WHAT CALIFORNIA'S SELF-DRIVING CAR DATA TELLS US ABOUT ACADEMIA'S SHORTCOMING

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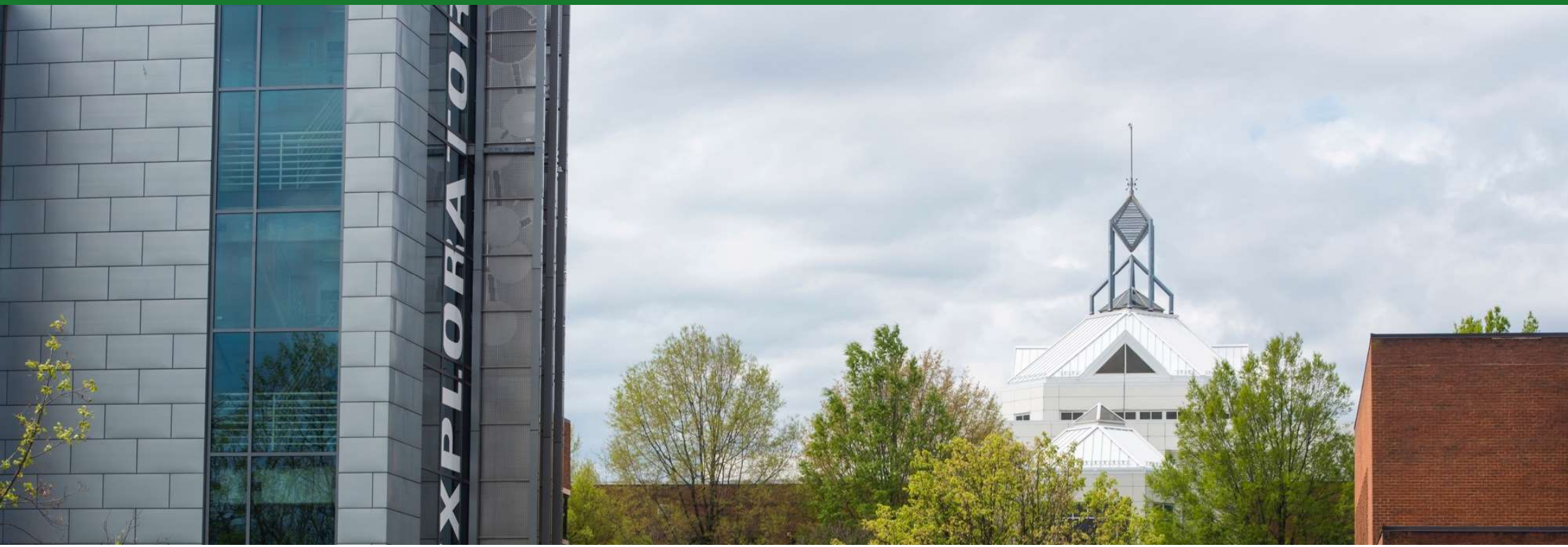
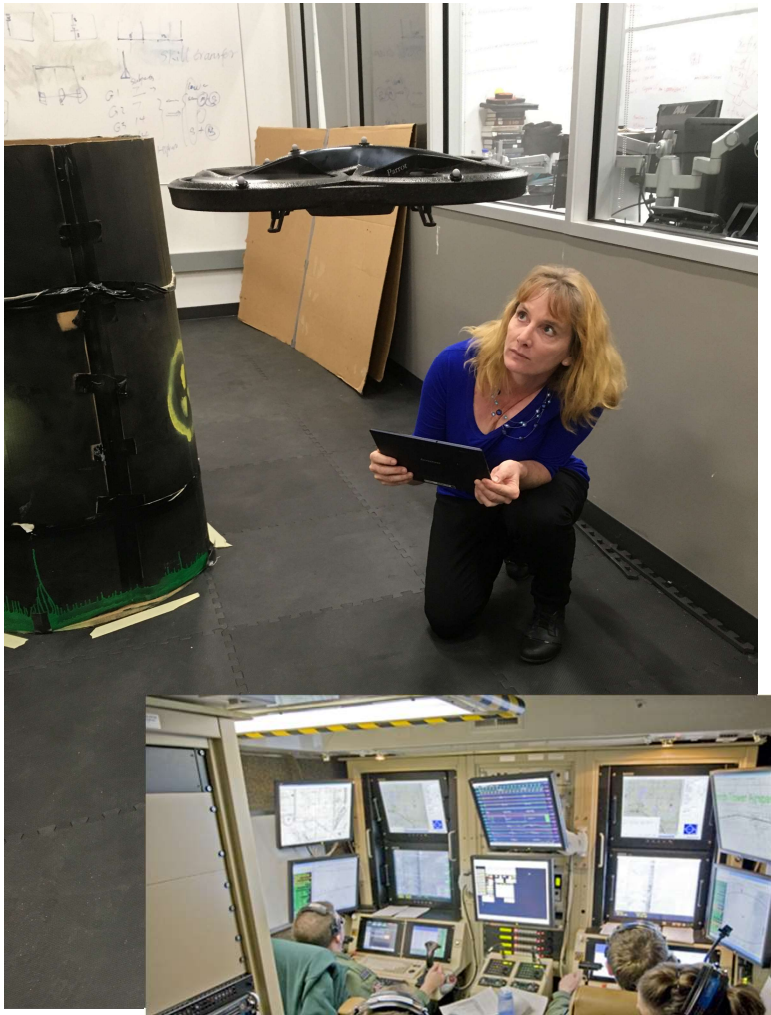
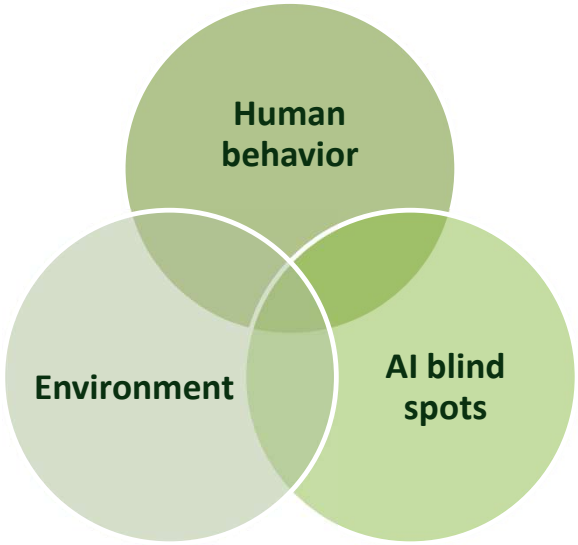




Autonomy/AI & Reasoning



Top-down reasoning

Uncertainty

Expert

Knowledge

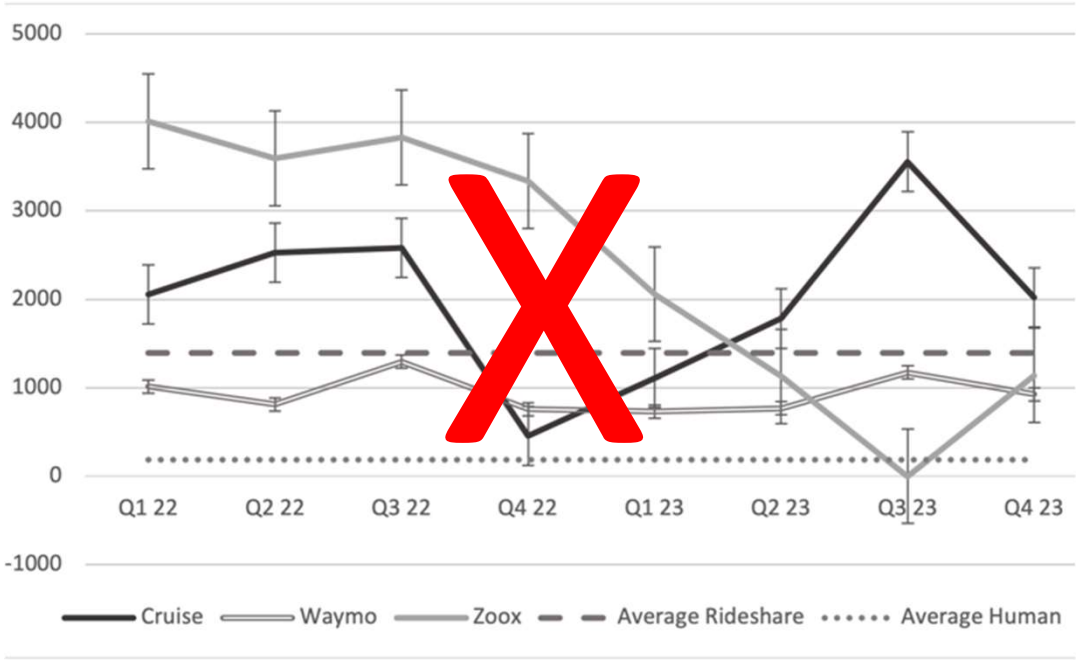
Rule

Skill

STOP

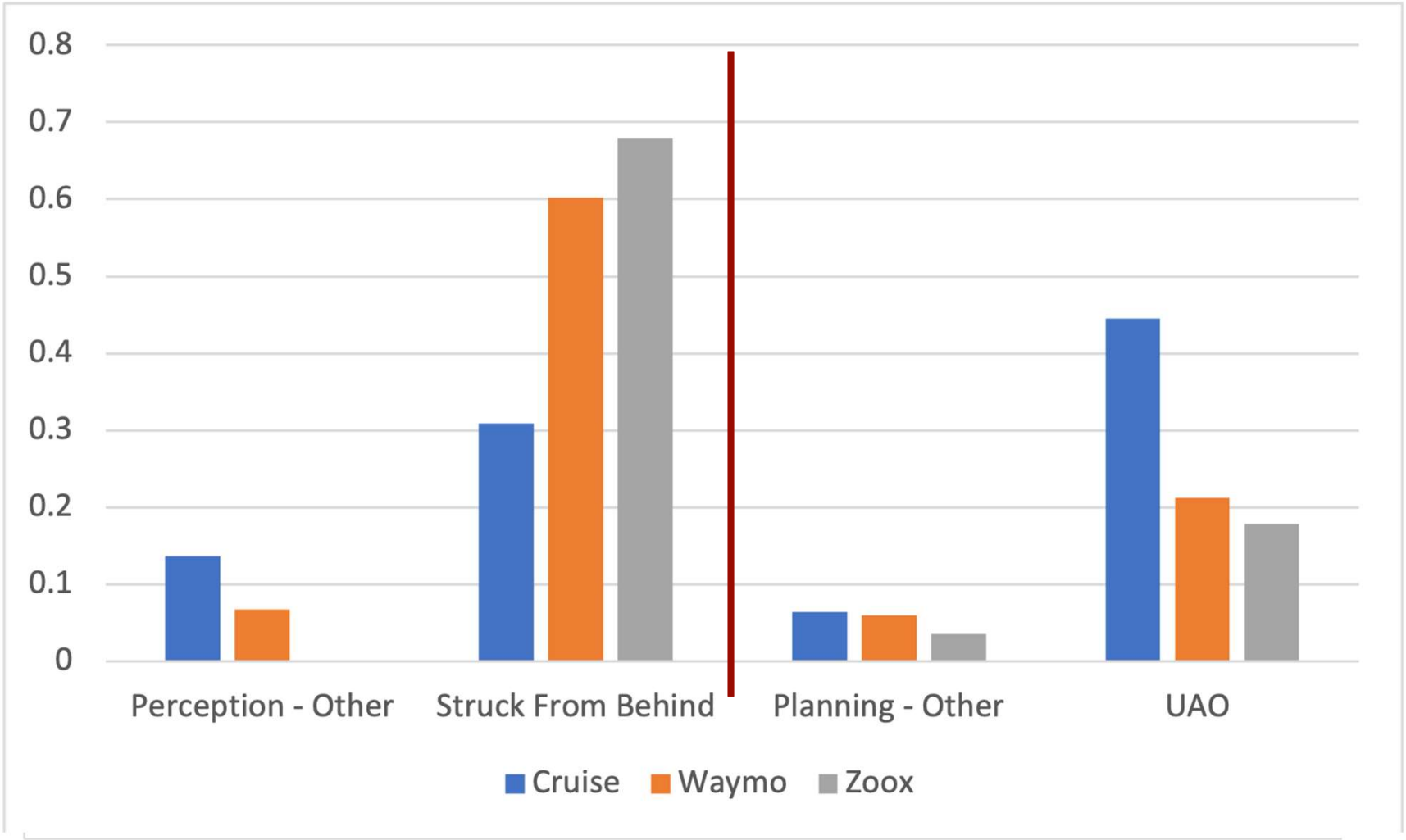
Bottom-up reasoning

CA Crashes

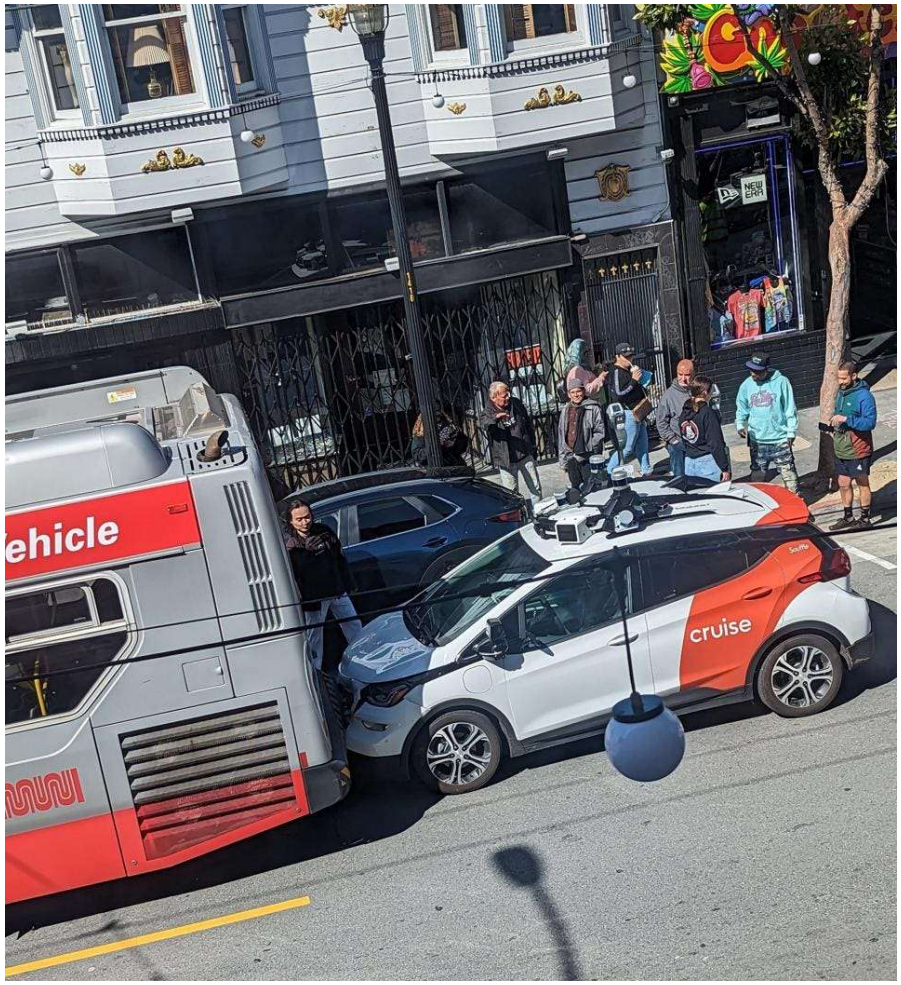


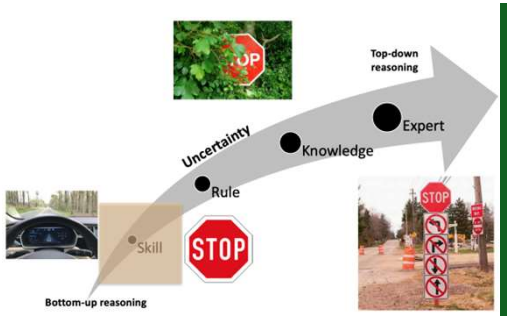
1. Transition vs steady state probabilities
   - Simulation doesn't count
2. Remote assistance/teleoperation

A closer look at WHY…

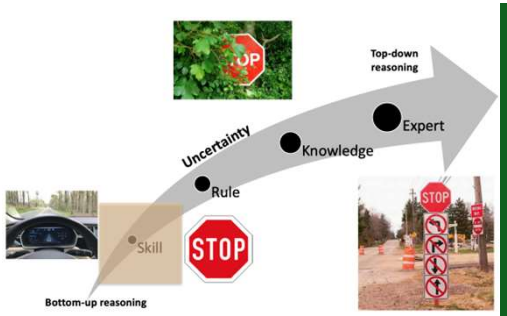


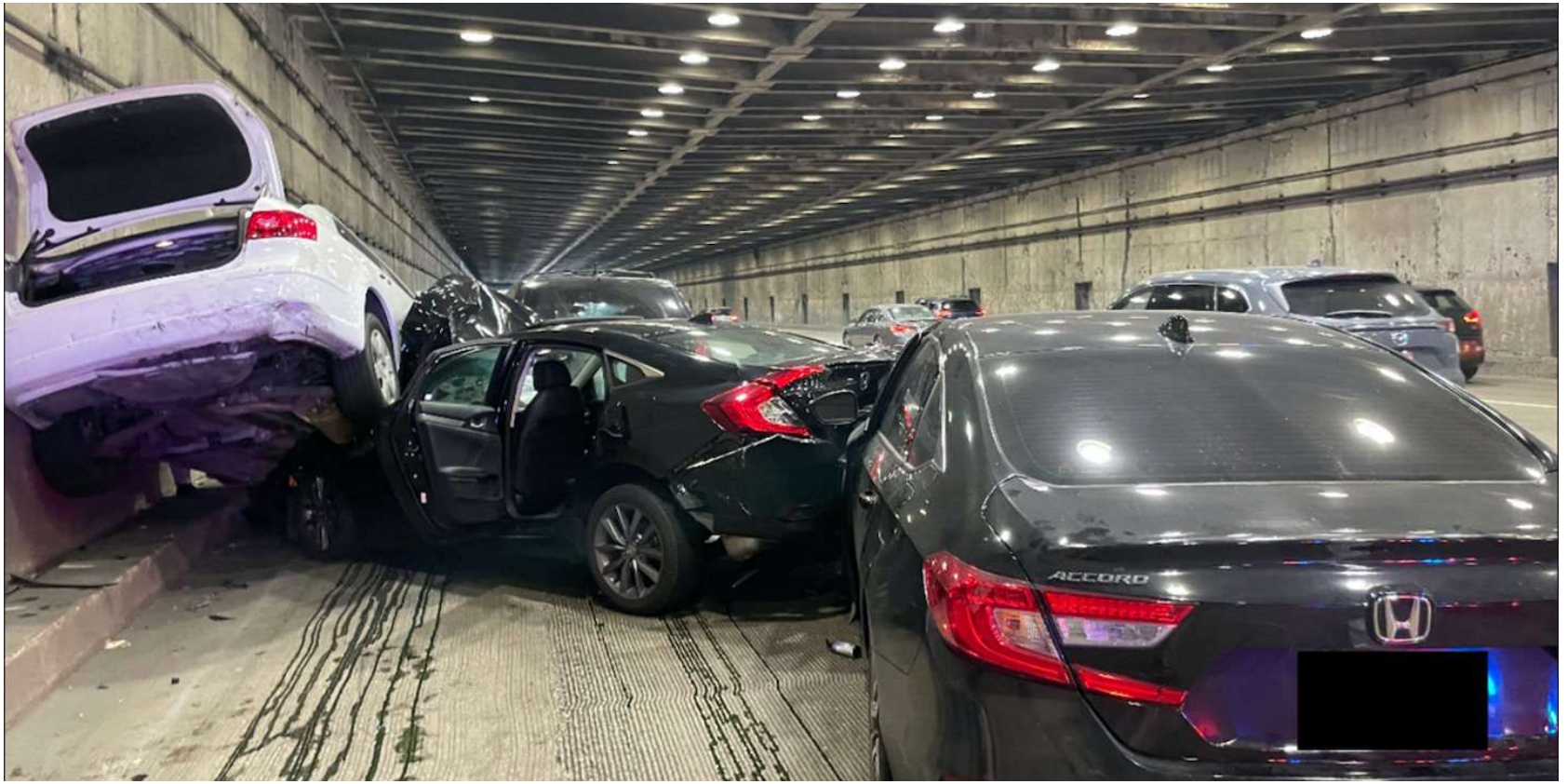
Perception: Missed Detections



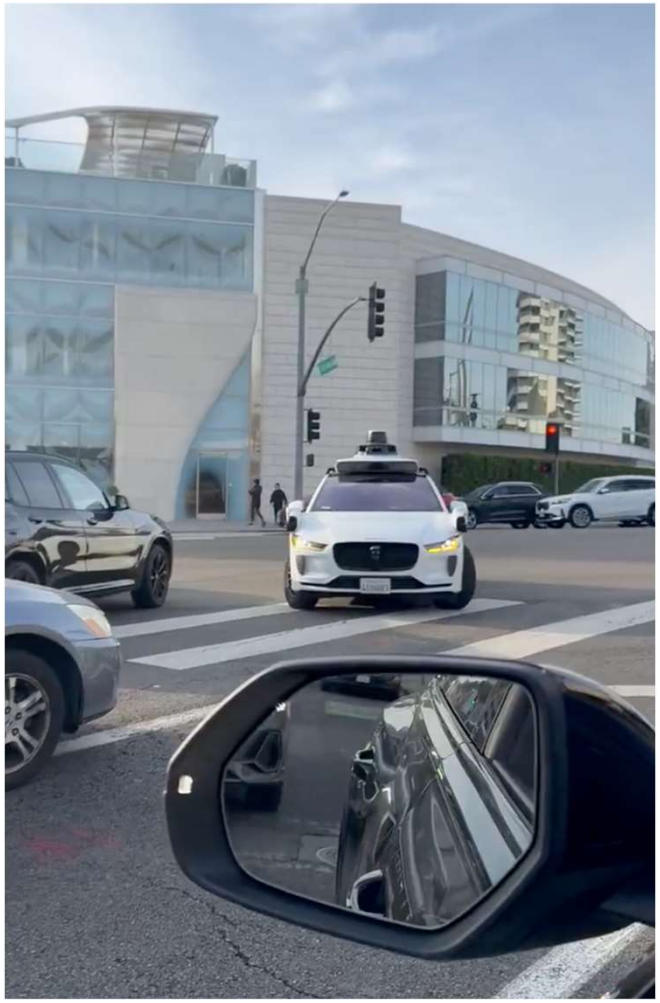


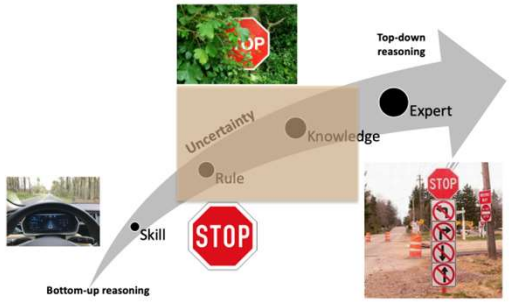
Perception: Struck-from-Behind



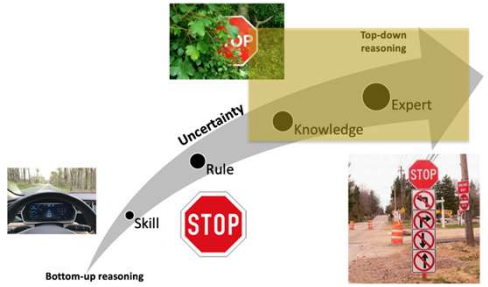


Planning: Internal Issues

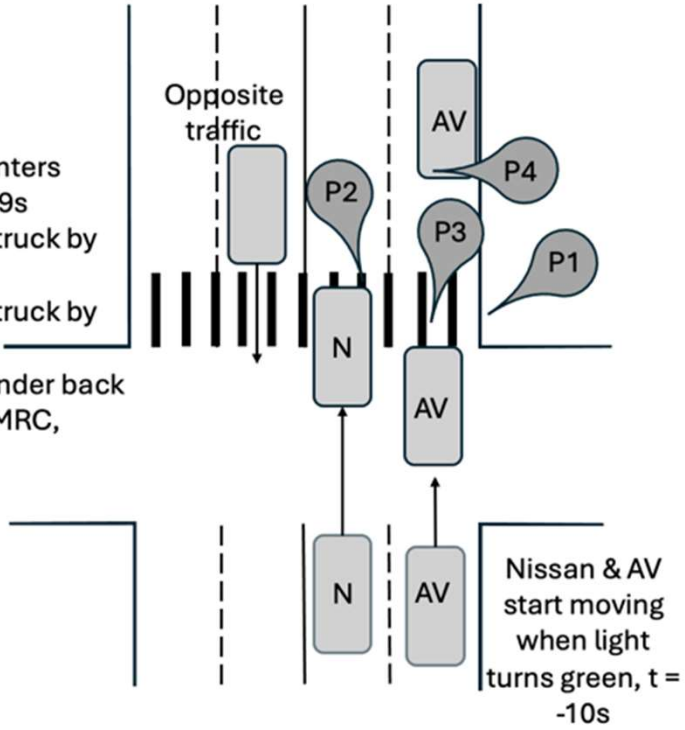




Planning: Unexpected Actions by Others

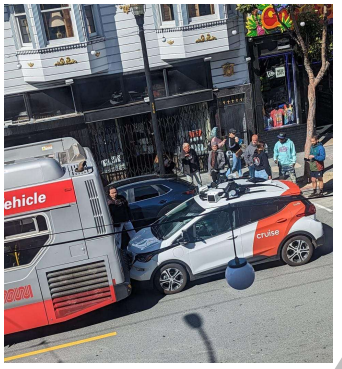


- P1: Pedestrian enters cross walk, t=-7.9s
- P2: Pedestrian struck by Nissan, t=-2.9s
- P3: Pedestrian struck by AV, t=0s
- P4: Pedestrian under back left tire after AV MRC, t=8.8s



Uncertainty management is key but relegated to the fringes

Epistemic



Top-down reasoning

Uncertainty

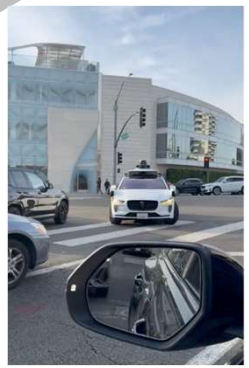
Expert

Knowledge

Rule

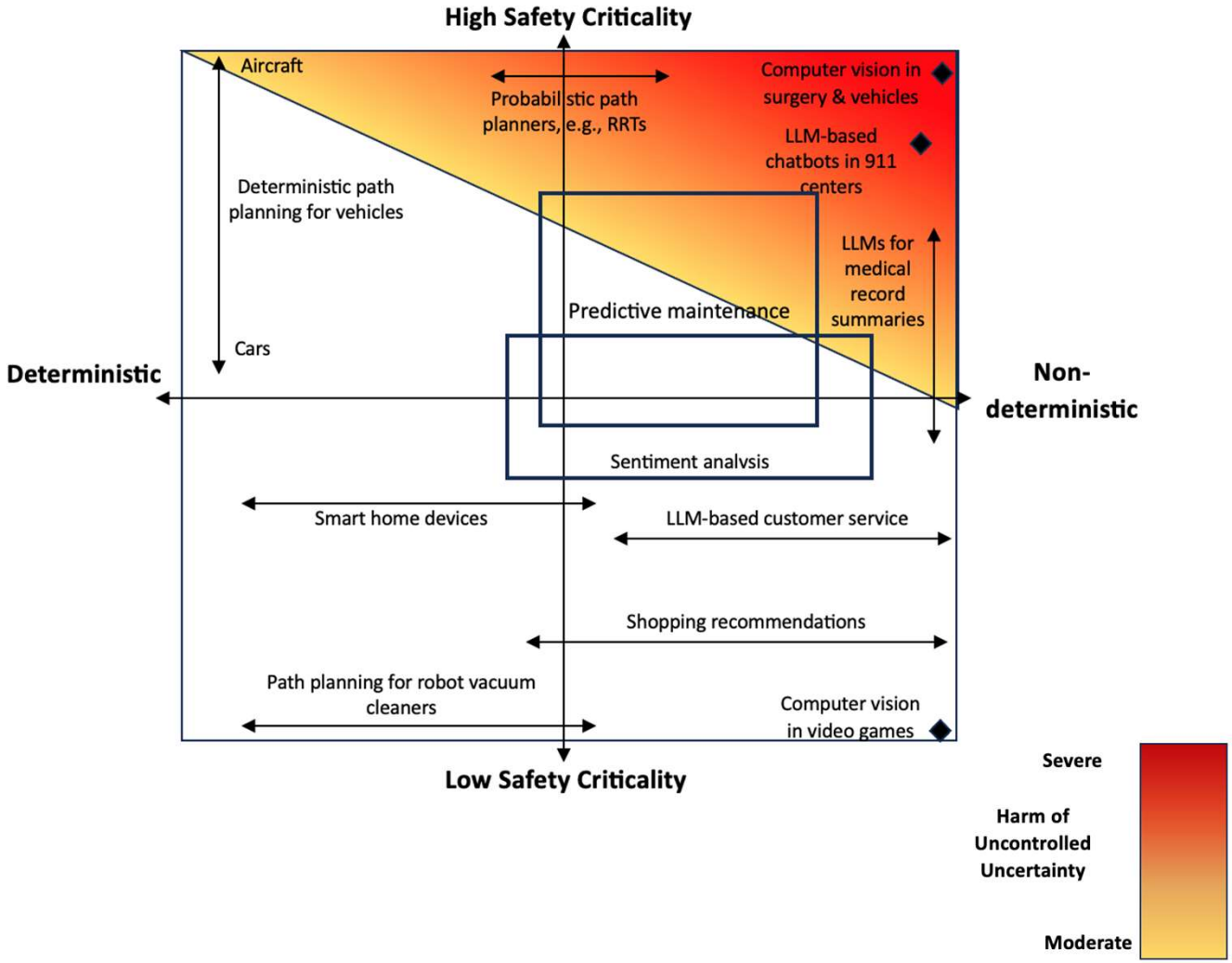
Skill

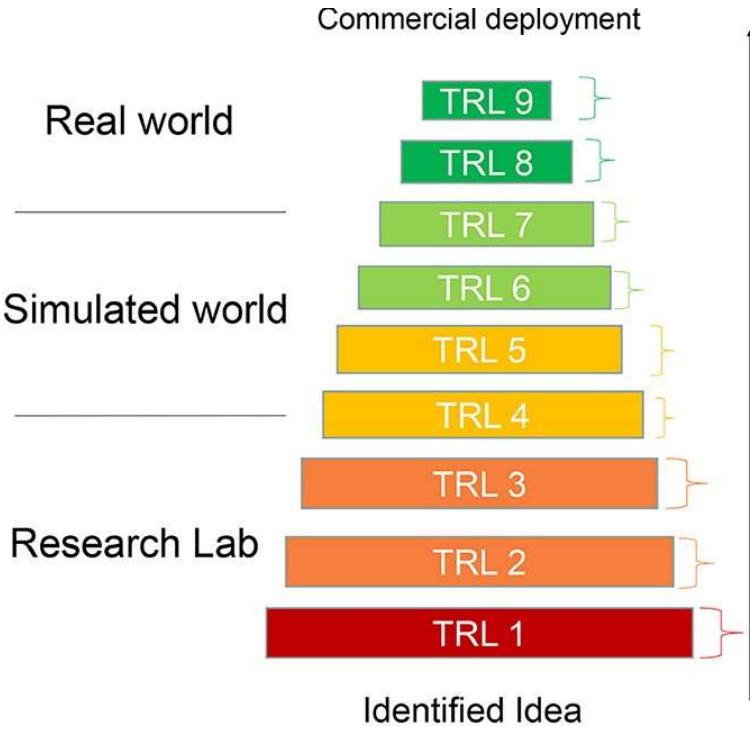
Aleatory



Bottom-up reasoning

The need for innovative AI T&E for non-deterministic systems





Questions?