

Toward a Statistical Understanding of Deep Learning: the Expand-and-Reduce Method

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ABSTRACT

Big data analysis demands computer-intensive data-driven methods more than ever for exploring and modeling complex data structures. Because of its capability and flexibility to represent complex local and global data structures, "multi-level nets" or Deep Learning models can be practically very useful. However, architecture configuration and parameter optimization of such models are extremely challenging, both statistically and computationally. To overcome the difficulty, we propose an Expand-and-Reduce method for automated building of Deep-Learning models. The purpose of the method is three-fold: 1) it generates models for Artificial Intelligence-type of applications, 2) it can be used to do confirmatory-type analysis for investigating prior knowledge-based construction of network structures, and 3) it provides as a tool for in-depth investigation and understanding of data from scientific inference perspective. With simple examples, we show that our proposed method is promising to serve its purpose.

12:00 Noon, Tuesday, November 12, 2019
47 College Street, Room 106B
11:45 AM - Lunch served outside Room 106B

