

## Invited Talk

Monday, October 2<sup>nd</sup> | 1:30PM | BYAC 150

### Beating human in cognition: a case study on Microsoft Academic

#### Kuansan Wang

Principal researcher  
and managing  
director of Microsoft  
Research Outreach



#### Abstract

Cognition is defined as the "process of acquiring knowledge and understanding through thought, experience, and the senses," and often "encompasses processes such as knowledge, attention, memory, judgment, evaluation, reasoning and computation." Based on this definition, humans appear destined to be surpassed by machines that are equipped with massive memory with perfect recall, can remain attentive with perpetual endurance, and can exercise judgments and reasoning by executing logical or numerical computations in a much faster and precise fashion. With massive amount of data and computation powers, machine has made great strides in exhibiting intelligent behaviors. Has it beaten human in acquiring and utilizing knowledge yet? In this talk, we will describe Microsoft Academic, a research project to create a cognitive agent that can be simultaneously proficient in more than 50,000 fields of study by reading over more than a century's worth of scholarly publications from the web. At its core is a virtuous cycle based on reinforcement learning where the machine is aided by a knowledge graph to extract salient entities and their relationships from publications, and these entities and relationships are then fed back to the knowledge graph to enrich its coverage and further improve the machine reading capabilities. We will show how the cognitive agent, currently at age two, can be publicly accessed, and how the knowledge accumulated has played a role in our daily activities inside Microsoft Research.

#### Biography

Kuansan Wang is a principal researcher and managing director of Microsoft Research Outreach where he is responsible for engaging with the global academic community on jointly advancing the state-of-the-art in the areas MSR conducts research. He is leading a team that conducts research on web-scale machine reading, intelligent inference, deep semantic analytics and user behavior modeling. In addition to contributing to the development of Microsoft Bing and Cortana, the technologies developed at his team can also be seen in Microsoft Academic services that include a search engine at [academic.microsoft.com](http://academic.microsoft.com) and the Academic Knowledge API available through Microsoft Cognitive Services. Dr. Wang joined MSR in 1998 as a researcher in speech technology group where he conducted research in language modeling and multimodal interactions. He then became a software architect for Microsoft speech product group, responsible for Microsoft Speech Server and Response Point, and represented Microsoft to W3C, ECMA and ISO to help author international standards in speech, language and communication areas. He returned to MSR to work on web search in 2007 and has been a key driving force to evolve web search from a keyword based to semantic based paradigm. Kuansan received his BS from National Taiwan University and MS and PhD as an NSF Fellow from University of Maryland, College Park, all in electrical engineering.

Hosted by: Huan Liu