SEMANTIC AND STATISTICAL ANALYSIS BASED FRAMEWORK FOR INTRACRANIAL ANEURYSM KNOWLEDGE CURATION

The Oakland University and School of Engineering and Computer Science communities are invited to attend Madan Krishnamurthy's defense of his Ph.D. dissertation. Seating is limited. RSVP with Katie Loodeen at loodeen@oakland.edu.

SEMANTIC AND STATISTICAL ANALYSIS BASED FRAMEWORK FOR INTRACRANIAL ANEURYSM KNOWLEDGE CURATION

Committee: Khalid M. Malik, Ph.D. (Chair), Mohammad Siadat, Ph.D., Erik Fredericks, Ph.D., Joshua Dehlinger, Ph.D.

Time: **11:00 a.m. – 1:00 p.m.**
Date: **Friday, July 12, 2019**
Location: **347 EC**

Digitization of healthcare has resulted in large volumes of data, that can be tapped to derive meaningful insights for clinical decision making. It is important to refine this unstructured data and convert it into machine-readable structured knowledge graph. Knowledge curation can extract actionable information to understand about unknown risk factors, natural history of complex diseases and effectiveness of different treatments. Current knowledge graph curation mostly rely on manual, labor-intensive processes which can be extremely challenging when dealing with larger dataset, hence calling for automation. The use of knowledge graph along with machine learning in clinical decision support systems (CDSS) is expected to revolutionize the future of healthcare.

A knowledge framework doesn't currently exist for intracranial aneurysm (IA) diagnosis and treatment, and this gap must be addressed owing to the growing population of individuals the condition is affecting. Intracranial aneurysm poses real diagnostic challenges to both patients and caregivers due to the unpredictable nature of the disease, its onset and progression to life-threatening rupture. This thesis proposes a novel knowledge curation framework that organizes and integrates structured and unstructured IA data into conceptual knowledge graph by employing Natural Language Processing (NLP), statistics and machine learning concepts to perform knowledge extraction, discovery and representation that can aide in early detection of IA and identifying high-risk factors that contribute towards aneurysm rupture (subarachnoid hemorrhage).