COMPUTER SCIENCE & ENGINEERING
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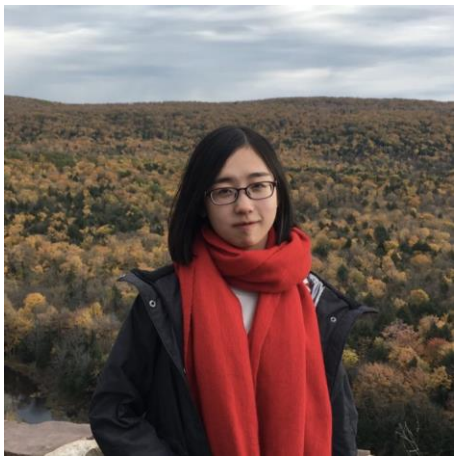
DISSERTATION DEFENSE



Wenjia He

Towards Query Processing in Video Database Management Systems

Thursday, January 18, 2024
9:00am – 11:00am
Virtual - Zoom

ABSTRACT: Videos have been widely adopted across various applications, highlighting the increasing importance of database management systems that can support video queries. However, achieving effective query processing in video database management systems is challenging due to factors such as the substantial size of video databases and the unstructured nature of video content. To address these challenges, I demonstrate that algorithm support is essential for query processing in the video database management systems, especially for accelerating the process of video selection queries, balancing competing requirements in aggregate queries for video analytics, and supporting causality queries. To support this statement, my dissertation focuses on four key parts: (1) building a new indexing mechanism that captures visual similarity for filtering items that are likely to satisfy the query predicate, (2) developing a video degradation-accuracy profiling system, helping administrators to choose an appropriate degradation setting for competing requirement trade-off in video analytics, (3) proposing a commonsense knowledge-enhanced indexing method, which initially constructs a lossy but inexpensive index and subsequently patches it to quickly identify query result candidates, and (4) implementing a causal inference system that uncovers confounding variables within images to solve confounding bias and compute more accurate average treatment effects (ATE).

CHAIR: Prof. H.V. Jagadish and Principal Research Scientist Michael Cafarella