



IDEaS Seminar Series

Mining of Real-world Hypergraphs: Patterns, Tools, and Generators

**Featuring Kijung Shin | Ewon Endowed Assistant Professor;
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CODA Building 9th Floor Atrium**

Abstract: Group interactions are prevalent in various complex systems (e.g., collaborations of researchers and group discussions on online Q&A sites), and they are commonly modeled as hypergraphs. Hyperedges, which compose a hypergraph, are non-empty subsets of any number of nodes, and thus each hyperedge naturally represents a group interaction among entities. The higher-order nature of hypergraphs brings about unique structural properties that have not been considered in ordinary pairwise graphs. In this talk, I'll offer a comprehensive overview of a new research topic called hypergraph mining. First, I'll present recently revealed structural properties of real-world hypergraphs, including (a) static and dynamic patterns, (b) global and local patterns, and (c) connectivity and overlapping patterns. Together with the patterns, I'll introduce advanced data mining tools used for their discovery. Lastly, I'll describe simple yet realistic hypergraph generative models that provide an explanation of the structural properties

Bio: Kijung Shin is an Ewon Endowed Assistant Professor (jointly affiliated) in the Kim Jaechul Graduate School of AI and the School of Electrical Engineering at KAIST. He received his Ph.D. from the Computer Science Department at Carnegie Mellon University in 2019. He has published more than 50 referred articles in major data mining venues, including KDD, WWW, and ICDM, and he won the best research paper award at KDD 2016. His research interests span a wide range of topics on graph mining, with a focus on scalable algorithm design and empirical analysis of real-world hypergraphs.