Changbeom Shim, Ph.D.

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

4.14, New Technologies Bld. (314) ⋄ Kent St, Bentley ⋄ Western Australia, 6102, Australia

http://scbeom.github.io/main ⋄ changbeom.shim@curtin.edu.au

Education

Korea University	*Seoul, South Korea*
Ph.D. in Computer Science and Engineering	Mar. 2014 - Aug. 2019

· Advisor: Prof. Yon Dohn Chung

Korea University	*Sejong, South Korea*
B.E. in Electronics and Information Engineering	Mar. 2007 - Feb. 2014

· On leave: Sep. 2008 - Feb. 2011, Military Service

Professional Experiences

Department of Electrical and Computer Engineering at Curtin University	*Perth, Australia*
Research Fellow	Nov. 2022 - Present
Research Associate	Nov. 2019 - Nov. 2022

· Project 4: A Bayesian approach to distributed estimation for multi-object systems
· Project 3: An intelligent system for crime analysis and prevention based on multi-object tracking and situational awareness
· Project 2: A data-driven system for privacy-preserving pandemic prevention
· Project 1: Efficient implementations of large-scale multi-object tracking

Database Laboratory at Korea University	*Seoul, South Korea*
Research Assistant	Mar. 2014 - Aug. 2019

· 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

School of Engineering at RMIT University	*Melbourne, Australia*
Visiting Student of Dr. Du Yong Kim	Jan. 2019 - Feb. 2019

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

Korea Institute of Science and Technology Information (KISTI)	*Daejeon, South Korea*
Student Researcher	Jul. 2013 - Feb. 2014

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

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 Program, National Research Foundation (NRF) of Korea
Feb. 2019	KU Graduate Student Achievement Award, Korea University
Jul. 2018	Student Paper Contest Award, Korea Computer Congress (KCC)
Feb. 2018	Outstanding Ph.D. Candidate Paper Award, Korea University
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

Technical Reports (Preprint / Under Review)

R1 **Changbeom Shim**, Ba Tuong Vo, Ba-Ngu Vo, Jonah Ong, and Diluka Moratuwage
"Linear Complexity Gibbs Sampling for Generalized Labeled Multi-Bernoulli Filtering"
arXiv preprint arXiv:2211.16041, Nov. 2022

International Journals

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"
11$^{\text{th}}$ 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**
11$^{\text{th}}$ 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)**
10$^{\text{th}}$ 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"
18$^{\text{th}}$ 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)**
12$^{\text{th}}$ 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

Technical Experiences

Computer Languages	Java, Matlab, Python
Others	PostgreSQL, MySQL, Hadoop

References

References are available upon request.