

Donghyun (David) Kim

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EDUCATION

- Ph.D. in Computer Science, The University of Texas at Dallas, Richardson, Texas, USA Anticipated May 2010
GPA: 4.0/4.0 Advisors: Dr. Ding-Zhu Du and Dr. Weili Wu
- M.S. in Computer Science and Engineering, Hanyang University, Seoul, South Korea February 2005
GPA: 4.0/4.0 Advisor: Dr. Heekuck Oh
- B.S. in Electronic and Computer Engineering, Hanyang University, Ansan, South Korea February 2003

SELECTED AWARDS AND HONORS

- *Travel Expense Award* April 22 ~ 24, 2009
DIMACS/DyDAn Workshop: Approximation Algorithms Sensor Networks
- *University of Texas at Dallas Korean Alumni Scholarship* August 16, 2008
Korean Student Association at The University of Texas at Dallas
- *The Jonsson Distinguished Graduate Research Fellowship* September 2006 ~ August 2008
The University of Texas at Dallas (full tuition and fee waiver + US\$2,100/month stipend)
- *Best Paper Award* August 3, 2007
2007 International Conference on Wireless Algorithm, Systems and Applications (WASA 2007)
- *Representative Scholarship* July 2006
ELS Language Centers, USA
- *Honor/Excellence Scholarship for new graduate students* March 2003 ~ December 2004
Hanyang University, South Korea (up to 75% partial tuition and fee waiver)
- *Honor Scholarship for undergraduate students* August 2001 ~ December 2001
Hanyang University, South Korea

WORK EXPERIENCES

- Research Assistant, The University of Texas at Dallas, USA September 2009 ~ Present
- Teaching Assistant, The University of Texas at Dallas, USA June 2009 ~ August 2009
- Research Assistant, The University of Texas at Dallas, USA September 2006 ~ May 2009
- Webmaster and IT technician, INTERSTUDY KOREA, Inc., South Korea December 2005 ~ May 2006
- Research Assistant, Hanyang University, South of Korea March 2003 ~ February 2005
- Teaching Assistant, Hanyang University, South of Korea 2003 academic year
- Military service, The Ministry of National Defense, South Korea January 1998 ~ March 2000

RESEARCH INTERESTS

Wireless networks (ad-hoc networks, terrestrial and underwater sensor networks), mobile computing, distributed computing, approximation algorithm design and analysis, combinatorial optimization, social networks

MAJOR RESEARCH PROJECTS

- Computing optimal virtual backbones in wireless networks
- Network center placement problems in wireless networks
- Steiner minimum tree problems in wireless networks
- Wireless data broadcasting
- Social networks

JOURNAL PAPERS

(*: corresponding author)

In Progress

- Nguyen T Hang*, **Donghyun Kim**, Ailian Jiang, Wei Wang, and Weili Wu, “Energy Efficient Multi-hop Clustering in Wireless Sensor Networks,” in writing. (to submit to *Ad Hoc Networks*)
- **Donghyun Kim***, Yuexuan Wang, Wonjun Lee, Deying Li, Weili Wu, and Ding-Zhu Du, “Approximating Minimum d -Hop Clusterhead Placement Problems in 3-D Wireless Networks,” submitted to *IEEE Transactions on Mobile Computing (TMC)*, November 22, 2009.
- **Donghyun Kim***, Wei Wang, Changcun Ma, Nassim Sohaee, Weili Wu, and Ding-Zhu Du, “Multiple Sink Deployment in Wireless Sensor Networks for Time-Critical Applications,” submitted to *IEEE/ACM Transactions on Networking (TON)*, November 9, 2009.
- **Donghyun Kim***, Wei Wang, Nassim Sohaee, Changcun Ma, Weili Wu, and Ding-Zhu Du, “Minimum Data Latency Bound k -Sinks Placement Problem in Wireless Sensor Networks,” submitted to *IEEE/ACM Transactions on Networking (TON)*, October 30, 2009.
- Deying Li, **Donghyun Kim***, and Lin Liu, “Two Approximation Algorithms for Minimum Energy Connected Dominating Set Problem in Wireless Networks,” submitted to *IEEE Transactions on Computers (TC)*, October 10, 2009.
- **Donghyun Kim***, Wei Wang, Ling Ding, Jihwan Lim, Heekuck Oh and Weili Wu, “Minimum Average Routing Path Clustering Problem in Multi-hop 2-D Underwater Sensor Networks,” submitted to *Optimization Letters (OPTL)*, May 26, 2009. (undergoing a minor revision)
- Xiaofeng Gao*, Yi Zhu, **Donghyun Kim**, Jianzhong Li, and Weili Wu, “Optimizing Data Broadcasting in Wireless Multimedia Database Systems,” to resubmit to *IEEE Transactions on Knowledge and Data Engineering (TKDE)*. (submitted to *TKDE* on April, 2009, and recommended to revise and resubmit)
- Wei Wang*, **Donghyun Kim**, Xianyue Li, and Weili Wu, “Graphs Determined by the ϕ -Invariants,” submitted to *Discrete Mathematics*, February 15, 2009.
- **Donghyun Kim***, Zhao Zhang, Xianyue Li, Wei Wang, Weili Wu, and Ding-Zhu Du, “A Better Approximation Algorithm For Computing Connected Dominating Sets in Unit Ball Graphs,” submitted to *IEEE Transactions on Mobile Computing (TMC)*, January 2, 2009. (under 2nd review after a major revision – Reviewers’ rating: excellent[accept], good, excellent)

Published/accepted

- Xu Zhu, Jieun Yu, Wonjun Lee, **Donghyun Kim***, Shan Shan, and Ding-Zhu Du, “New Dominating Sets in Social Networks,” accepted by *Journal Of Global Optimization (JOGO)*.
- Xianyue Li*, Feng Zou, Yaochun Huang, **Donghyun Kim**, and Weili Wu, “A Better Constant-Factor Approximation for Selected-Internal Steiner Minimum Tree,” *Algorithmica*, published online.
- Changcun Ma*, **Donghyun Kim**, Yuexuan Wang, Wei Wang, Nassim Sohaee, and Weili Wu, “Hardness of k -Vertex Connected Subgraph Augmentation Problem,” *Journal of Combinatorial Optimization (JOCO)*, published online.
- Wei Wang*, **Donghyun Kim**, Nassim Sohaee, Changcun Ma, and Weili Wu, “A PTAS for Minimum d -Hop Underwater Sink Placement Problem in 2-D Underwater Sensor Networks,” *Discrete Mathematics, Algorithms and Applications (DMAA)*, vol. 1, issue 2, June 2009.
- Wei Wang*, **Donghyun Kim**, James Willson, Bhavani Thuraisingham, and Weili Wu, “A Better Approximation for Minimum Average Routing Path Clustering Problem in 2D-Underwater Sensor Networks,” *Discrete Mathematics, Algorithms and Applications (DMAA)*, vol. 1, issue 2, June 2009.
- **Donghyun Kim***, Yiwei Wu, Yingshu Li, Feng Zou, and Ding-Zhu Du, “Constructing Minimum Connected Dominating Sets with Bounded Diameters in Wireless Networks,” *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, vol. 20, no. 2, pp. 147 ~ 157, February 2009.

BOOK CHAPTERS

- Feng Zou*, **Donghyun Kim**, Xiaofeng Gao, and Ding-Zhu Du, "QoS Aware Routing in Wireless Sensor Networks," *Handbook on Sensor Networks*, World Scientific Publishing (edited by Y. Xiao, H. Chen, and F.H. Li), June 2010.
- **Donghyun Kim***, Xiaofeng Gao, Feng Zou, and Ding-Zhu Du, "Construction of Fault-Tolerant Virtual Backbones in Wireless Networks," *Handbook on Security and Networks*, World Scientific Publishing (edited by Y. Xiao, F.H. Li, and H. Chen), June 2010.
- Xiaofeng Gao*, Feng Zou, **Donghyun Kim**, and Ding-Zhu Du, "The Latest Researches on Dominating Problems in Wireless Sensor Network," *Handbook on Sensor Networks*, World Scientific Publishing (edited by Y. Xiao, H. Chen, and F.H. Li), June 2010.

CONFERENCE PAPERS

In Progress

- Xiaofeng Gao*, Yi Zhu, **Donghyun Kim**, Jianzhong Li, and Weili Wu, A New Data Broadcasting Scheme for Multimedia Database Systems, in writing. (to submit to [2010 ACM SIGMOD/PODS Conference](#))

Published/accepted

- **Donghyun Kim***, Wei Wang, Xianyue Li, Zhao Zhang, and Weili Wu, "A New Constant Factor Approximation for Computing 3-Connected m -Dominating Sets in Homogeneous Wireless Networks," accepted by [The 29th IEEE Conference on Computer Communications \(INFOCOM 2010\)](#), San Diego, California, USA, March 15-19, 2010.
- **Donghyun Kim***, Xianyue Li, Feng Zou, Zhao Zhang, and Weili Wu, "Recyclable Connected Dominating Set for Large Scale Dynamic Wireless Networks," *The 3rd International Conference on Wireless Algorithms, Systems and Applications (WASA 2008)*, Dallas, TX, USA, October 26 ~ 28, 2008.
- Feng Zou*, Xianyue Li, **Donghyun Kim**, and Weili Wu, "Construction of Minimum Connected Dominating Set in 3-Dimensional Wireless Network," *The 3rd International Conference on Wireless Algorithms, Systems and Applications (WASA 2008)*, Dallas, TX, USA, October 26 ~ 28, 2008.
- Feng Zou*, Xianyue Li, **Donghyun Kim**, and Weili Wu, "Two Constant Approximation Algorithms for Node-Weighted Steiner Tree in Unit Disk Graphs," *The 2nd Annual International Conference on Combinatorial Optimization and Applications (COCOA 2008)*, St. John's, Newfoundland, Canada, August 21 ~ 24, 2008.
- Xianyue Li*, Yaochun Huang, Feng Zou, **Donghyun Kim**, and Weili Wu, " $(1+\rho)$ -Approximation for Selected-Internal Steiner Minimum Tree," [The 14th Annual International Computing and Combinatorics Conference \(COCOON 2008\)](#), Dalian, China, June 27 ~ 29, 2008.
- **Donghyun Kim**, Sangjin Kim, and Heekuck Oh*, "A Novel Way of Issuing Multiple Private Keys in ID-based Cryptosystems," *International Conference on Convergence Information Technology (ICCIT 2007)*, Gyeongju, South Korea, November 21 ~ 23, 2007.
- Yingshu Li*, **Donghyun Kim**, Feng Zou, and Ding-Zhu Du, "Constructing Connected Dominating Sets with Bounded Diameters in Wireless Networks," *The 2nd International Conference on Wireless Algorithms, Systems and Applications (WASA 2007)*, Chicago, IL, USA, August 1 ~ 3, 2007. ([Best Paper Award](#))
- Hoonjung Lee, **Donghyun Kim**, Sangjin Kim, and Heekuck Oh*, "Identity-Based Key Agreement Protocols in a Multiple PKG Environment," *International Conference on Computational Science and Its Applications (ICCSA 2005)*, Singapore, May 9 ~ 12, 2005.

THESIS and DISSERTATION

- Ph.D. Dissertation: Efficient Management Schemes for Wireless Networks, May 2010. (anticipated)
- M.S. Thesis: A Low Cost Private Key Reissuing Model for Identity-based Cryptosystems, February 2005.

POSTER, WORKSHOP PRESENTATIONS, and INVITED TALKS

- Multiple Sink Placement Problem in 2-D Wireless Sensor Networks to Minimize Maximum Data Latency, Hanyang University, South Korea, May 25, 2009. (*invited talk*)
- Recyclable Connected Dominating Set for Large Scale Dynamic Wireless Networks, *The 3rd International Conference on Wireless Algorithms, Systems and Applications (WASA 2008)*, Dallas, TX, USA, October 26 ~ 28, 2008. (*presentation*)
- Minimum Average Routing Path Clustering Problem in Multi-hop 2-D Underwater Sensor Networks, *DIMACS/DyDan Workshop on Approximation Algorithms in Wireless Ad Hoc and Sensor Networks*, DIMACS Center, CoRE Building, Rutgers University, Piscataway, NJ, April 22 ~ 24, 2009. (*presentation*)
- Donghyun Kim and Heekuck Oh, "Hierarchical ID-Based Cryptosystem Satisfying Both Key Escrow and User Privacy," *The Ninth Conference on Communication Software (COMSW 2004)*, pp. 265 ~ 269, July 2004. (*poster*)

TEACHING EXPERIENCE

- Teaching Assistant, The University of Texas at Dallas, Richardson, Texas, USA
 - Summer 2009: Computer Networks (CS 4390), Digital Laboratory (CS 4141)
- Teaching Assistant, Hanyang University, Seoul, South Korea
 - Fall 2003: System Programming (CSE 409)
 - Spring 2003: Compiler Structure (CSE 309)
- Seminar series organizer
 - Starting from 2008, organized a seminar series on wireless networking and mobile computing and given lectures over 40 times so far
 - Seminar website: <http://theory.utdallas.edu/Seminar1.html>
- Private tutor
 - Since 2000, taught C and C++ language programming skills to several undergraduate and graduate students

GRANT PROPOSAL WRITING

National Science Foundation grant proposal draft entitled "Construction of Fault-Tolerant Underwater Sensor Networks for Time-Sensitive Applications" (for NSF 08-578, CISE Cross-Cutting Programs: FY 2009 and FY 2010), Fall 2008

PROFESSIONAL SERVICES and ACTIVITIES

- Professional memberships
 - Student Member, Institute of Electrical and Electronics Engineers (IEEE) October 2007 ~ Present
 - Student Member, Association for Computing Machinery (ACM) January 2009 ~ Present
 - Student Member, Korean-American Scientists and Engineers Association (KSEA) December 2006 ~ Present
 - Member, Toastmaster International August 2008 ~ Present
- Journal/conference paper reviewer
 - Discrete Mathematics, Algorithms and Applications (DMAA)
 - Optimization Letters (OPTL)
 - The Journal of Communications and Networks (JCN)
 - International Journal of Open Problems in Computer Science and Mathematics (IJOPCM)
 - The 2010 American Control Conference (ACC 2010)
 - The 20th International Symposium on Algorithm and Computation (ISAAC 2009)
 - The 6th IEEE International Conference on Mobile Ad-hoc and Sensor Systems (IEEE MASS 2009)
 - The 3rd International Conference on Wireless Algorithm, Systems and Applications (WASA 2008)

- Conference organizing services
 - Publicity, Webmaster, and Online Conference System (OCS) co-Chair, The 20th International Symposium on Algorithm and Computation (ISAAC 2009)
 - Publicity, Webmaster, and Online Conference System (OCS) Chair, The 3rd Annual International Conference on Combinatorial Optimization and Applications (COCOA 2009)
 - Webmaster and Local Arrangement Chair, The 3rd International Conference on Wireless Algorithm, Systems and Applications (WASA 2008)
 - Staff, The 7th Annual International Conference on Information Security and Cryptology (ICISC 2004)
 - Staff, Conference on Information Security and Cryptology (CISC W2003)
- Other services
 - Event Coordinator and Webmaster, Data Communication and Data Management Laboratory at The University of Texas at Dallas January 2008 ~ Present
 - **President** March 2009 ~ July 2009
Synergy Park Toastmasters, Toastmaster International
 - **Vice President** 2008 ~ 2009 academic year
Korean Student Association at The University of Texas at Dallas
 - Organizer September 2008 ~ December 2008
Basketball Club of Korean Student Association at The University of Texas at Dallas