



复旦大学数学科学学院 数学综合报告会

报告题目: On the Statistical and Computational Properties of
some Emerging Cortical Learning Networks

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摘要: In this presentation, I will explore a particular cortical learning system codenamed the hierarchical temporal memory (HTM), invented and currently being developed by Jeff Hawkins at a California based company called Numenta. HTM conceptually claims to provide a scalable alternative to existing neural networks learning platforms, a realization achieved (says its inventor) by truly modelling the functional (physiological) way the cortical human system handles the learning process rather than attempting the daunting task of reproducing the structure (anatomical) of the brain as competing systems do. The conceptual framework of this approach reveals a mechanism that should inherently deal efficiently and scalably with spatio-temporal tasks that pervades and permeates artificial intelligence and machine learning tasks in particular, and human activities in general. In this talk, I will focus on the algorithmic component of the framework, and will specifically provide some of its underlying statistical and computational properties/aspects. I will argue that well known statistical tools can be used to formulate and solve the learning problem underlying the binary network resulting from the biological inspired representation of the components of this learning system. I will NOT be giving any specific computational examples, but will instead concentrate on sharing the concepts with the audience, with the hope of triggering many questions and an intellectually stimulating discussion. If time permits, I will also share pointers to my other statistical machine learning research interests, but again I intend to do so in a rather informal format to ease to exchange.

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