How to Teach Machines to Learn from Human?

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I believe the goal of learning is to generalize from given instances to make better prediction and inference, which should be the same for both machine and human. Current machine learning models emphasize more on prediction than inference and pays little attention to how human learns, which is fine if our machines never have to interact with human.

However, Natural Language Understanding (NLU) is human-centered computing. Machines need to know how human perceive a natural language sentence since meaning is defined by human. For example, when is a sentence meaningful, and why is that? There are many different aspects of a sentence that machines need to reveal, such as people, events, times, places, objects, and its entailment (which could be different in different contexts). But, current machine learning seems to treat each of the above questions independent of (unrelated to) the others, especially in end-to-end model.

In this talk we shall discuss an explainable machine learning model, the Principle-based Approach (PBA). We shall illustrate how PBA can make use of fine-grained Linguistics and model long distance dependency. We will also demonstrate how to teach machines to learn to solve Primary School Math Word Problems.