

Deep Learning: for Machines to Understand Human Languages

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Abstract: Deep learning techniques have demonstrated tremendous success in the speech and language processing community in recent years, establishing new state-of-the-art performance in speech recognition, language modeling, and have shown great potential for many other natural language processing tasks. The focus of this lecture is to provide an extensive overview on recent deep learning approaches to problems in language or text processing, with particular emphasis on important real-world applications including spoken language understanding, semantic representation modeling, information retrieval, semantic parsing and question answering, etc. In the seminar, I will first survey the latest deep learning technology. I will then highlight the general issues of language processing, and elaborate on how new deep learning technologies are proposed and fundamentally address these issues. In addition, we will introduce recently proposed continuous-space representations for both semantic word embedding and knowledge base embedding, which are modeled by either matrix/tensor decomposition or neural networks.

Bio: *Xiaodong He* is a Researcher of Microsoft Research, Redmond, WA, USA. He is also an Affiliate Professor in Electrical Engineering at the University of Washington, Seattle, WA, USA. His research interests include deep learning, information retrieval, natural language understanding, machine translation, and speech recognition. Dr. He has published a book and more than 70 technical papers in these areas, and has given tutorials at international conferences in these fields. In benchmark evaluations, he and his colleagues have developed entries that obtained No. 1 place in the 2008 NIST Machine Translation Evaluation (NIST MT) and the 2011 International Workshop on Spoken Language Translation Evaluation (IWSLT), both in Chinese-English translation, respectively. He serves as Associate Editor of IEEE Signal Processing Magazine and IEEE Signal Processing Letters, as Guest Editors of IEEE TASLP for the Special Issue on Continuous-space and related methods in natural language processing, and Area Chair of NAACL2015. He also served as GE for several IEEE Journals, and served in organizing committees and program committees of major speech and language processing conferences in the past. He is a senior member of IEEE and a member of ACL.