Chungmok Lee, Ph.D.

Dept. of Industrial & Management Engineering,
Hankuk University of Foreign Studies,
South Korea

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Current Position

Assistant Professor, Dept. of Industrial & Management Engineering, Hankuk University of Foreign Studies, 3/2015 – present

Professional Experience

Research Staff Member, IBM Research – Ireland, Smart City Research Center, 6/2013 – 2/2015

Senior Researcher, Electronics and Telecommunications Research Institute (ETRI), 7/2011 – 6/2013

Invited Professor, Korea Advanced Institute of Science and Technology, 12/2010 – 6/2011

Visiting Scholar, Rutgers University, New Jersey, United States, Research optimization theory and applications, 2009–2010.

SW development team manager, Intellicube, Seoul, Korea, Developing logistics optimization package, 2002–2004.

SW development team manager, Koino, Daejon, Korea, Developing internet based collaboration system, 2000–2002.

Education

Korea Advanced Institute of Science and Technology, Industrial Engineering(Optimization), Ph.D., 9/2004 – 8/2009

Thesis : Robust optimization models and algorithms for the problems in telecommunications and logistics.

Brief summary : Several optimization problems in the telecommunication network and logistics subject to data uncertainty are considered. To handle the uncertainty of data efficiently, the robust optimization methodology is adopted, where the goal is to obtain a solution which is feasible for all possible realizations of input data. Formulations of the problems and exact solution algorithms for the robust solution are proposed.

Korea University, Physics(Quantum Optics), M.S., 3/1997 – 8/1999

Thesis : Research on the optical pumping of the rubidium low velocity intense source.

Korea University, Physics, B.S., 3/1993 – 2/1997

Research Interests

Theory and Methodologies of Discrete Optimization :

Linear Programming, Integer Programming, Polyhedral Theory, Cutting Plane Theory, Graph Theory and Network Programming, Branch-and-cut and Branch-and-price approaches to NP-hard problems, Robust Optimization

Applications :

Telecommunication Network Design, Logistics Planning, Supply Chain Management, Scheduling, Data Mining, etc.

Research Papers

Table: Statistics of Research Areas

Research Area	Number of papers	Research Area	Number of papers
Telecommunication	4	Logistics	3
Data Mining	5	Theory	2
Health Care	1	Robust Optimization	6
Finance	0	Social Networks	1
Stochastic	1	Military	1

Published (or Accepted) Journal Papers

[1] Jinil Han, Kyungsik Lee, **Chungmok Lee**, Ki-Seok Choi, and Sungsoo Park. Robust optimization approach for a chance-constrained binary knapsack problem. To appear in *Mathematical Programming*.
Robust Optimization   Theory

[2] Dohyun Kim, **Chungmok Lee**, Sangheum Hwang, and Myong K. Jeong. A robust support vector regression with a linear-log concave loss function. To appear in *Journal of Operational Research Society*.
Data Mining   Robust Optimization

[3] **Chungmok Lee**, Minh Pham, Norman Kim, MK Jeong, Dennis Lin, and Wanpracha Chavalitwongse. A network structural approach to the link prediction problem. *INFORMS Journal on Computing*, 27(2):249–267, 2015. Data Mining   Social Networks

[4] Chun-An Chou, Tibérius O Bonates, **Chungmok Lee**, and Wanpracha Art Chaovalitwongse. Multi-pattern generation framework for logical analysis of data. *Annals of Operations Research*, pages 1–21, 2015. Data Mining

[5] B Kawas, A Koc, M Laumanns, **Chungmok Lee**, R Marinescu, M Mevissen, N Taheri, SA van den Heever, and R Verago. Unified framework and toolkit for commerce optimization under uncertainty. *IBM Journal of Research and Development*, 58(5/6):12–1, 2014.

[6] Kyoungmi Hwang, Kyungsik Lee, **Chungmok Lee**, and Sungsoo Park. Multi-class classification using a signomial function. *Journal of Operational Research Society*, 2014. Data Mining

[7] Jinil Han, **Chungmok Lee**, and Sungsoo Park. A robust scenario approach for the vehicle routing problem with uncertain travel times. *Transportation Science*, 48(3):373–390, 2014. Robust Optimization
Logistics

[8] **Chungmok Lee**, Kyungsik Lee, and Sungsoo Park. Benders decomposition approach for the robust network design problem with flow bifurcations. *Networks*, 62(1):1–16, 2013. Robust Optimization
Telecommunication

[9] Jinil Han, Kyungsik Lee, **Chungmok Lee**, and Sungsoo Park. Exact algorithms for a bandwidth packing problem with queueing delay guarantees. *INFORMS Journal on Computing*, 25(3):583–596, 2013.
Telecommunication

[10] Zhe Liang, **Chungmok Lee**, and Wanpracha Chavalitwongse. Mathematical programming approaches for dual multicast routing problem with multilayer risk constraints. *Annals of Operations Research*, 203(1):101–118, 2013. Telecommunication

[11] **Chungmok Lee**, Kyungsik Lee, and Sungsoo Park. Robust vehicle routing problem with deadlines and travel time/demand uncertainty. *Journal of Operational Research Society*, 63(9):1294–1306, 2012.
Robust Optimization   Logistics

[12] **Chungmok Lee**, Kyungsik Lee, Kyungchul Park, and Sungsoo Park. Branch-and-price-and-cut approach for the robust network design problem without flow bifurcations. *Operations Research*, 60(3):604–610, 2012. Robust Optimization   Telecommunication

[13] **Chungmok Lee** and Sungsoo Park. Chebyshev center based column generation. ***Discrete Applied Mathematics***, 159(18):2251–2265, 2011. `Theory`

[14] Lee Yongsik, **Chungmok Lee**, and Sungsoo Park. A branch-and-price algorithm for the vehicle routing problem with time dependent travel times. ***Journal of the Korean Institute of Industrial Engineering***, 37(2):144–152, 2011. `Logistics`

[15] Young-Seon Jeong, Norman Kim, **Chungmok Lee**, and Kyungsik Lee. Remote health monitoring of parkinson's disease severity using signomial regression model. ***IE Interface***, 23(4):365–371, 2010. `Health Care` `Data Mining`

[16] Chang Yong Park, Heeso Noh, **Chungmok Lee**, and Donghyun Cho. Measurement of the zeeman-like AC stark shift. ***Physical Review A***, 63(3):032512, 2001.

Conferences and Seminars

[1] **Chungmok Lee** and Rahul Nair. Transit network design problem with uncertain demands. In ***INFORMS 2014***, 2014.

[2] **Chungmok Lee**, Nicole Taheri, and Martin Mevissen. An extreme-case scenario approach for data uncertainty. In ***IFORS 2014***, 2014.

[3] Susara van den Heever, Ban Kawas, Marco Laumanns, Radu Marinescu, **Chungmok Lee**, Nicole Taheri, Martin Mevissen, Rudi Verago, and Ali Koc. A decision support system for optimization in the face of uncertainty. In ***IFORS 2014***, 2014.

[4] **Chungmok Lee**, Minh Pham, Norman Kim, Myong K Jeong, Dennis KJ Lin, and Wanpracha Art Chavalitwongse. A novel link prediction approach for scale-free networks. In ***Proceedings of the companion publication of the 23rd international conference on World wide web companion***, pages 1333–1338. International World Wide Web Conferences Steering Committee, 2014.

[5] **Chungmok Lee**. A novel link prediction approach for scale-free networks. In ***LSNA 2014***, 2014.

[6] **Chungmok Lee**. Mathematical programming approaches for data-mining applications. In ***INRIA RealOpt Invited Seminar***, 2013.

[7] Jinil Han, **Chungmok Lee**, Kyungsik Lee, and Sungsoo Park. Exact solutions for a bandwidth packing problem with queueing delay guarantees. In ***VOCAL 2010***, 2010.

[8] Lee Yongsik, **Chungmok Lee**, and Sungsoo Park. A branch-and-price algorithm for the vehicle routing problem with time dependent travel time. In ***KIIE 2010/Fall***, 2010.

[9] **Chungmok Lee**, Minh Pham, Norman Kim, and Wanpracha Chavalitwongse. A network structural approach on the link prediction problem. In ***INFORMS 2010***, 2010.

[10] **Chungmok Lee**, Zhe Liang, and Wanpracha Chavalitwongse. A branch-and-check-and-bound algorithm for redundant multicast routing problem with shared risk link group. In ***INFORMS 2010***, 2010.

[11] Norman Kim, **Chungmok Lee**, Sangheum Hwang, MK Jeong, and Bong-Jin Yum. A robust kernel-based regression. In ***INFORMS 2010***, 2010.

[12] **Chungmok Lee**, Kyungsik Lee, Kyungchul Park, and Sungsoo Park. Branch-and-price-and-cut approach for the robust network design without flow bifurcations. In ***RUTCOR BrownBag 2010 Spring***, 2010.

[13] **Chungmok Lee** and Sungsoo Park. Chebyshev center based column generation. In ***ISMP 2009***, 2009.

[14] **Chungmok Lee** and Sungsoo Park. A new acceleration method for column generation. In ***KIIE 2009/Fall***, 2009.

[15] **Chungmok Lee**, Kyungsik Lee, Kyungchul Park, and Sungsoo Park. Algorithm for the robust network design problem with single path routing. In ***KIIE 2009/Spring***, 2009.

[16] **Chungmok Lee**, Kyungsik Lee, Kyungchul Park, and Sungsoo Park. An optimization algorithm for the path selection problem under demand uncertainty. In ***KIIE 2008/Spring***, 2008.

Industrial Projects Experience

Long-term Strategic Planning of Korea Postal Infrastructure, 2011, Korea Post, Seoul, Korea : Building Long-term Strategic Planning of Domestic Transportation Network

Algorithm Framework for Robust Optimization Problems using Decomposition, 2009, National Research Foundation, Daejon, Korea : Research of Robust Optimization Approach using Decomposition Methods

Optimization Algorithms for the Network Design Problem under Demand Uncertainty, 2008, National Research Foundation, Daejon, Korea : Research of New Optimization Methodology for Network Design Problem with Demand Uncertainty

Train Car Allocation and Routing Optimization Engine Development, 2008, KORAIL, Daejon, Korea : Design and Developing Train Car Operation Optimization Engine

Developing nanoRTS system, 2008, LG Display, Seoul, Korea : Design and Developing LCD Manufacturing Scheduling Engine

Process Equipment Allocation System Development, 2007, Samsung Electronics, Hwasung, Korea : Design and Developing Semiconductor Manufacturing Equipment Job Allocation Optimization Engine

GIS/GPS based Logistic Management System, 2007, IntelliCube, Seoul, Korea : Design and Developing Logistic Optimization Engine

K-POWER IDSS Optimization Engine Development, 2006, K-Power, Seoul, Korea : Design and Developing Power Plant Generation Planning Optimization Engine

Real Time Scheduler for Semiconductor Manufacturing, 2006, Hynix, Seoul, Korea : Design and Developing Semiconductor Manufacturing Scheduler

Honors and Awards

Young Management Scientist Award, Korean Operations Management Science Society, 2014

Research Division Award, IBM, 2014

Beak-Am Technology Award, Korean Institute of Industrial Engineers, 2011.

IT Skills

I am very fluent in using :
C, C++, C#, Python, .NET, Java, Matlab, R, Fortran, EJB, SQL, Cplex, XPress-MP, LaTeX

References

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