

Apply deep learning technology to implement computer doctor

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A computer program called AlphaGo defeated the top human professional players in the full-sized game of Go, a feat previously thought to be at least a decade away. The technology employed by AlphaGo is deep learning.

In this paper, we propose to apply deep learning technology to implement computer doctor, which helps human physicians to practice medical diagnosis and therapy with better precision.

The approach consists of three steps.

1. Collect a large volume of EMRs (Electronic Medical Records) from top hospitals. Each EMR contains the description of the symptoms and the clinical evidences, lab test and radiological examination results, in addition to the diagnosis and prescription, etc. So far, we have collected more than 70 million of EMRs from the top hospitals in China.
2. Using the large volume of EMRs with good quality as the training dataset, apply deep learning algorithms to train the mathematical model, which approximates the functionality from the symptoms and evidences, lab test and radiological examination results, to the diagnostic results which usually are diseases, and therapy which are prescription of drugs and operations.
3. Given a patient with specific symptoms and evidences, lab test and radiological examination results, apply the mathematical model that was trained beforehand, to recommend the likely diagnosis and therapy to human physicians.