Tensors

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Overview

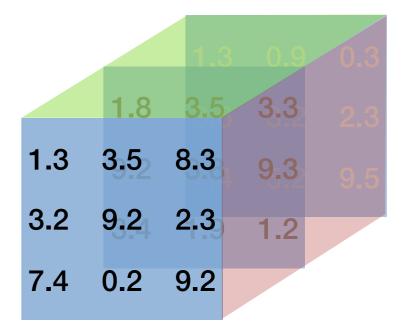
• Tensors: order-d matrices

Tensors

- Notation: T
 - Bold upper case
- Size: $size(T) = s_1 \times s_2 \times ... \times s_d$
- Order: $\dim(\mathbf{T}) = d$
- Indexing: $T_{ij...k}$

1.2 3.2 5.8

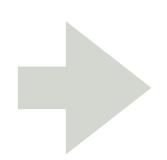
1.3 3.5 8.33.2 9.2 2.37.4 0.2 9.2



What are Tensors used for?

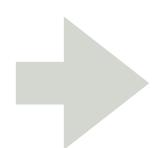
- In deep learning: everything
- Data
- Parameters
- Intermediate representations
- Input and output of almost any deep network operation

4



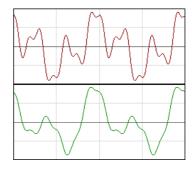
HxWx3 tensor

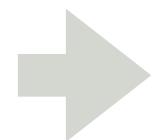
To understand the world, we humans constantly need to relate the present to the past, and put events in context. In this paper, we enable existing video models to do the same. We propose a long-term feature bank—supportive information extracted over the entire span of a video—to augment state-of-the-art video models that otherwise would only view short clips of 2-5 seconds. Our experiments demonstrate that augmenting 3D convolutional networks with a long-term feature bank yields state-of-the-art results on three challenging video datasets: AVA, EPIC-Kitchens, and Charades.



N tensor

N-char. doc





TxM tensor

T sec. of audio

Summary

• Tensors: order-d matrices

Basic building block of deep networks