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Natural language based intelligent robot to advance industrial automation and Digital Manufacturing

Automation had started in the late 18th century with mechanization of textile industry and initiated the first industrial revolution. It then continued and started the second industrial revolution in early 20th century when Henry Ford mastered the moving assembly line and ushered in the age of mass production. The first two industrial revolutions made people richer and more urban. The biggest benefit of automation is that it saves labor. However, it is also used to save energy and materials and to improve quality, accuracy and precision. Now a third revolution is under way. Manufacturing is going digital. And what would be the next? We believe it will be intelligent agent based robots (soft-bots) that will take industrial automation digital manufacturing to the next level. Such robots will also communicate more naturally with human and machine. The dominant mechanism for natural communication is Natural Language Understanding (NLU) and processing. This study focuses on the key issues of robots to drive industrial/manufacturing automation and discusses specifically the NLP (Natural Language Processing) algorithms and Intelligent Agent (IA); the two core components of future automation. NLP is very important for the best HCI (Human Computer Interaction): Natural language based interaction, in general, is the most preferred communication with man as well as machine. Clearly understanding user's input by IA is also the key to take necessary actions. And NLP can also make the search space significantly smaller in taking necessary actions. The core to NLP is a semantic engine that can understand the semantics and is critical for any complex NLP based applications. Semantic Engine is also the key for cognitive computing. We will discuss a Semantic Engine using Brain-Like Approach (SEBLA) and associated NLP & NLU to address the key problems of intelligent robot based automation. SEBLA based NLU (SEBLA-NLU) resembles human Brain-Like and Brain-Inspired algorithms and hence is good at dealing with natural language based interactions. In fact, SEBLA and IA are also very critical to solve most Big Data problems, especially when data is dominated by text. Our proposed SEBLA and IA based solution would make it much easier to effectively use robots (and softbots) by non-technical, semiliterate, illiterate as well as by technical people.

Biography

Emdad Khan is Chairman of InternetSpeech which he founded with the vision to develop innovative technology for accessing information on the internet anytime, anywhere, using just an ordinary telephone and the human voice. He is a Faculty at Maharishi University of Management, Iowa, USA and a Research Professor at Southern University, Louisiana, USA. He holds 23 patents and published over 75 journal and conference papers on intelligent internet, natural language processing/understanding, machine learning, big data, bioinformatics, software engineering, neural nets, fuzzy logic, intelligent systems and more. He has developed the prototype of voice internet and semantic engine using brain-like approach.

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