Faculty Candidate Seminar

Distributed Computing on Large Graphs

Dr. Peter Robinson
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Abstract: Motivated by the increasing need for fast distributed processing of large graphs such as the Web graph, biological networks and various social networks, we study fundamental graph problems in the distributed message-passing model, where we have k machines that jointly perform computation on an arbitrary n-node input graph (typically, n is much larger than k). The graph is assumed to be randomly partitioned among the k machines, which is a common implementation in many real world systems. We quantify the fundamental limitations of solving graph problems in a distributed system by giving complexity lower bounds. To complement our lower bounds, we show how problems such as verifying graph connectivity and computing the PageRank can be solved efficiently in this model. We also discuss how our model relates to practical distributed systems for graph processing such as Google Pregel and Apache Giraph.

Bio: Dr. Peter Robinson is a Lecturer (Assistant Professor) at Royal Holloway, University of London.

He obtained his PhD from the Vienna University of Technology and spent several years as a postdoctoral researcher at the National University of Singapore. His research interests are in the area of distributed computing. In particular, he is interested in distributed and parallel algorithms, big data processing, and fault-tolerance in dynamic communication networks such as peer-to-peer systems. He has coauthored over 30 papers in international conferences and journals and his work has received two Best Paper Awards. He will serve as the General Chair of ACM PODC 2019.

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Time: 1:00 pm

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