Cognitive Computing Journey

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Abstract

Building intelligent machines has been a long dream of humanity. While the journey has been difficult and slow, the progress in Machine Learning, Optimization Techniques and advancement in Deep Belief Networks offers promising ways to engineer cognitive systems. The science behind cognitive computing seeks to develop systems that emulate human brain functions such as perception, knowledge accumulation, goal planning, and logical inference. Cognitive systems will operate at a speed and an informational capacity that far exceeds human capability. They will serve to act as an advisor, partner, helpmate, and co-creator to the humans, collaborating on human terms.

Cognitive computing is a fundamentally new computing paradigm for tackling real world problems, exploiting enormous amounts of information using massively parallel machines that interact with humans and other cognitive systems. Cognitive systems will bring human-like reasoning to the problems of Big Data, and will also permit us to expand into the white space of domains that require human-like cognition but that either exceed human capacity or are impossible for a live human presence.

In this talk, I will review the past progress and discuss the future challenges. I will address the architectural challenges of building a general purpose system of systems that can learn, can reason, and can interact in a human natural way.

Categories and Subject Descriptors
[I] Computing Methodologies, [I.2] Artificial Intelligence

Keywords
Learning, Analytics, Natural Language, Knowledge, Reason.

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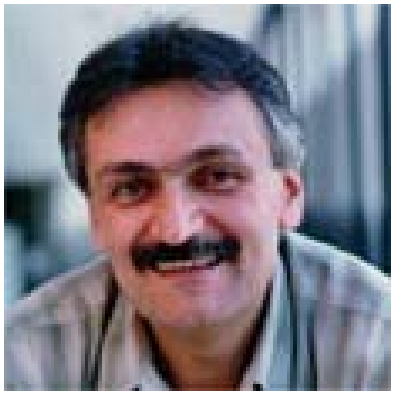
Bio



David Nahamoo is an IBM Fellow and the Speech Chief Technology Officer at IBM Research. He is responsible for IBM Research technical and business strategy directions for speech technologies. He provides technical direction for Conversational and Multimodal Interaction, Speech-To-Text, and Speaker Verification Technologies at IBM Research Labs worldwide. After obtaining a PhD from Purdue University in electrical engineering in 1982, David joined IBM as a Research Staff Member. David became the Senior Manager of the Human Language Technologies Group in 1993. He was the Interim General Manager for IBM Speech Business Unit in 1993 and was the Core Team Member of the Business Unit between 1993 and 2006. During these years, he was responsible for delivering speech technologies to IBM Divisions for desktop, embedded, and server-based speech products, managing a team of 60 scientists at IBM Watson Research Center in Yorktown Heights, New York and a team of 20 researchers and developers in Prague. David is a Member of IBM Academy of Technology and a Fellow of the IEEE. In 2001, he received the IEEE Signal Processing Best Paper Award. He holds 40 patents and has published more than 70 technical papers in scientific journals. During the past 2 years, David has been focusing on Cognitive Computing with an emphasis on natural human machine interfaces, multimedia analytics, and mobile security.