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Machine learning detection of Standard Model jets in collider events

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We introduce a novel end-to-end framework for jet reconstruction in high-energy collider events, leveraging the efficiency and long-range modeling capabilities of the Mamba architecture.
Our model unifies instance segmentation, classification, and kinematic regression into a single multi-task learning system, enabling a sophisticated multi-level reconstruction that simultaneously identifies primary heavy jets (t, H, W/Z) and their constituent sub-jets.
Furthermore, we show that the model not only maintains stable performance in high-pileup environments but also successfully reconstructs the mass peaks of beyond the standard model particles.

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