hong
              VP. of Engineering, Alphabet
              (former Director of Engineering at Cisco Systems)
              Email: wei.hong@gmail.com

              Online References

              Google Scholar
              - http://scholar.google.com/citations?user=oTAOFAYAAAAJ

              ORCID
              - http://orcid.org/0000-0001-5177-4936

              ACM Digital Library
              - http://dl.acm.org/author_page.cfm?id=81320493493&coll=Portal&dl=Portal

              SCOPUS
              - https://www.scopus.com/authid/detail.uri?authorId=12789639400