

Lifelong machine learning based intelligent robots/softbots to advance industrial automation

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Abstract

A fully capable Robots/softbots (Intelligent agent) would need to have most learning and decision making capabilities of a human self-learning, cognitive intelligence, creating knowledge, learning from experience, determining what to be learned and the like. Existing Machine learning (ML) algorithms are dominated by isolated learning (e.g. in Supervised learning, a specific dataset for a specific task in a domain is used to train an ML for regression or classification). The generalization capabilities of such systems are closely related to data, task and domain used to train and hence limited in scope (Transfer learning can help to a good extent though for some applications). But such systems do not create knowledge and cannot learn from previous knowledge or experience across tasks and across domains. However, recently there has been some good work that can help Lifelong machine learning (LML) i.e. can create knowledge from what was learned, use that knowledge to learn more and repeat the process like they do as human. However, such methods use algorithmic and statistical approaches for knowledge creation which do not scale up well and less flexible to model human-like learning. This will effectively enable LML capability in existing numerical data driven ML systems and nicely integrate that with LML systems using unstructured data – thus making a complete human like LML based intelligent system.

Biography

Emdad Khan is Chairman of Internet speech 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 also 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, Semantic engine using brain like approach, SEBLA and Machine learning algorithm for natural language processing, MLANLP.



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