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Research Fellow ◇ School of Elec. Eng., Comp. and Math. Sci. ◇ Curtin University
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Education

Korea University

Ph.D. in Computer Science and Engineering

· Advisor: Prof. Yon Dohn Chung

Seoul, South Korea

MAR. 2014 - AUG. 2019

Korea University

B.E. in Electronics and Information Engineering

· On leave: SEP. 2008 - FEB. 2011, Military Service

Sejong, South Korea

MAR. 2007 - FEB. 2014

Professional Experiences

Department of Electrical and Computer Engineering at Curtin University

Research Fellow

Research Associate

- Project 3: A Bayesian approach to distributed estimation for multi-object systems
- Project 2: An intelligent system for crime analysis and prevention based on multi-object tracking and situational awareness
- Project 1: A data-driven system for privacy-preserving pandemic prevention

Perth, Australia

Nov. 2022 - Present

Nov. 2019 - Nov. 2022

Database Laboratory at Korea University

Research Assistant

- Project 3: A research on safe and convenient big data processing methods
- Project 2: A research on privacy issues and privacy protection methods for social network services
- Project 1: An intelligent system for crime detection/prevention and public security based on CCTV bigdata

Seoul, South Korea

MAR. 2014 - AUG. 2019

School of Engineering at RMIT University

Visiting Student (Host: Dr. Du Yong Kim)

- Project: A research on random finite set approach to database applications

Melbourne, Australia

JAN. 2019 - FEB. 2019

Korea Institute of Science and Technology Information (KISTI)

Student Researcher

- Project: Research on analysis and application platform technologies for science and technology big data

Daejeon, South Korea

JUL. 2013 - FEB. 2014

Honors and Awards

- NOV. 2022 Best Paper Award, Int. Conf. Cont., Auto. and Inf. Sci. (ICCAIS)
- OCT. 2021 Best Paper Award (First Runner-Up), Int. Conf. Cont., Auto. and Inf. Sci. (ICCAIS)
- SEP. 2020 Postdoctoral Fellowship (Nurturing Next-generation Researchers), National Research Foundation of Korea
- FEB. 2019 KU Graduate Student Achievement Award, Korea University, Korea University
- JUL. 2018 Student Paper Contest Award, Korea Computer Congress (KCC), Korea Computer Congress (KCC)
- OCT. 2017 Honorable Mention Award, IEEE Visual Analytics Science and Technology (VAST Challenge)
- MAY 2015 Outstanding Paper Award, Korean DataBase Conference (KDBC)

Research Interests

Data Management, Data Mining, Signal Processing, and Machine Learning

- Query Processing, Spatio-Temporal, Graph Algorithms, and Visual Analytics
- Bayesian Learning, Multi-Object Tracking, Graph Neural Networks, and Anomaly Detection

Publications

† equal contribution, * corresponding author

International Journals

- J11** **Changbeom Shim**, Ba-Tuong Vo, Ba-Ngu Vo, Jonah Ong, and Diluka Moratuwage
“Linear Complexity Gibbs Sampling for Generalized Labeled Multi-Bernoulli Filtering”
IEEE Transactions on Signal Processing, Vol 71: 1981-1994, May 2023
- J10** **Changbeom Shim**, Wooil Kim, Tran Thien Dat Nguyen, Du Yong Kim, Yu Suk Choi, and Yon Dohn Chung
“CellTrackVis: interactive browser-based visualization for analyzing cell trajectories and lineages”
BMC Bioinformatics, Vol 24: 124, Mar. 2023
- J9** Diluka Moratuwage, Ba-Ngu Vo, Ba-Tuong Vo, and **Changbeom Shim**
“Multi-Sensor Multi-Scan Multi-Object State Estimation”
IEEE Transactions on Signal Processing, Vol 70: 5429-5442, Oct. 2022
- J8** Cong-Thanh Do, Tran Thien Dat Nguyen, Diluka Moratuwage, **Changbeom Shim**, and Yon Dohn Chung
“Multi-object tracking with an adaptive generalized labeled multi-Bernoulli filter”
Signal Processing, Vol 196: 108532, Jul. 2022
- J7** Jonah Ong, Ba Tuong Vo, Sven Nordholm, Ba-Ngu Vo, Diluka Moratuwage, and **Changbeom Shim**
“Audio-Visual Based Online Multi-Source Separation”
IEEE/ACM Transactions on Audio, Speech, and Language Processing, Vol 30: 1219-1234, Mar. 2022
- J6** Wooil Kim, **Changbeom Shim**, and Yon Dohn Chung
“SkyFlow: A visual analysis of high-dimensional skylines in time-series”
Journal of Visualization, Vol 24(5): 1033-1050, May 2021
- J5** **Changbeom Shim**, Gyuhyeon Sim, and Yon Dohn Chung
“Cohesive Ridesharing Group Queries in Geo-Social Networks”
IEEE Access, Vol 8: 97418-97436, May 2020
- J4** Wooil Kim, **Changbeom Shim**, Wan Heo, Sungmin Yi, and Yon Dohn Chung
“Moving view field nearest neighbor queries”
Data & Knowledge Engineering, Vol 119: 58-70, Jan. 2019
- J3** **Changbeom Shim**, Wooil Kim, Wan Heo, Sungmin Yi, and Yon Dohn Chung
“Nearest close friend search in geo-social networks”
Information Sciences, Vol 423: 235-256, Jan. 2018
- J2** Sungmin Yi, **Changbeom Shim**, and Yon Dohn Chung
“Reverse View Field Nearest Neighbor Queries”
Information Sciences, Vol 402: 35-49, Sep. 2017
- J1** **Changbeom Shim**, Wooil Kim, Wan Heo, Sungmin Yi, and Yon Dohn Chung
“ ℓ -Close Range Friends Query on Social Grid Index”
IEICE Transaction on Information and Systems, Vol 100-D(4): 811-812, Apr. 2017

International Conferences

- C5** **Changbeom Shim**, Ji Youn Lee, Diluka Moratuwage, Du Yong Kim, and Yon Dohn Chung
“Generalized Label Grouping for Scalable Trajectory Estimation”
11th International Conference on Control, Automation and Information Sciences (ICCAIS), Nov. 2022
- C4** Diluka Moratuwage, **Changbeom Shim**, and Yuthika Punchihewa
“A Moving Window Based Approach to Multi-Scan Multi-Target Tracking”, **Best Paper Award**
11th International Conference on Control, Automation and Information Sciences (ICCAIS), Nov. 2022
- C3** **Changbeom Shim**, and Du Yong Kim
“Space-oriented Label Partitioning for Multi-object Tracking”, **Best Paper Award (First Runner-Up)**
10th International Conference on Control, Automation and Information Sciences (ICCAIS), Oct. 2021
- C2** Tran Thien Dat Nguyen, **Changbeom Shim***, and Wooil Kim
“Biological Cell Tracking and Lineage Inference Via Random Finite Sets”
18th IEEE International Symposium on Biomedical Imaging (ISBI), Apr. 2021
- C1** Wooil Kim, **Changbeom Shim**, Ilhyun Suh, and Yon Dohn Chung
“A Visual Explorer for Analyzing Trajectory Patterns”, **Honorable Mention Award (Challenge)**
12th IEEE Conference on Visual Analytics Science and Technology (VAST), Oct. 2017

Patents

- P2** Yon Dohn Chung, **Changbeom Shim**, and Wooil Kim
“Device for searching nearest close friends”
Oct. 2020, Korea Registration Number: 10-2172236
- P1** Yon Dohn Chung, and **Changbeom Shim**
“Device and method for recommending ride sharing group, recording medium for performing the method”
Jan. 2020, Korea Registration Number: 10-2064376

Supervisions

Ji Youn Lee Ph.D. student from Jun. 2022 under my co-supervision with Prof. Ba Tuong Vo and Prof. Ba-Ngu Vo

Teaching Experiences

Lecturer at Korea University, Seoul, South Korea

FALL 2018 COSE214: Algorithm

Teaching Assistant at Korea University, Seoul, South Korea

FALL 2017 COSE156: Python Programming

SPRING 2016 COSE213: Data Structure

FALL 2015 COSE242: Data Communication

FALL 2014 COSE102: Computer Programming

References

References are available upon request.