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Event Reconstruction with Deep Learning (15' + 5')

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The recent Deep Learning (DL) renaissance has yielded impressive feats in industry and science that illustrate the transformative potential of replacing laborious feature engineering with automatic feature learning to simplify, enhance, and accelerate raw data processing. One area where DL is particularly helpful is in detector R&D and optimization, where analyzing prototype data or studying design choices in simulation can be hampered by availability and performance of reconstruction software. I will illustrate how DL systems can provide an easy means of obtaining the metrics necessary for R&D studies. In addition to minimizing the need for code development, these techniques are automatically tuned for different design choices. As an example, I will show how DL-based reconstruction in Liquid Argon and Gas Time Projection Chambers is helping detector design choices while already out-performing traditional algorithmic reconstruction.

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