Contribution ID: **19** Type: **Flash Talk**

VolRAFTv2: Volumetric Optical Flow Network for Digital Volume Correlation

Friday 22 November 2024 11:56 (6 minutes)

In materials science research, digital volume correlation (DVC) analysis is commonly used to track deformations and strains to elucidate morphology-function relationships. Recently, we proposed the neural network, VolRAFT, which estimated the 3D displacement vector between the reference volume and the deformed volume by extending the state-of-the-art optical flow network from 2D images to 3D volumes. However, this VolRAFT approach is limited by the available GPU memory due to the increased data dimensionality. Hence, in this talk, we will introduce a novel approach that extends VolRAFT by multi-scale volumetric blending to allow full-volume network training and inference.

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Session Classification: Flash Talks 2