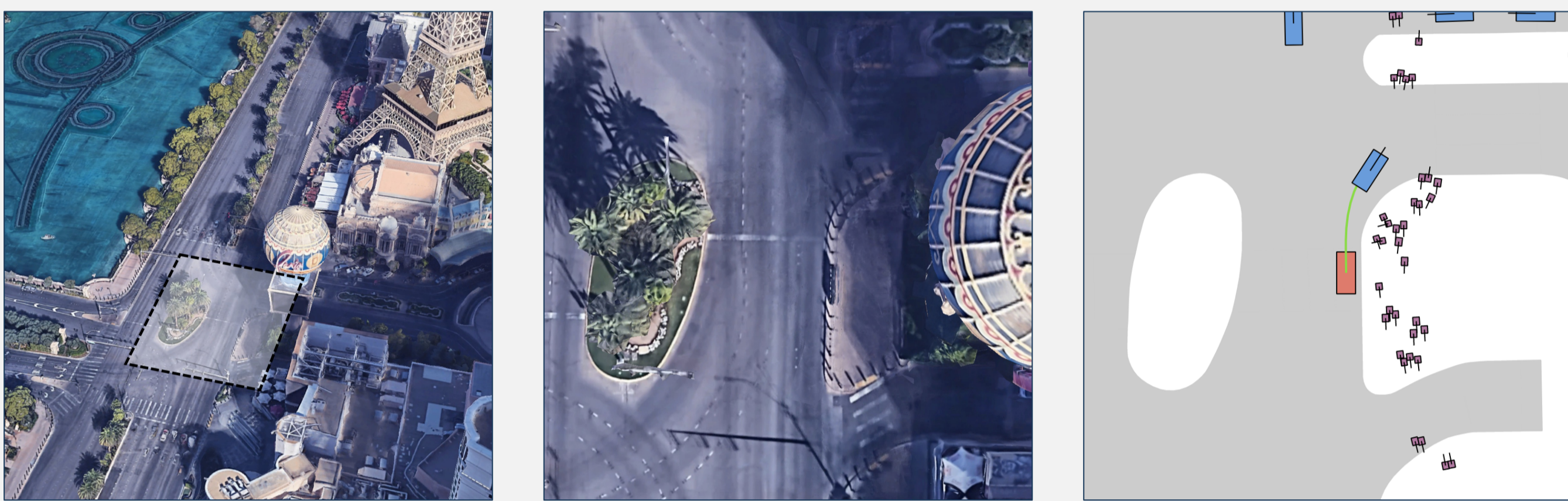


# Common Misconceptions in Vehicle Motion Planning

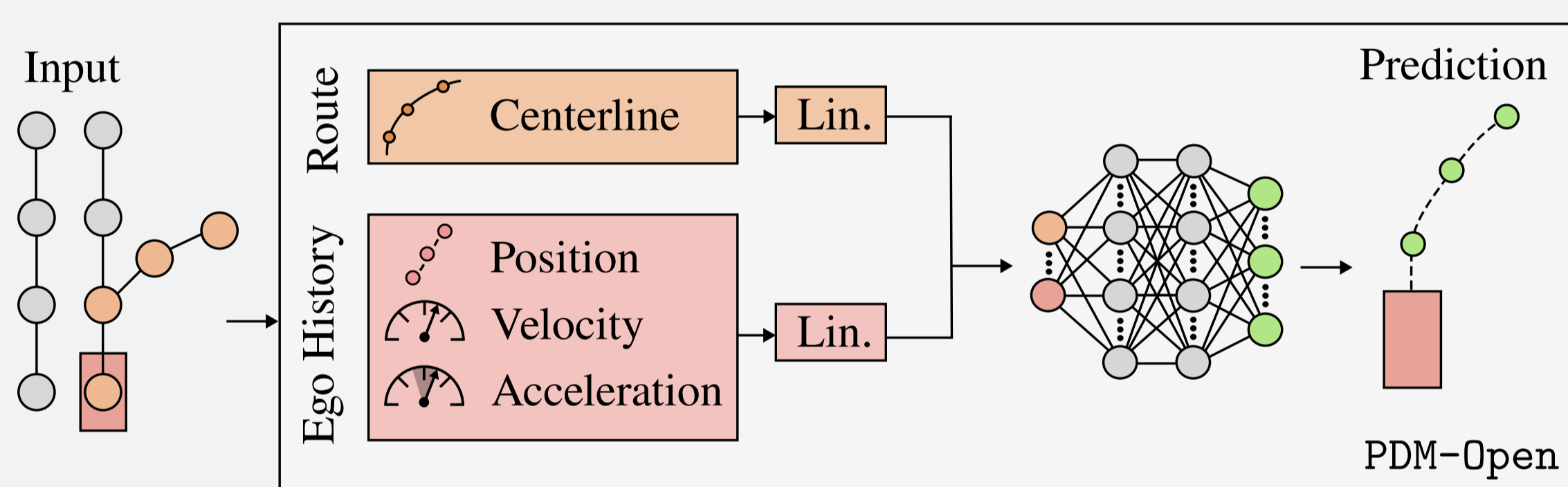


Daniel Dauner<sup>1,2</sup>, Marcel Hallgarten<sup>1,3</sup>, Andreas Geiger<sup>1,2</sup>, and Kashyap Chitta<sup>1,2</sup>  
<sup>1</sup>University of Tübingen, <sup>2</sup>Tübingen AI Center, <sup>3</sup>Robert Bosch GmbH

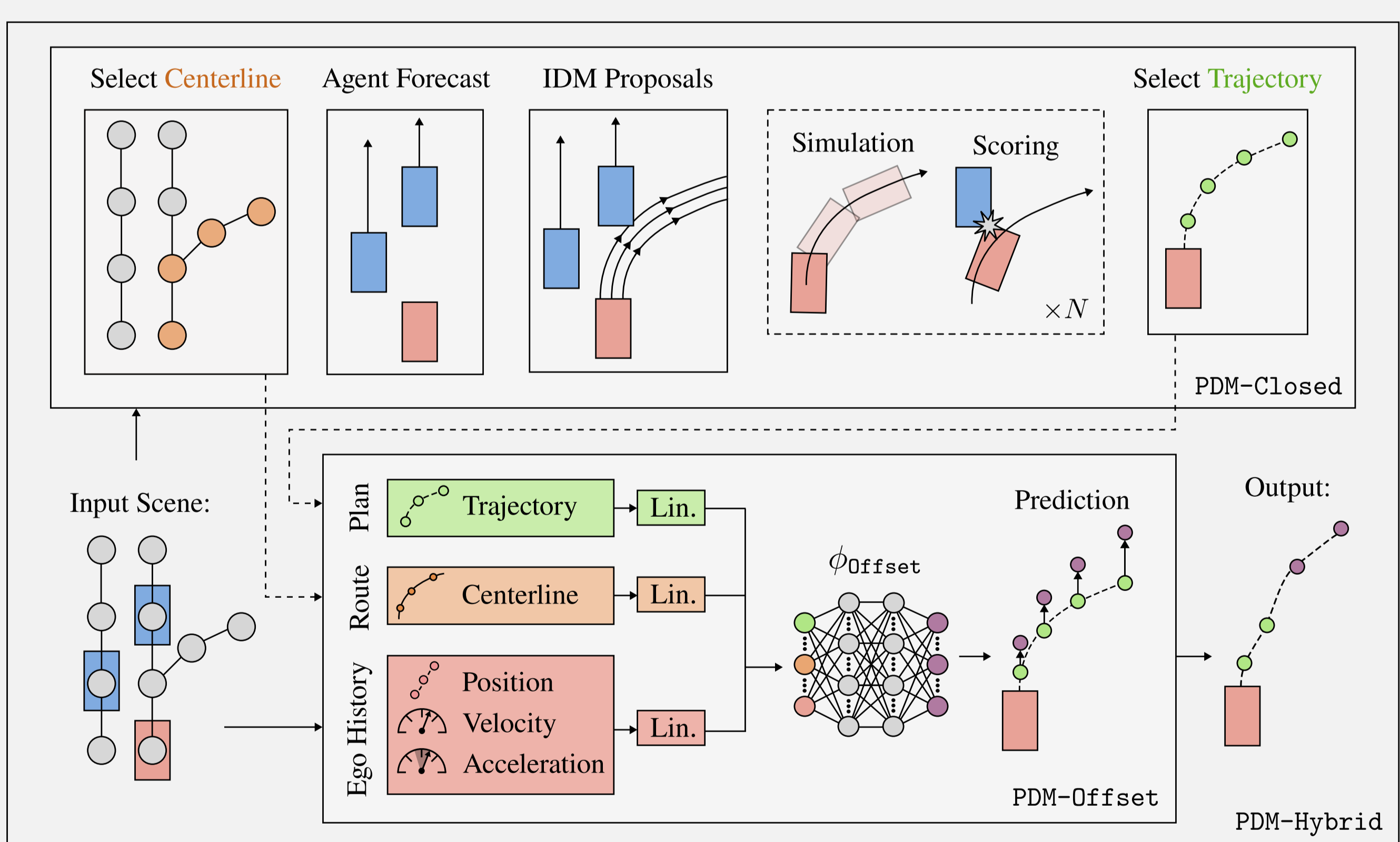
nuPlan is a new data-driven planning simulator.



We start with a minimal centerline representation...



...and combine it with a classical rule-based method



Method	Representation	Open-Loop	Closed-Loop
PlanCNN	Map+Agents (Raster)	64	73
Urban Driver	Map+Agents (Polygon)	76	44
PDM-Open	Centerline	86	54
PDM-Closed	Centerline+Agents	44	92
PDM-Hybrid	Centerline+Agents	84	92

With our insights, we developed PDM-Hybrid, which also placed **first** in the 2023 nuPlan Challenge!

## Misconceptions

**#1.** Detailed scene representations are crucial

**#2.** Rule-based planners do not generalize

**#3.** Open-loop and closed-loop planning are aligned