NET Σyn

HotNets '26

Autogram

Invariant Discovery for Networked Systems

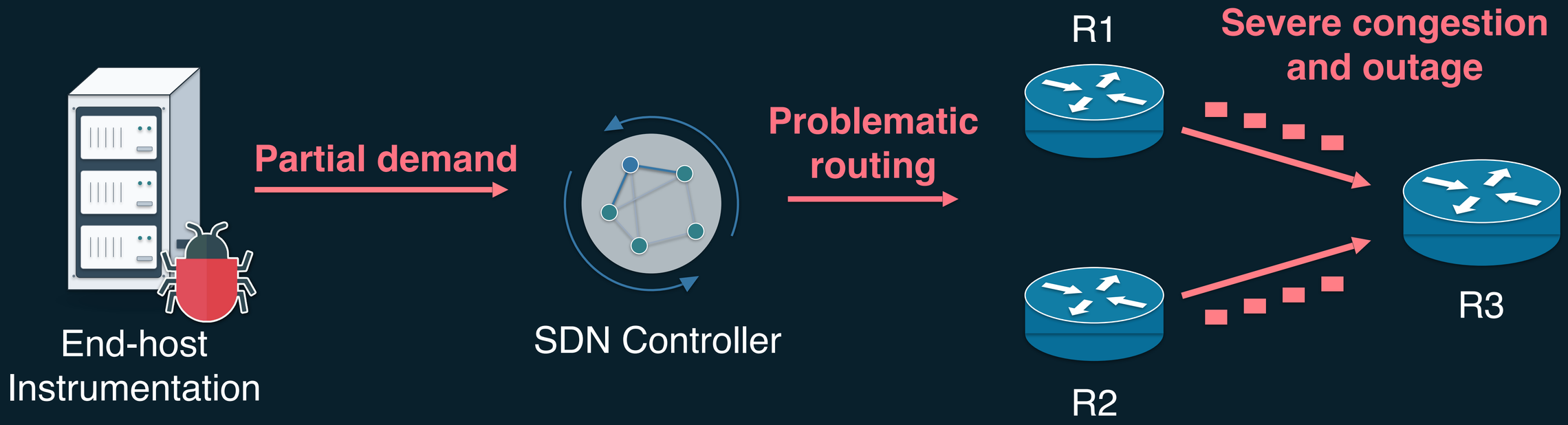
Hongyu Hè*, Alexander Krentsel*,
Sylvia Ratnasamy, Maria Apostolaki



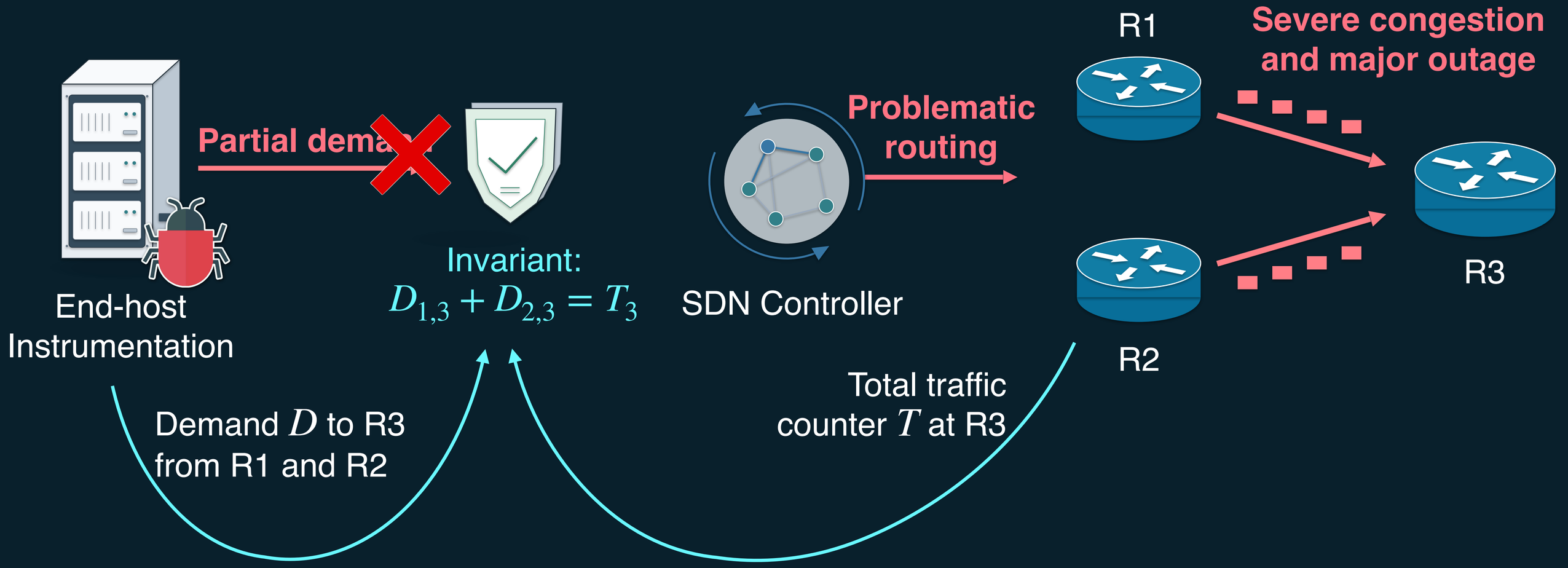




Invalid telemetry caused WAN outages[CrossCheck, NSDI '26]



Network invariants protect WAN and SDN controller



Manual specification: Slow and challenging

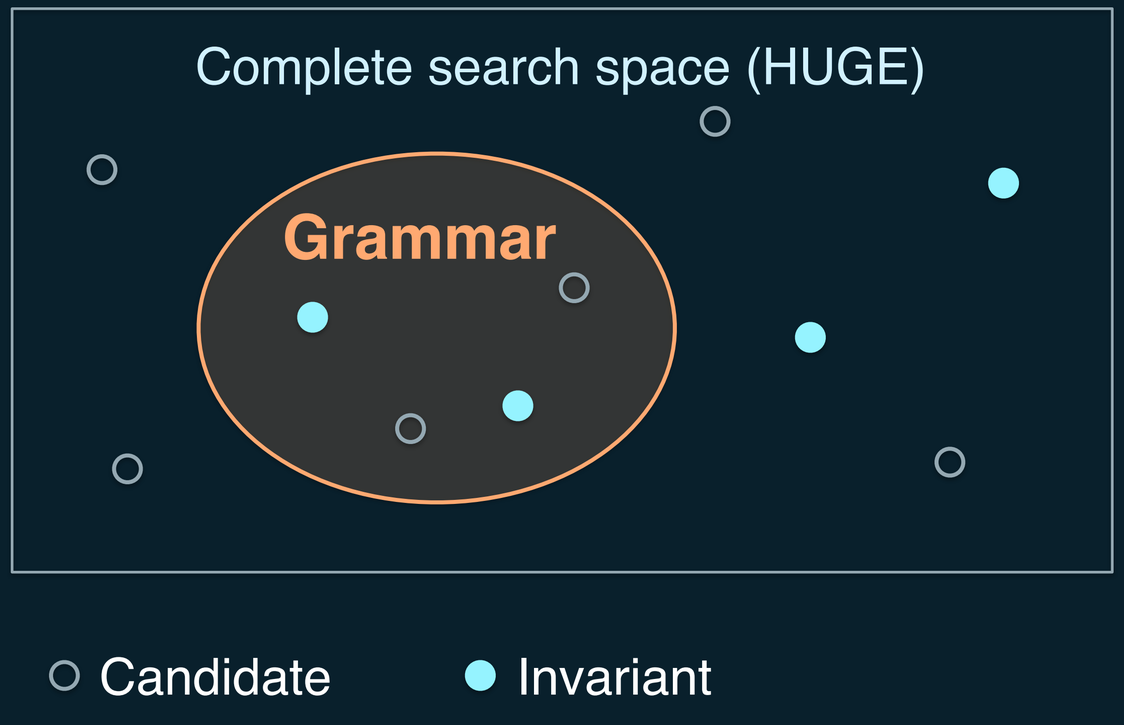


[NetNomos, NSDI ’26]: Scalable and automated

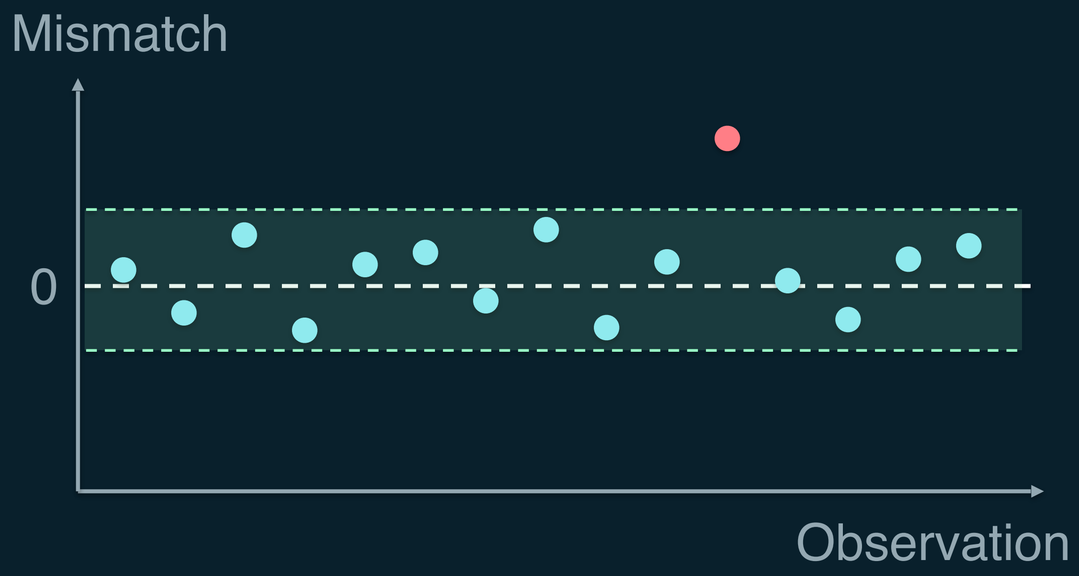
But …

Automated rule learning faces two key challenges

Challenging grammar design

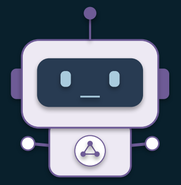


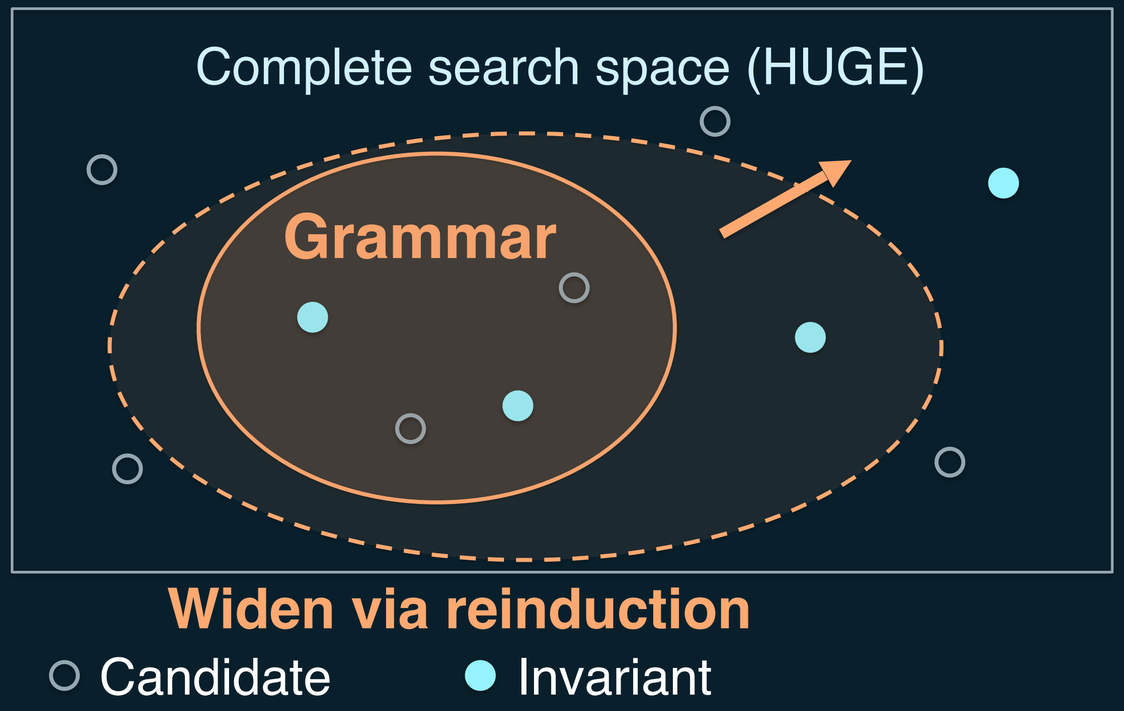
Noisy network telemetry



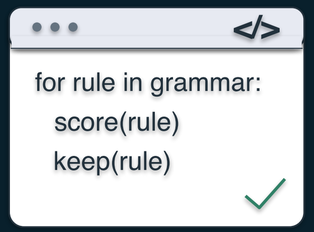
Autogram is an invariant discovery engine

AI-induced grammar
Names + metadata





Deterministic validation based on logic and statistics



Tolerance + hold rate

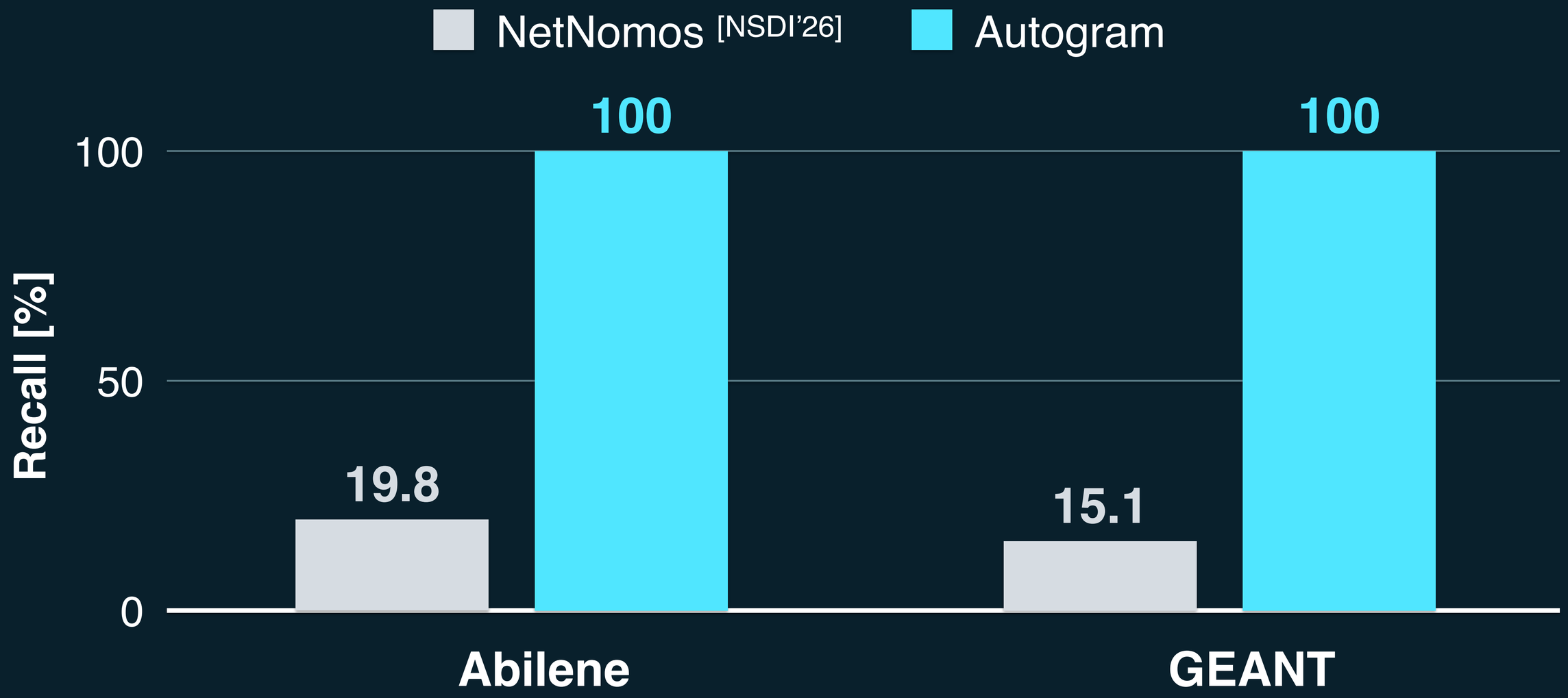


Telemetry



Soft and hard invariants

Grammar design + Uncertainty handling ⇒ Better Neurosymbolic



Join us at the demo session during HotNets 2026!

