

Kijung SHIN

CONTACT INFORMATION CHiPS (N26), Room #114 Phone: +82 - 42 - 350 - 7454
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RESEARCH INTERESTS Data Mining, Graph Mining, Social Network Analysis, Scalable Machine Learning

EDUCATION **Carnegie Mellon University**, Pittsburgh, PA, USA 08/2015 - 02/2019
Ph.D. in Computer Science
Thesis: “Mining Large Dynamic Graphs and Tensors”
Advisor: Prof. Christos Faloutsos

Seoul National University, Seoul, Korea 03/2008 - 08/2015
B.S. in Computer Science & Engineering; and B.A. in Economics
Thesis: “Scalable Methods for Random Walk with Restart and Tensor Factorization”
Advisors: Prof. U Kang and Prof. Byung-Gon Chun
GPA: 4.21/4.30 (Ranked 1st in the College of Engineering)

POSITIONS **KAIST**, Daejeon, Korea 02/2019 - Present
Assistant Professor, Graduate School of AI & School of Electrical Engineering

LinkedIn Corporation, Mountain View, CA, USA 05/2018 - 08/2018
Research Intern, Growth Relevance Team
Project: “Lossless and Lossy Summarization of Web-Scale Graphs”
Mentors: Dr. Amol Ghoting and Dr. Myunghwan Kim

LinkedIn Corporation, Mountain View, CA, USA 05/2017 - 08/2017
Research Intern, Growth Relevance Team
Project: “Discovering Progression Stages in Trillion-Scale Behavior Logs”
Mentors: Dr. Mahdi Shafiei and Dr. Myunghwan Kim

CYRAM, Seoul, Korea 01/2011 - 12/2013
Associate Researcher
Projects: NetMiner 4 (social network analysis software), NetExplorer 3 (criminal analysis software), and Sopion.com (Twitter analysis and monitoring service)

AWARDS & HONORS Awarded the **Siebel Scholar Fellowship** 08/2018
Selected for **Best Papers of ICDM 2016** and Invited to the KAIS Journal 12/2016
Received the **SIGKDD Best Research Paper Award** 08/2016
Awarded the **Korea Foundation for Advanced Studies Scholarship** 2015 - 2019
Received the **Best Senior Thesis Award**, Seoul National University 08/2015
Received the **Samsung Humantech Paper Award** (1st in CS) 02/2015
Awarded the **Kwanjeong Educational Foundation Scholarship** 2010, 2014, 2015
Awarded the **Merit-Based Scholarship**, Seoul National University 2009
Awarded the **National Science & Technology Scholarship** 2008

THESES [1] Mining Large Dynamic Graphs and Tensors
 [Kijung Shin](#)
 Ph.D. Thesis, Carnegie Mellon University, 2019.

 [2] Scalable Methods for Random Walk with Restart and Tensor Factorization
 [Kijung Shin](#)
 Senior Thesis, Seoul National University, 2015. (*Best Senior Thesis Award*)

- REFERRED
CONFERENCE
& JOURNAL
PAPERS
- [3] How Much and When Do We Need Higher-order Information in Hypergraphs?
A Case Study on Hyperedge Prediction
Se-eun Yoon, Hyungseok Song, [Kijung Shin](#), and Yung Yi
TheWebConf 2020 (formerly WWW) (Short Paper)
 - [4] TellTail: Fast Scoring and Detection of Dense Subgraphs
Bryan Hooi, [Kijung Shin](#), Hemank Lamba, and Christos Faloutsos
AAAI 2020 (*Oral Presentation*)
 - [5] MIDAS: Microcluster-Based Detector of Anomalies in Edge Streams
Siddharth Bhatia, Bryan Hooi, Minji Yoon, [Kijung Shin](#), and Christos Faloutsos
AAAI 2020 (*Oral Presentation*)
 - [6] Fast and Memory-Efficient Algorithms for High-Order Tucker Decomposition
Jiyuan Zhang, Jinoh Oh, [Kijung Shin](#), Evangelos E. Papalexakis,
Christos Faloutsos, and Hwanjo Yu
KAIS 2020 (Journal)
 - [7] Fast, Accurate and Provable Triangle Counting in Fully Dynamic Graph Streams
[Kijung Shin](#), Sejoon Oh, Jisu Kim, Bryan Hooi, and Christos Faloutsos
ACM TKDD 2020 (Journal)
 - [8] Fast and Accurate Anomaly Detection in Dynamic Graphs with a Two-Pronged Approach
Minji Yoon, Bryan Hooi, [Kijung Shin](#), and Christos Faloutsos
ACM KDD 2019
 - [9] SWeG: Lossless and Lossy Summarization of Web-Scale Graphs
[Kijung Shin](#), Amol Ghoting, Myunghwan Kim and Hema Raghavan
TheWebConf 2019 (formerly WWW)
 - [10] SMF: Drift Aware Matrix Factorization with Seasonal Patterns
Bryan Hooi, [Kijung Shin](#), Shenghua Liu, and Christos Faloutsos
SDM 2019
 - [11] Think Before You Discard: Accurate Triangle Counting in Graph Streams with Deletions
[Kijung Shin](#), Jisu Kim, Bryan Hooi, and Christos Faloutsos
PKDD 2018
 - [12] ONE-M: Modeling the Co-evolution of Opinions and Network Connections
Aastha Nigam, [Kijung Shin](#), Ashwin Bahulkar, Bryan Hooi, David Hachen,
Boleslaw Szymanski, Christos Faloutsos, and Nitesh Chawla
PKDD 2018
 - [13] Discovering Progression Stages in Trillion-Scale Behavior Logs
[Kijung Shin](#), Mahdi Shafiei, Myunghwan Kim, Aastha Jain, and Hema Raghavan
TheWebConf 2018 (formerly WWW) (Industry Track)
 - [14] Tri-Fly: Distributed Estimation of Global and Local Triangle Counts in Graph Streams
[Kijung Shin](#), Mohammad Hammoud, Euiwoong Lee, Jinoh Oh, and Christos Faloutsos
PAKDD 2018
 - [15] Fast, Accurate and Flexible Algorithms for Dense Subtensor Mining
[Kijung Shin](#), Bryan Hooi, and Christos Faloutsos
ACM TKDD 2018 (Journal)
 - [16] Patterns and Anomalies in k-Cores of Real-world Graphs with Applications
[Kijung Shin](#), Tina Eliassi-Rad, and Christos Faloutsos
KAIS 2018 (Journal) (*Special Issue on the Selected Papers from ICDM 2016*)

- [17] WRS: Waiting Room Sampling for Accurate Triangle Counting in Real Graph Streams
Kijung Shin
IEEE ICDM 2017
- [18] ZooRank: Ranking Suspicious Entities in Time-Evolving Tensors
Hemank Lamba, Bryan Hooi, Kijung Shin, Christos Faloutsos, and Jürgen Pfeffer
PKDD 2017
- [19] DenseAlert: Incremental Dense-Subtensor Detection in Tensor Streams
Kijung Shin, Bryan Hooi, Jisu Kim, and Christos Faloutsos
ACM KDD 2017
- [20] Why You Should Charge Your Friends for Borrowing Your Stuff
Kijung Shin, Euiwoong Lee, Dhivya Eswaran, and Ariel D. Procaccia
IJCAI 2017 (*Featured in New Scientist*)
- [21] D-Cube: Dense-Block Detection in Terabyte-Scale Tensors
Kijung Shin, Bryan Hooi, Jisu Kim, and Christos Faloutsos
ACM WSDM 2017 (*SIGIR Student Travel Grant*)
- [22] S-HOT: Scalable High-Order Tucker Decomposition
Jinoh Oh, Kijung Shin, Evangelos E. Papalexakis, Christos Faloutsos, and Hwanjo Yu
ACM WSDM 2017
- [23] Graph-Based Fraud Detection in the Face of Camouflage
Bryan Hooi, Kijung Shin, Hyun Ah Song, Alex Beutel, Neil Shah, and Christos Faloutsos
ACM TKDD 2017 (Journal) (*Special Issue on the Best Papers from KDD 2016*)
- [24] Fully Scalable Methods for Distributed Tensor Factorization
Kijung Shin, Lee Sael, and U Kang
IEEE TKDE 2017 (Journal)
- [25] CoreScope: Graph Mining Using k-Core Analysis - Patterns, Anomalies and Algorithms
Kijung Shin, Tina Eliassi-Rad, and Christos Faloutsos
IEEE ICDM 2016
(*Selected for Best Papers of ICDM 2016 and Invited to the KAIS Journal*)
- [26] M-Zoom: Fast Dense-Block Detection in Tensors with Quality Guarantees
Kijung Shin, Bryan Hooi, and Christos Faloutsos
PKDD 2016
- [27] FRAUDAR: Bounding Graph Fraud in the Face of Camouflage
Bryan Hooi, Hyun Ah Song, Alex Beutel, Neil Shah, Kijung Shin, and Christos Faloutsos
ACM KDD 2016 (*SIGKDD Best Research Paper Award*)
- [28] Random Walk with Restart on Large Graphs Using Block Elimination
Jinhong Jung, Kijung Shin, Lee Sael, and U Kang
ACM TODS 2016 (Journal)
- [29] BEAR: Block Elimination Approach for Random Walk with Restart on Large Graphs
Kijung Shin, Jinhong Jung, Lee Sael, and U Kang
ACM SIGMOD 2015
(*Samsung Humantech Paper Award, SIGMOD Student Travel Award*)
- [30] Distributed Methods for High-dimensional and Large-scale Tensor Factorization
Kijung Shin and U Kang
IEEE ICDM 2014 (*ICDM Student Travel Award*)
- [31] Data/Feature Distributed Stochastic Coordinate Descent for Logistic Regression
Dongyeop Kang, Woosang Lim, Kijung Shin, Lee Sael, and U Kang
ACM CIKM 2014

TECHNICAL REPORTS	[32] CoCoS: Fast and Accurate Distributed Triangle Counting in Graph Streams <u>Kijung Shin</u> , Euiwoong Lee, Jinoh Oh, Mohammad Hammoud, and Christos Faloutsos Technical Report 2019	
	[33] Out-of-Core and Distributed Algorithms for Dense Subtensor Mining <u>Kijung Shin</u> , Bryan Hooi, Jisu Kim, and Christos Faloutsos Technical Report 2018	
OTHERS	[34] Detecting Communities and Anomalies in Large Real-world Graphs Sungsu Lim and <u>Kijung Shin</u> IEEE BigComp 2020 (Tutorial)	
	[35] Patterns and Anomalies in k-Cores of Real-world Networks <u>Kijung Shin</u> , Tina Eliassi-Rad, and Christos Faloutsos NetSci 2017 (Abstract)	
	[36] Incorporating Side Information in Tensor Completion Hemank Lamba, Vaishnavh Nagarajan, <u>Kijung Shin</u> , and Naji Shajarisales WWW Companion 2016 (Poster)	
TEACHING	Instructor	
	KAIST AI506 Data Mining and Search	Spring 2020
	KAIST AI607 Graph Mining and Social Network Analysis	Fall 2019
	KAIST EE209(B) Programming Structures for Electrical Engineering	Spring 2019
	Teaching Assistant	
	CMU 10-601 Introduction to Machine Learning	Fall 2017
CMU 15-780 Graduate Artificial Intelligence	Spring 2017	
	Guest Lecturer	
	CMU 10-405 Machine Learning with Large Datasets	Spring 2018
CURRENT STUDENTS	Ph.D. Students	
	Dongjin Lee, KAIST EE	Fall 2019 -
	Hyeonsoo Jo, KAIST AI	Fall 2019 -
	Master Students	
	Se-eun Yoon, KAIST EE (Co-advisor: Prof. Yung Yi)	Spring 2019 -
	Manh Tuan Do, KAIST EE	Fall 2019 -
	Jihoon Ko, KAIST AI	Fall 2019 -
	Inkyu Park, KAIST AI	Fall 2019 -
	Hyeonju Lee, KAIST AI	Fall 2019 -
	Gwenevere Kay Gutierrez, KAIST EE (Co-advisor: Prof. Yung Yi)	Winter 2019 -
	Hyunjin Hwang, KAIST EE	Spring 2020 -
	Kyuhan Lee, KAIST AI	Spring 2020 -
	Seungwoo Lee, KAIST AI	Spring 2020 -
	Taehyung Kwon, KAIST AI	Spring 2020 -
	Research Staffs	
	Geon Lee	Winter 2019 -
	Woonsung Baek	Fall 2019 -
	Undergraduates	
	Yewon Eliana Kim, KAIST EE (URP Program)	Fall 2019 -

FORMER STUDENTS	Undergraduates	
	Gungyu Lee, KAIST EE (Individual Research Program)	Winter 2019
	Hyeon Jeong Shin, KAIST EE (Individual Research Program)	Winter 2019
	Jaehan Cho, KAIST EE (Individual Research Program)	Winter 2019
	Hyunjin Hwang, KAIST EE (URP Program)	Summer 2019 - Winter 2019
	Taehyung Kwon, KAIST CS (Individual Research Program)	Summer 2019 - Winter 2019
	Seungwoo Lee, KAIST CS (Individual Research Program)	Summer 2019 - Winter 2019
	Yunbum Kook, KAIST Math (URP Program)	Spring 2019 - Fall 2019
	Seunghyuk Oh, KAIST EE (Individual Research Program)	Summer 2019
	Minkyoo Song, KAIST ISysE (Individual Research Program)	Summer 2019
	Manh Tuan Do, KAIST EE	Spring 2019 - Summer 2019
	Jihoon Ko, KAIST CS	Spring 2019 - Summer 2019
	Jung Uk Yim, KAIST EE (Graduate Research Program)	Spring 2019
	Visiting Students	
	Minyoung Choe, Sogang Univ. CSE	Spring 2020 -
Kyuhan Lee, Hanyang Univ. CS	Summer 2019 - Winter 2019	
Shaurya Goel, IIT Delhi Math (VSR Program)	Summer 2019	
SERVICES	Program Committee Member (Major Conferences)	
	ACM KDD	2019 - 2020
	The Web Conference (formerly WWW)	2019 - 2020
	IEEE ICDM	2019 - 2020
	NeurIPS (as a Reviewer)	2019 - 2020
	Program Committee Member (Others)	
	DASFAA	2020
	Doctoral Consortium @ ACM WSDM	2020
	IDEA Workshop @ ACM KDD	2018
	Journal Reviewer	
	The VLDB Journal	2019
	ACM Transactions on Knowledge Discovery from Data (TKDD)	2019
	IEEE Transactions on Knowledge and Data Engineering (TKDE)	2018 - 2020
	Physica A: Statistical Mechanics and its Applications	2018
	IEEE Signal Processing Letters (SPL)	2017
IEEE/ACM Transactions on Networking (ToN)	2017	
PhD Committee Member		
Wondeuk Yoon, KAIST CS (Advisor: Prof. Daeyoung Kim)	01/2020 (Proposal)	
Seungjae Lee, KAIST EE (Advisor: Prof. Chang D. Yoo)	11/2019 (Defense)	
Hyeontaek Oh, KAIST EE (Advisor: Prof. Jun Kyun Choi)	11/2019 (Defense)	
MS Committee Member		
Geon Heo, KAIST EE (Advisor: Steven Euijong Whang)	12/2019	
Junhyeok Kang, KAIST ISysE (Advisor: Jae-Gil Lee)	12/2019	
Yu Yao, KAIST ISysE (Advisor: Jae-Gil Lee)	12/2019	