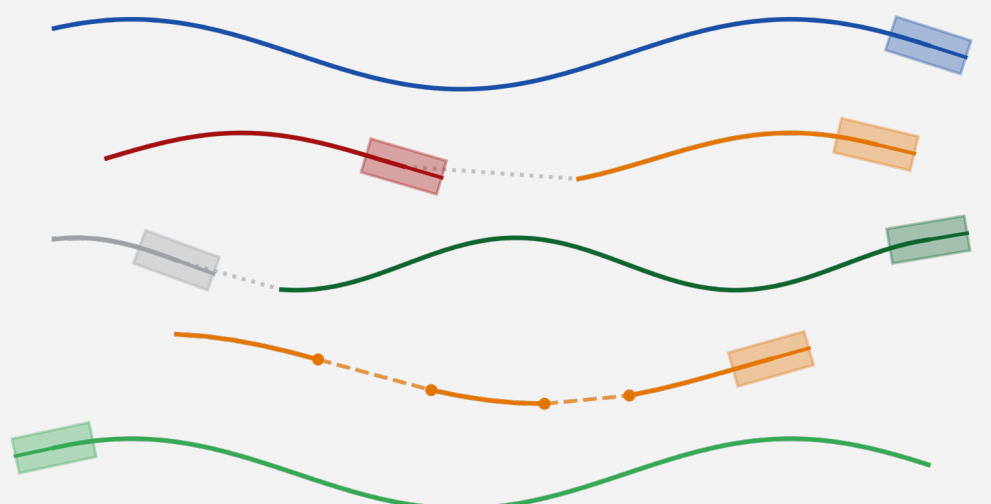
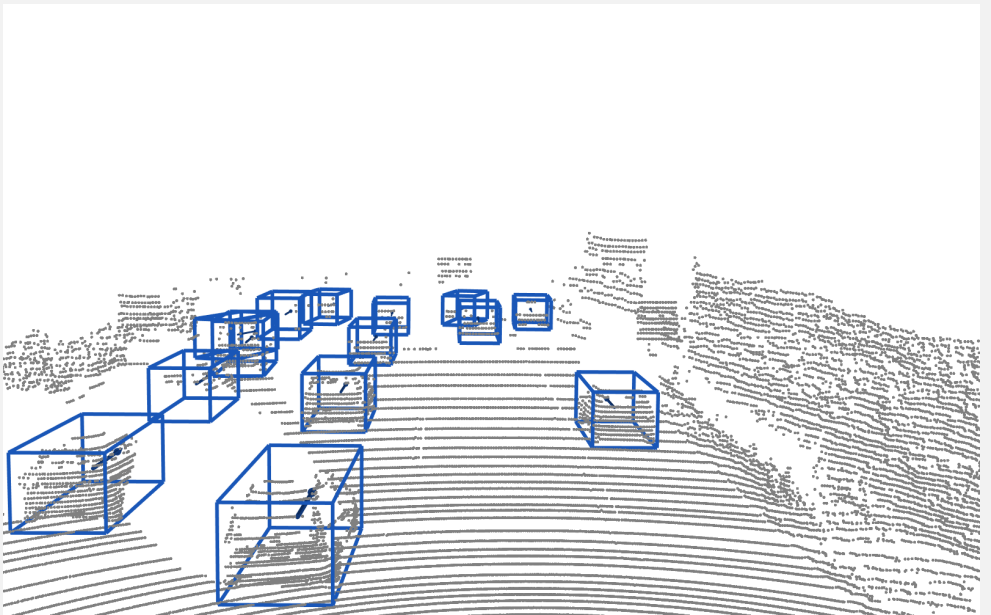


Inputs

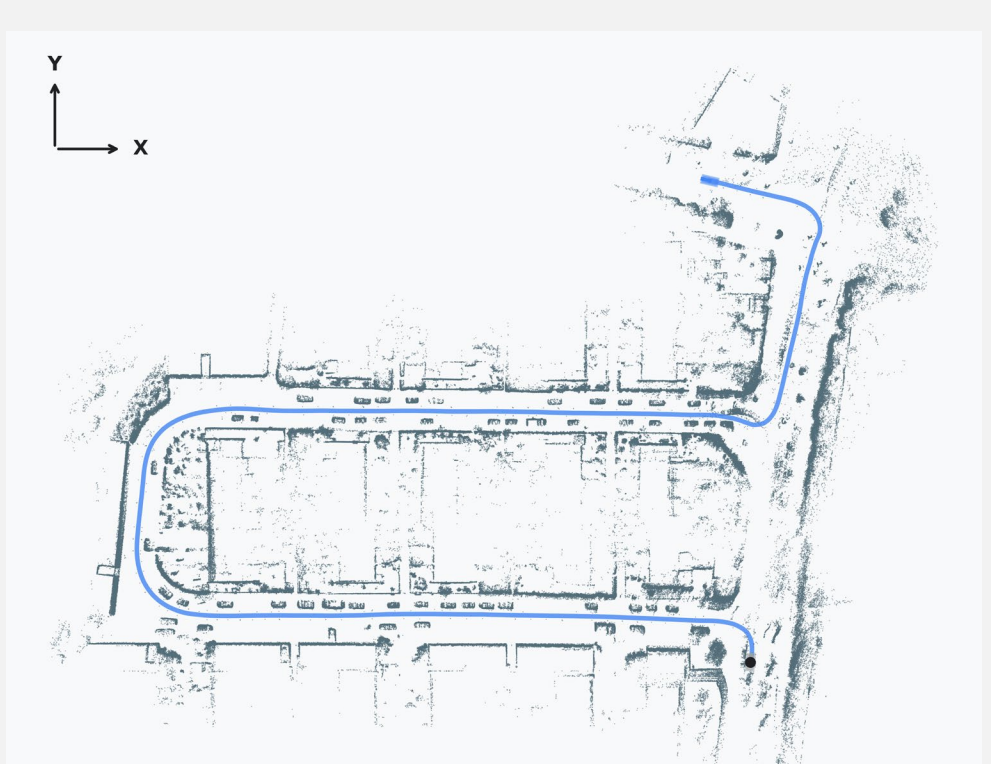
Initial trajectories $\mathcal{T}$



Detection pool $\mathcal{D}$

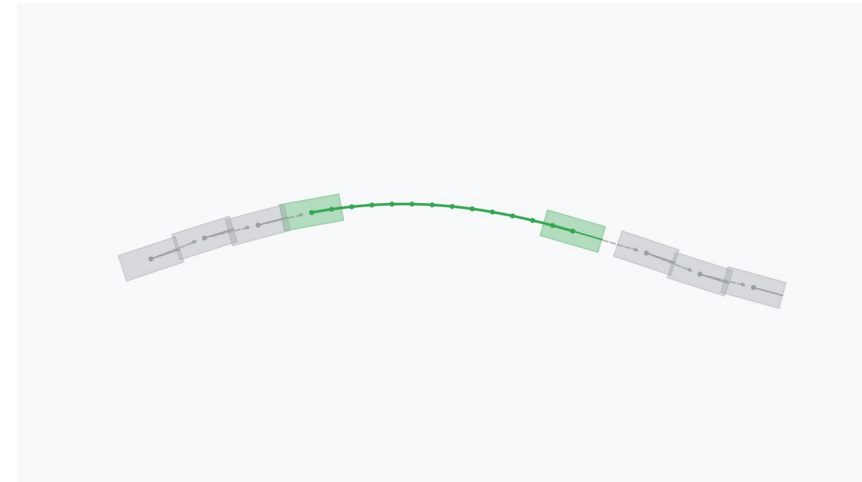


Ego-motion sequence $\mathcal{E}$



Trajectory-Centric Offline Optimization

Stage1: Quality-Driven Boundary Recovery



Track Reliability Metric $Q(T_i)$

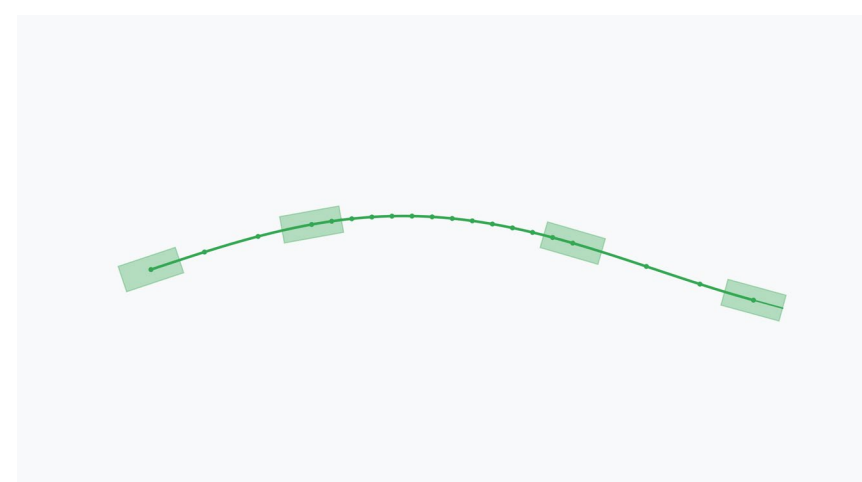
Quality-Adaptive Kinematic Prediction

Layer-wise Progressive Association

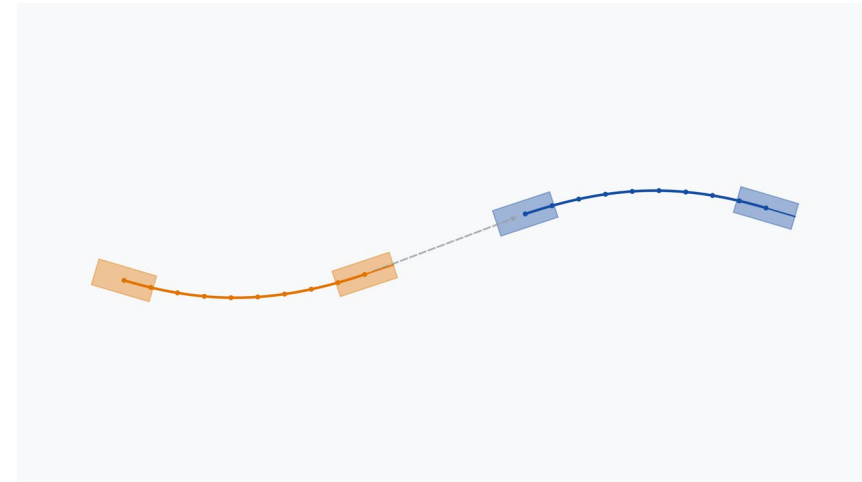
Spatial distance

Orientation cost

Size consistency



Stage2: Bidirectional Topology Repair



Fragment Representation

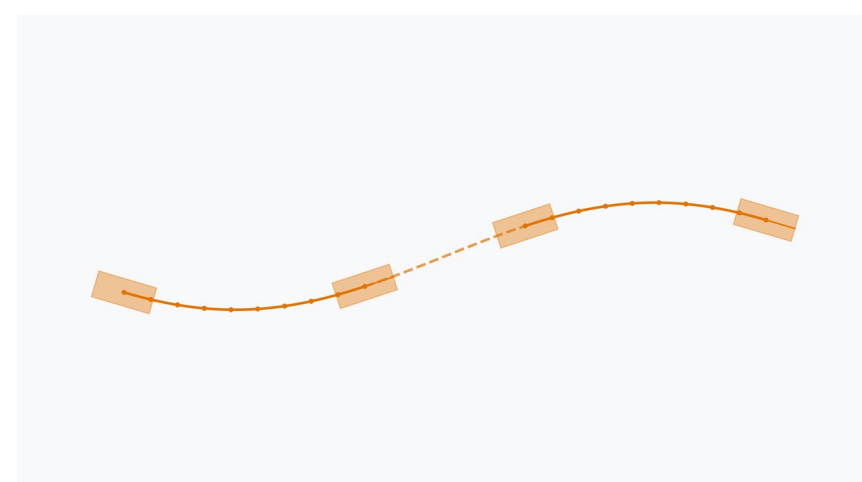
Bidirectional Motion Consistency

Forward Projection

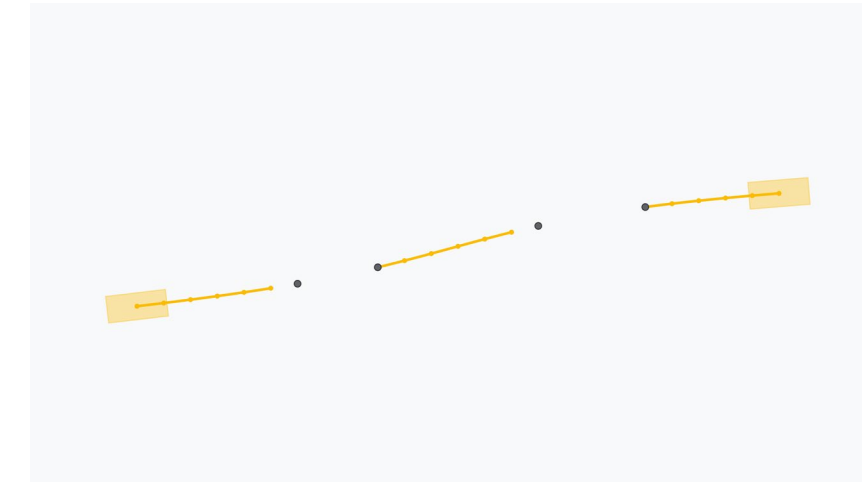
Backward Projection

Bidirectional Consistency Check

Bipartite Fragment Matching



Stage3: Confidence-Aware Interpolation

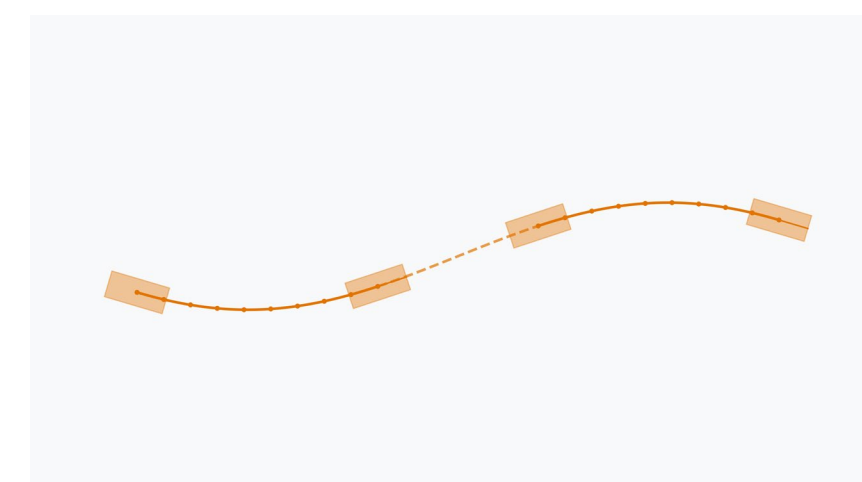


Gap Detection

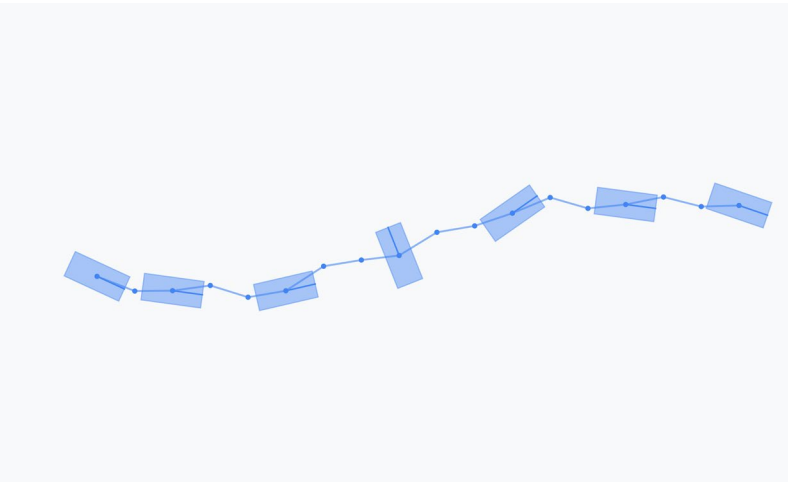
Hermite Spline $\mathcal{H}$

V-shaped Confidence Decay

Spatial Occupancy Constraints



Stage4: Kinematic State Refinement



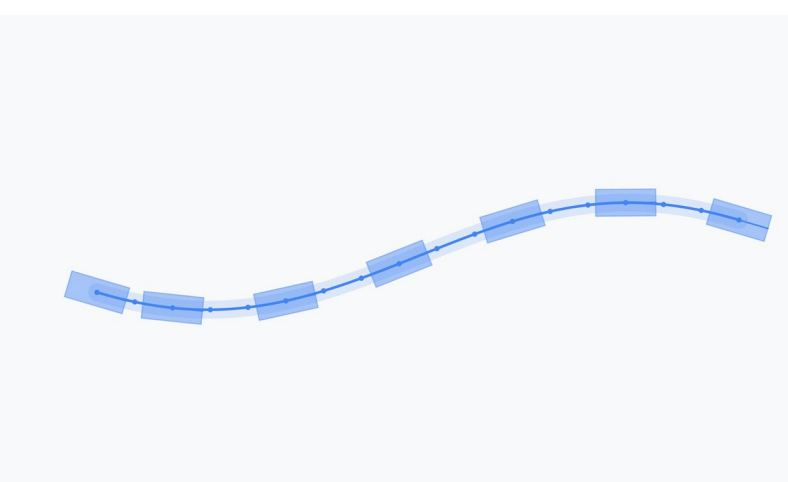
Confidence-Gated Kinematic Smoothing

Confidence-Gating

Savitzky-Golay Filtering

Robust Yaw Refine

Final State Update



Outputs

Optimized Trajectories $\mathcal{T}^*$

