D.U.C.S. - Driverless Urban Car System

An NG-SAV Collaborative Project with Peking University and University of Toronto

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Purpose:

To establish a complete system for the global implementation of autonomous vehicles. Project scope includes inter-vehicle cooperation, efficiency maximization, control systems and hardware, business models, legality, and infrastructure design.

1. Adjustable interior seating for any type of comfort
2. Rotary drop doors allow full access to the vehicle and save room when parking
3. Flow simulations do determine vehicle train length (number of cars)
4. Sensors and their different ranges

CARS THAT SEE BETTER... AND LEARN AS THEY GO
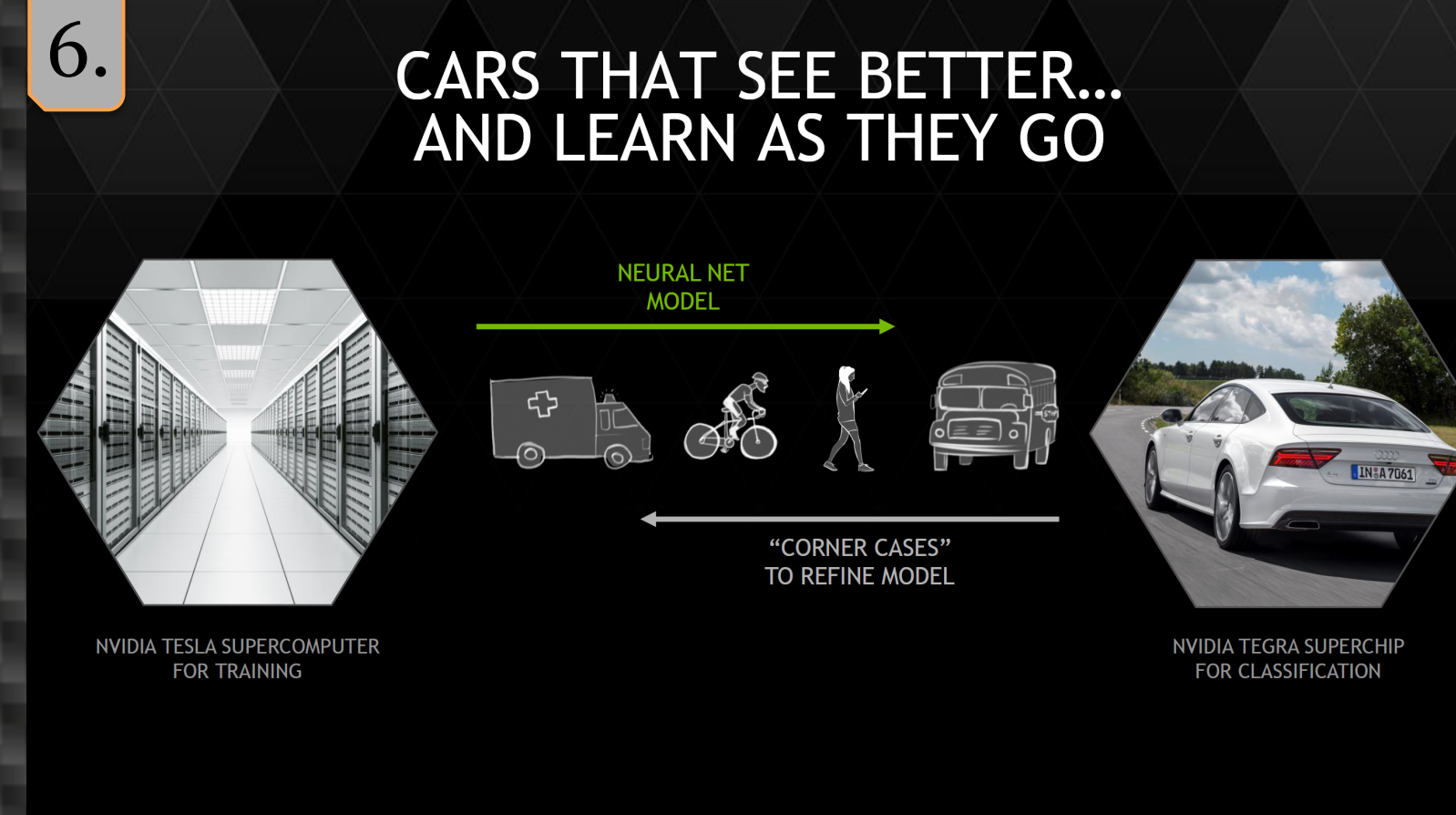
Final Result:

- Full technical paper detailing information on autonomy, legality, business model and infrastructure, controls, vehicle design, and hardware
- RC cars with custom body to represent aerodynamic shape future design
- RC car programmed to follow GPS coordinate route with second car utilizing an Arduino to follow in a vehicle train
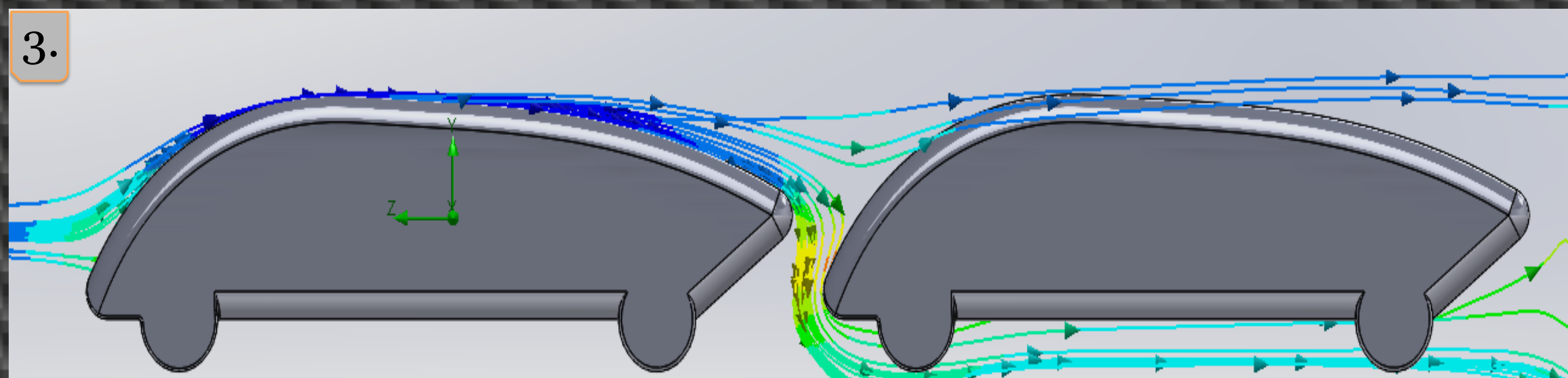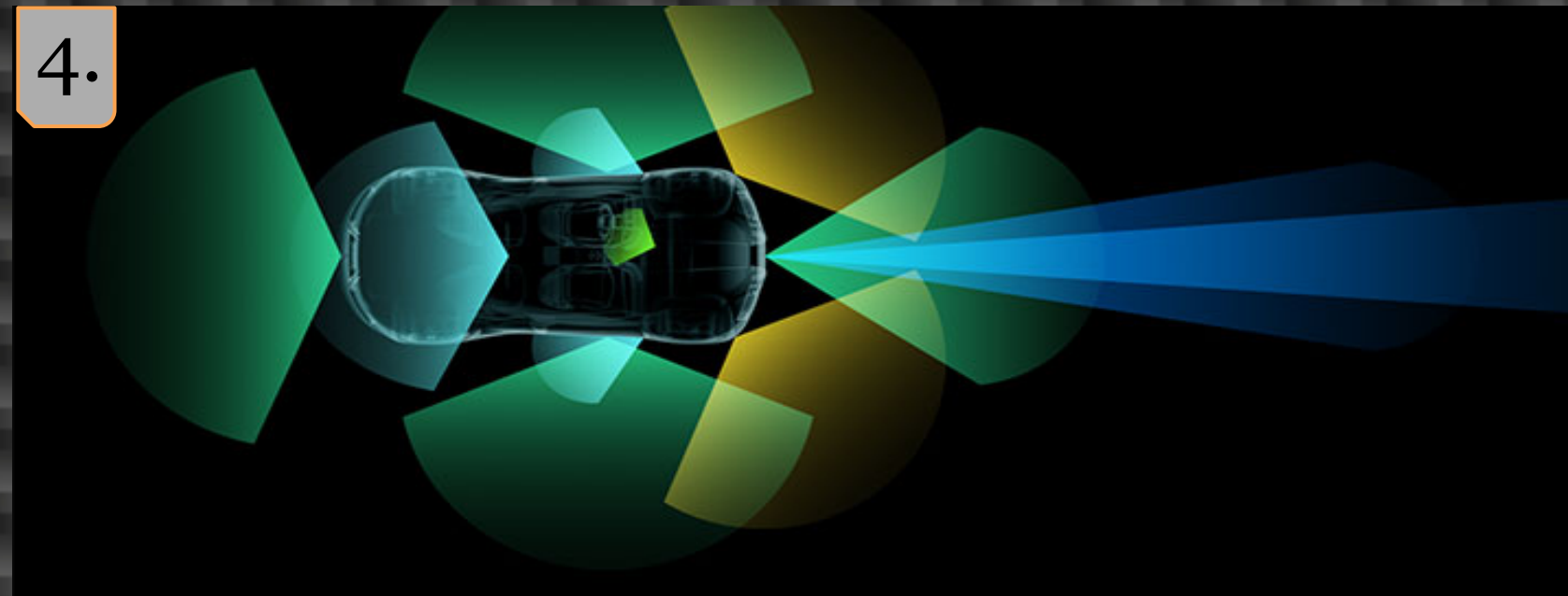
5. Nvidia Drive PX system with deep learning – visual representation
6. How Nvidia Drive PX learns
7. Passengers in Google's autonomous car. Note the lack of steering wheel

Vehicle Design

- Innovative aerodynamic shape for low drag and increased efficiency especially when following in vehicle trains
- Rotary drop doors means easy access for all ages and the disabled
- Configurable seating arrangement for comfort or greater storage
- Electrochromic glass- panel roof
- Fully electric with 70 mile range
  - Wifi Hotspot enabled

Autonomy and Controls

- Nvidia Drive PX deep learning computer hardware and software utilizing many sensors to see, learn, and adapt to the surroundings
- LiDar, Radar, Thermal Imaging, Stereo Cameras, and Ultrasonic sensors
- Both on-board and cloud based navigation
- Emergency stop button

Business and Infrastructure

- Can be sold privately to individual owners or as a taxi or fleet systems to companies and cities
- Sell both the autonomous system package to be installed on vehicles as well as our own vehicle design.
- Thousands of jobs created in building garages for storage, electric charging stations, and maintenance staff

Legality

- Current laws still have many restrictions on who can operate these vehicles
- Ability to have anyone be able to operate these with minimal safety training
- Vehicles must still have a steering wheel and emergency brake or stop button incase of malfunction
- Cars are already becoming more and more autonomous, we just have to let it choose