

数学与系统科学研究院

计算数学所学术报告

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报告题目:

**Convolutional Neural Network with
Decomposed Filters**

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下午 14:00-15:00

报告地点: 科技综合楼三层

311 报告厅

Abstract:

Filters in a Convolutional Neural Network (CNN) contain model parameters learned from data. The properties of convolutional filters in a trained deep network directly affect the quality of the feature representation being learned. In this talk, we introduce a framework for decomposing convolutional filters over a truncated expansion under pre-fixed bases, where the expansion coefficients are adaptive. Such a structure not only reduces the number of trainable parameters and computational load but also imposes filter regularity by bases truncation. Apart from maintaining prediction accuracy across image classification datasets, the decomposed-filter CNN also produces a stable representation with respect to input variations proved under generic assumptions. The framework extends to group-equivariant CNNs where it significantly reduces the model complexity and demonstrates improved stability of the trained network. Joint work with Qiang Qiu, Robert Calderbank, and Guillermo Sapiro.

欢迎大家参加！