How Do Autonomous Trucks Work?

Autonomous Trucking Conference

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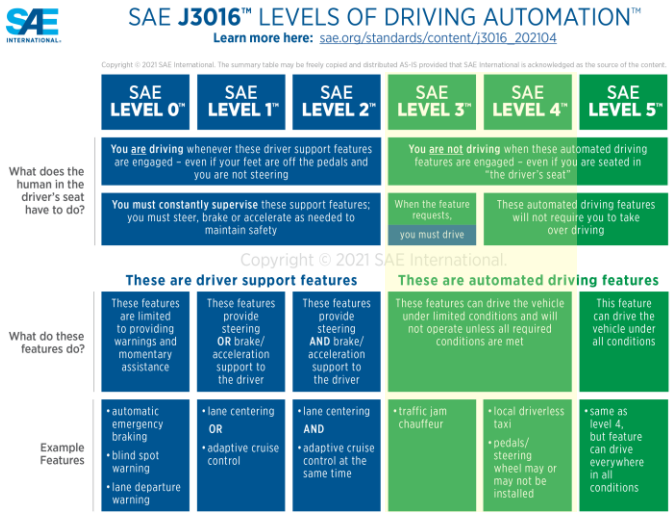
Robotics experimentation across air, land, and sea

Levels of Driving Automation



- Most autonomous trucks fall in Level 3 (with driver support as requested) or Level 4 (without driver support under operational conditions)
- Level 0-2 driver support features are increasingly prevalent but require driver control
- The "everywhere in all conditions" requirement for Level 5 remains a challenge

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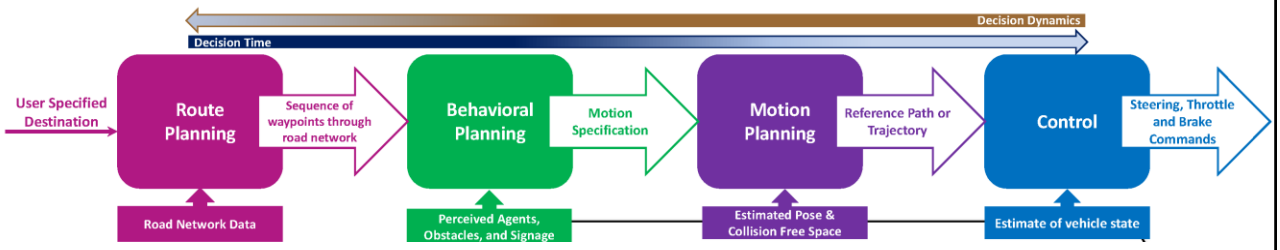
Decision-Making Process



Autonomous trucking companies use a set of **base maps** to provide the vehicle with background knowledge on the route and reduce dependency on real-time sensing

These phases involve **perceiving** the environment, **predicting** the motions of other agents, **deciding** on an optimal behavior, building a **trajectory**, and determine the **actuator** commands to execute the trajectory

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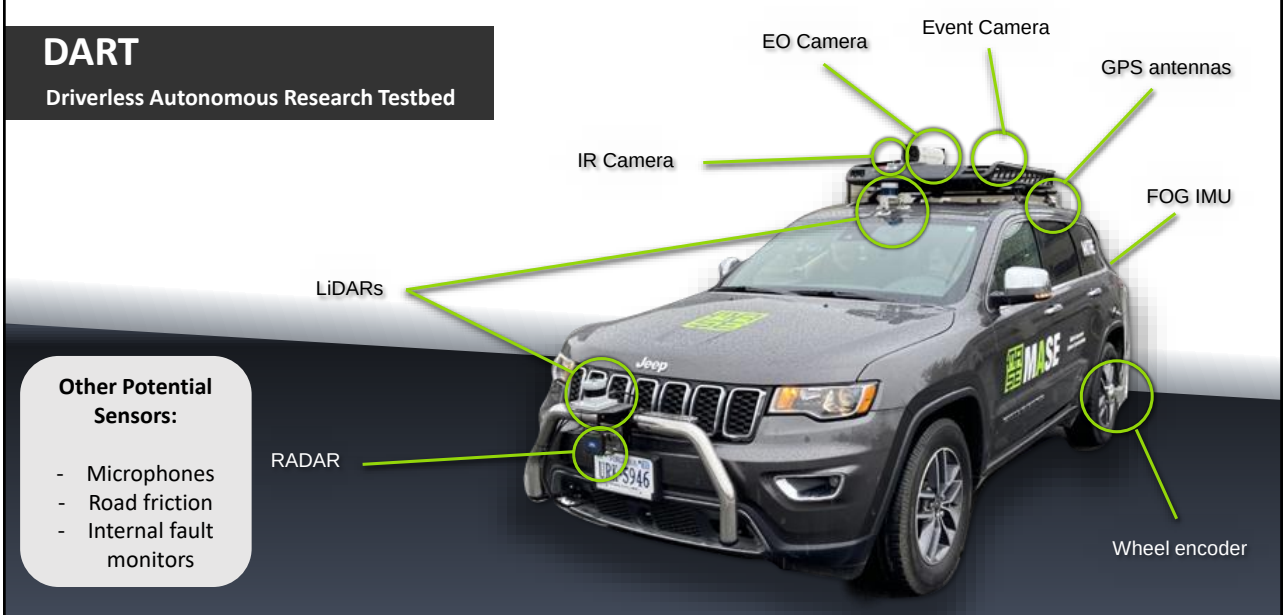
DART

Driverless Autonomous Research Testbed



Other Potential Sensors:

- Microphones
- Road friction
- Internal fault monitors

2019 Jeep Grand Cherokee with integrated drive-by-wire, computing, localization, perception, and power electronics

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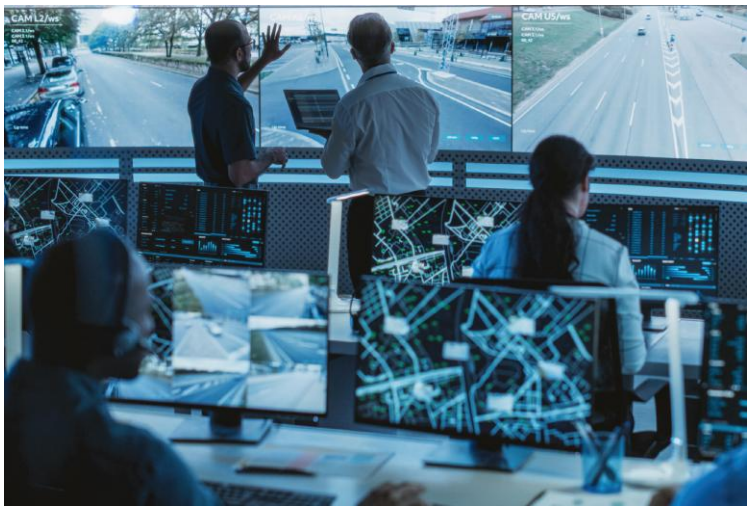
Remote Support



- Autonomous truck fleets are supported by remote operators who monitor operations and intervene when challenging situations arise
- Remote operators are typically not given full control of the vehicle, but rather the autonomous driver remains responsible for safety

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Thank you!

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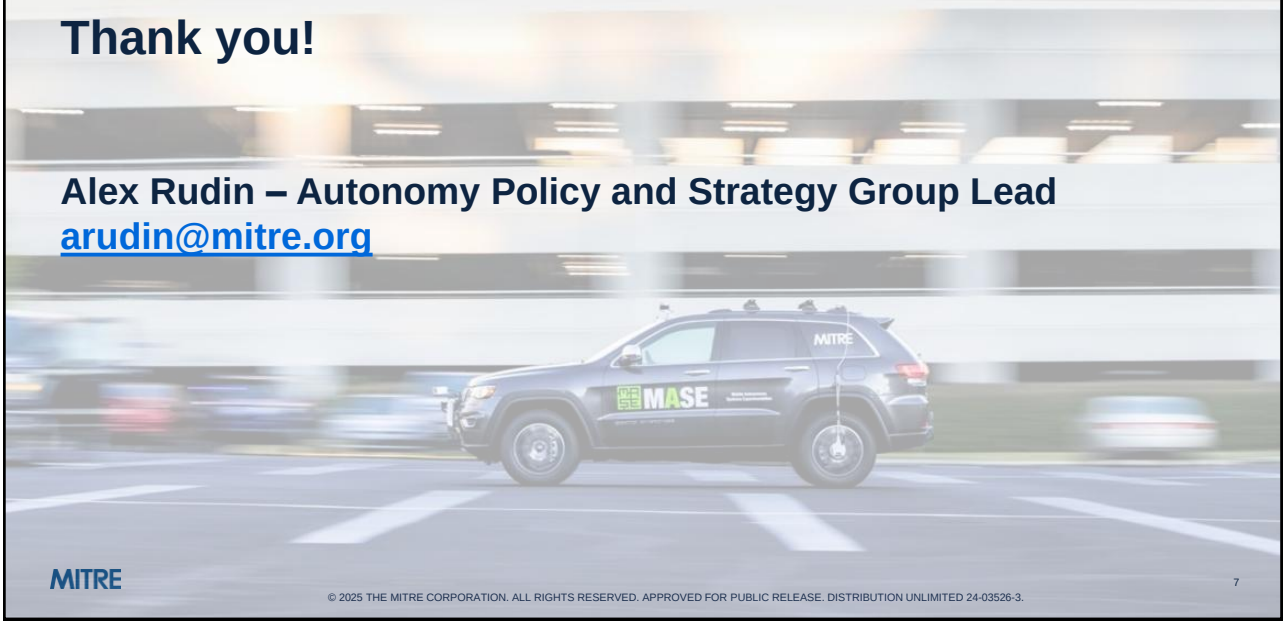

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