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Reconstruction and Matching of Drosophila Neuronal Morphologies

Monday 27 October 2025 15:30 (1 hour)

The release of a Drosophila melanogaster central brain connectome reconstructed from electron microscopy (Scheffer et al., eLife 2020), as well as a large resource of transgenic Drosophila lines and respective sparse light microscopy acquisitions (Meissner et al., eLife 2023) have paved the way towards functional studies of a vast collection of individual neurons in vivo. We present here computational and AI approaches for reconstructing and matching individual neuronal morphologies across imaging modalities, which we have employed at scale to link avaliable electron- and light microscopy resources by means of solving billions of optimization problems.

Dagmar Kainmüller heads the Biomedical Image Analysis Lab at the Max-Delbrueck-Center for Molecular Medicine Berlin and the Berlin Institute of Health. The lab pursues theoretical advances in ML to solve challenging image analysis problems in biology, with a focus on cell segmentation, classification, and tracking. The aim of the lab is to facilitate scientific discovery via automated analysis of high-throughput microscopy data.

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Session Classification: Dagmar Kainmüller