

Assessing Driver Performance and Understanding in Automated Driving Systems



To detect and to swerve...

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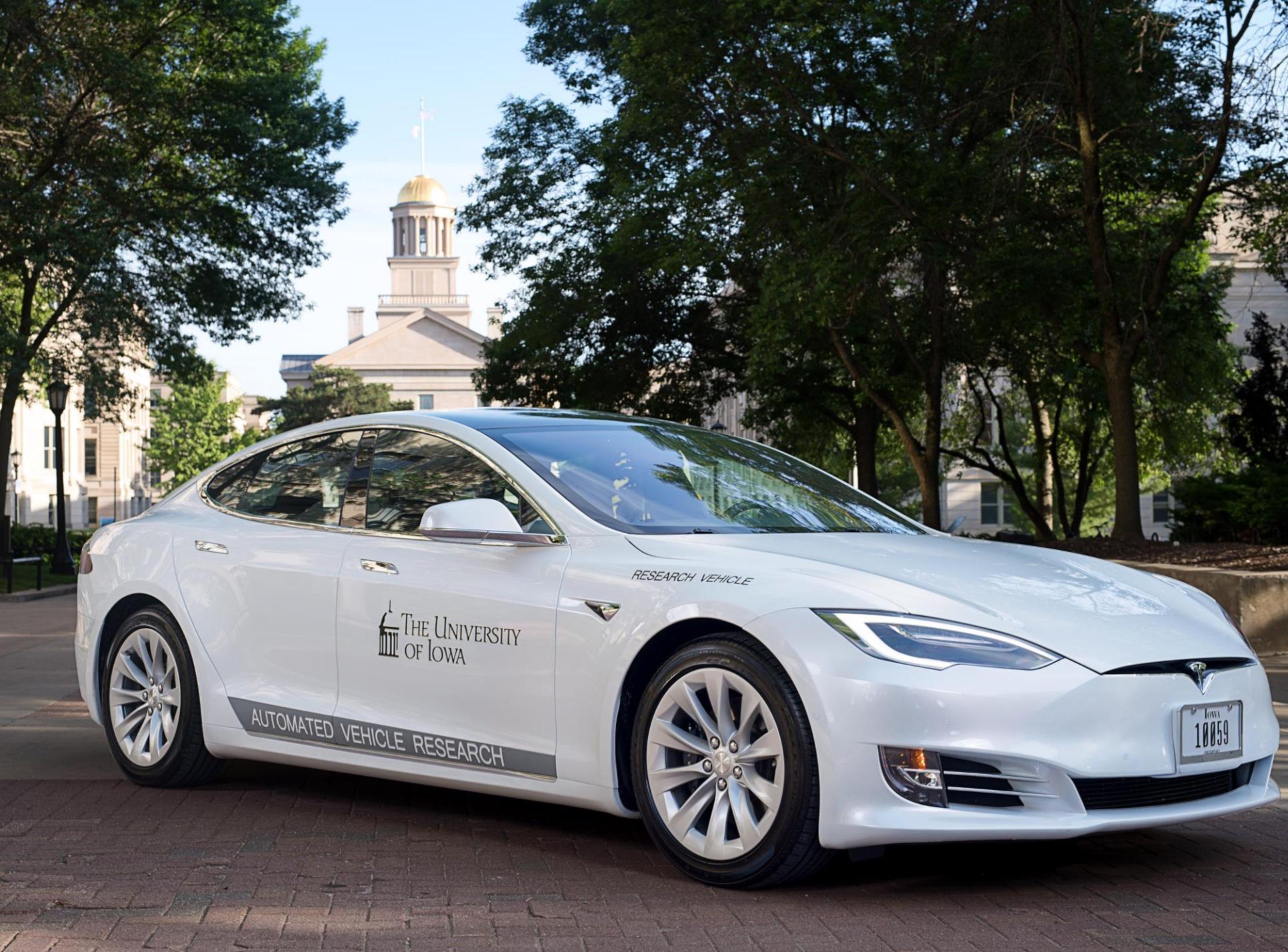
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University of Iowa National Advanced Driving Simulator





RESEARCH VEHICLE

 THE UNIVERSITY
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AUTOMATED VEHICLE RESEARCH

IOWA
10059

Naturalistic Driving



Broader context

- Mental model development of drivers and AVS



MyCar DoesWhat.org

Know More. Drive Safer.



Bridging the Gap With



Launched in October 2015 by University of Iowa and NSC



As of September, 2017 > 6.4 Billion Media Impressions



New Testing



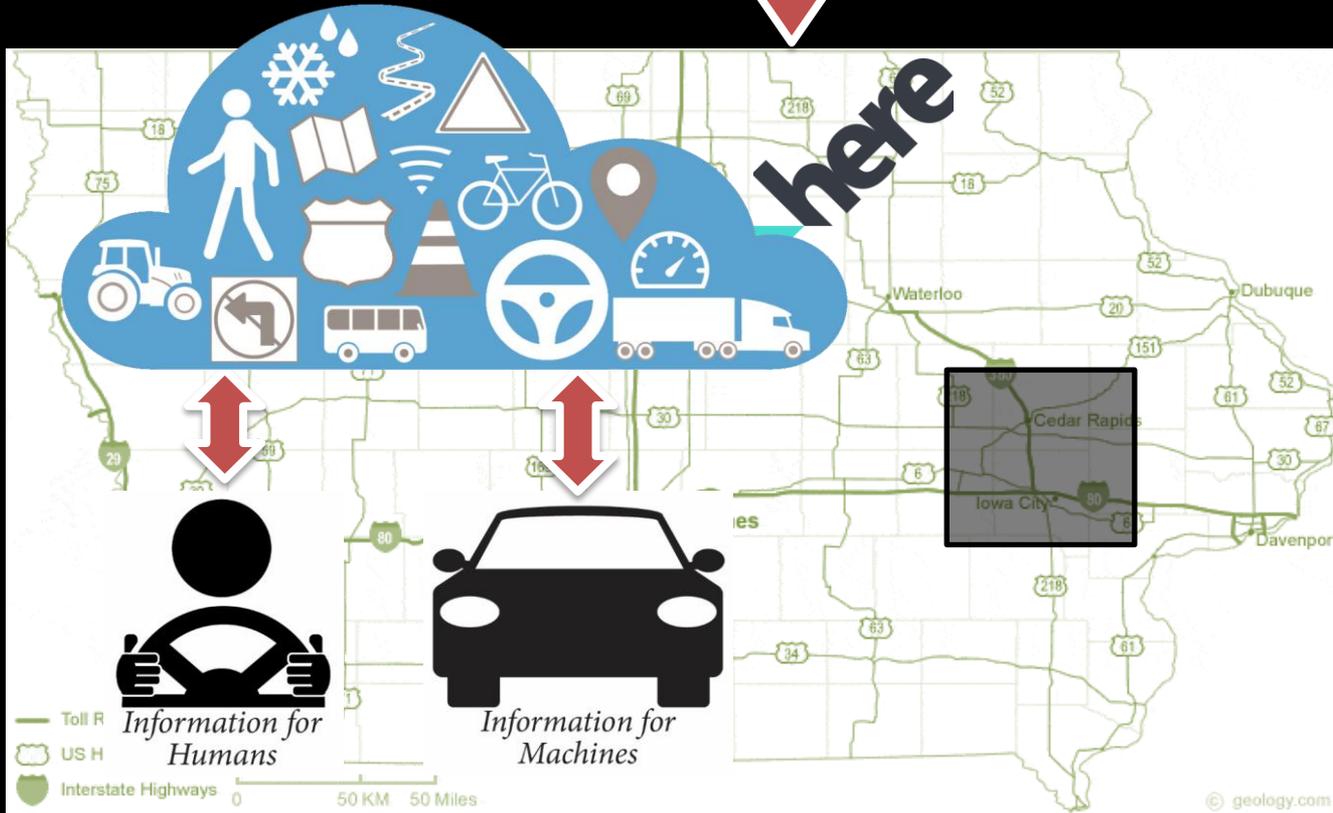
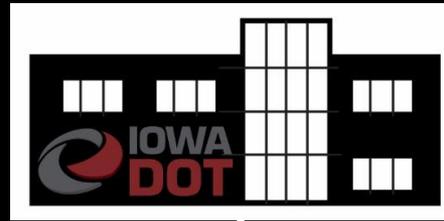
Iowa's Automated Vehicle Proving Grounds

AUTOMATED VEHICLE PROVING GROUNDS ACROSS THE US

1. City of Pittsburgh and the Thomas D. Larson Pennsylvania Transportation Institute
2. Texas AV Proving Grounds Partnership
3. U.S. Army Aberdeen Test Center
4. American Center for Mobility (ACM) at Willow Run
5. Contra Costa Transportation Authority (CCTA) & GoMentum Station
6. San Diego Association of Governments
7. Iowa City Area Development Group
8. University of Wisconsin-Madison
9. Central Florida Automated Vehicle Partners
10. North Carolina Turnpike Authority



Iowa DOT AV HD Mapping Data



Understanding driver state

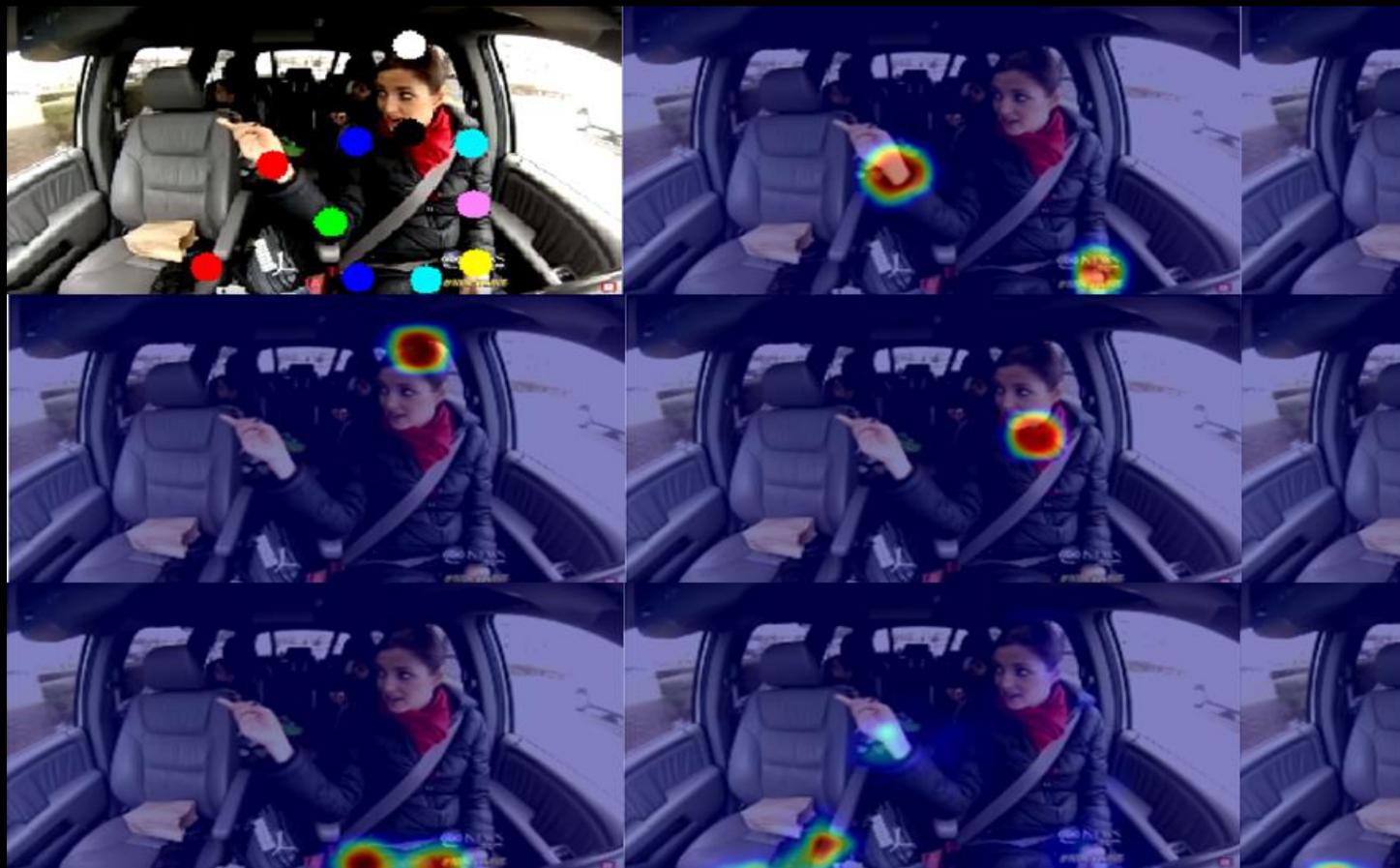


Deep Learning: Heat map of facial features and joints

- Prof Steve Baek, University of Iowa



(a)



(b)

Specific areas of interest

Pose



ankle



knee



hip



wrist



elbow



shoulder



chin



forehead



Real-time state detection



48 images from a 1.2MP camera
(handheld, unstructured)



3D Reconstruction integrating
48 cameras inside vehicle



Conclusions

- Many perspectives needed to understand and enhance driver mental models in AVS
- Understanding driver state in real-time critical
- Broad based education on ADAS and AVS principles also key



ありがとうございました

Thank you



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