Summary of the April 26, 2019 Workshop on Safety and Risks of Autonomous Vehicles

Panel on Advancing Safety Technologies for Autonomous Vehicles

United States Congress

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2044 Rayburn House Office Building

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Autonomous Vehicles: Features & Issues

- Remarkable and trendiest technology

- Obsolete car ownership

- Industry hope of "zero crashes"

- Leaders include Waymo and Tesla, Ford Motor Company, General Motors, Mercedes-Benz

- Traffic and pollution in urban centers

- Shared mobility options

- Slow advances on safety, risk and reliability

- Poor average distance driven to an incident

Workshop Objectives

Examine views from Academia, Government, and Industry:

- Safety, risk, security, and reliability of AVs

- Adequacy of road infrastructures

- Legal, ethical and regulatory considerations

- More safety research and technology needs

Big Picture for Self-Driving Safety

- True self-driving long time away
- Aspiration: Self-driving safer than conventional technologies
- Driver assistance offers a low hanging fruit
- More independent safety transparency and collaboration
- Need minimum performance standards
- Better autonomy software safety standards

http://bit.ly/2MTbT8F (sign modified)

From: Philip Koopman Presentation: The Big Picture for Self-Driving Car Safety

Maryland MDOT Initiatives

- Strategic Plan for Connected and Automated Vehicles (CAV Plan)

- Develop robust CAV, including:

  - CAV sensor collects data on bridges, roads, pavements

  - Use of predictive analytics

  - Integrated communications controllers and networks

  - Planning a Security Credential Management for secure management

Current TAMP plan includes:
- Inventory of pavement and bridges
- Assess historic condition information
- New assets being built

TRANSPORTATION ASSET MANAGEMENT PLAN

TRANSPORTATION ASSET MANAGEMENT

MDOT
MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

MDOT Administrator: Gregory Slater: Maryland Cybersecurity Initiatives in a Connected and Autonomous World

NHTSA Considerations for Automated Driving

- Evaluating emerging safety issues and technologies
- Building knowledge of new technologies
- Developing technology-neutral procedures
- Modernizing requirements and performance criteria
- Develop best practices guidance

From Dee Williams: NHTSA's FMVSS Considerations for Vehicles with
Automated Driving Systems

Measuring AV Safety

- Need a better and transparent evaluation of unsafe events
- Develop a protocol for information sharing
- Common safety design taxonomy
- Establish designated demonstration period for safety benchmarking
- More research on AV safety and collaboration between regulators, academics and industry

From Marjory Blumenthal: Measuring Automated Vehicle Safety: Building Better Outcomes and Policy
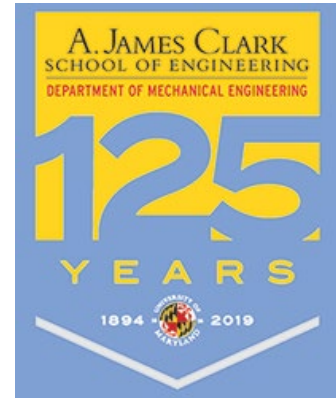
More Academic Perspectives on AV Safety and Risk

- Learn from other high-risk industries: nuclear power, pharma, etc.
- Risk-informed performance-based assessment
- Insufficient collaborations between stakeholders
- Match human cognitive adaptability and on-the-fly reasoning
- Need a gradual path to full AV
- Developers appear over-enthusiastic and confident
- Regulators and policy-makers are slow

More Academic Perspectives on AV Safety and Risk

- Safety analysts highly skeptical

- Major ethical issues

- Risk modeling, safety assessment path planning

- How machine learning techniques adapt themselves to unforeseen conditions?

- Is the policy that China views: Re-engineer entire road infrastructure better?

- Dedicated roads or lanes to AVs?

- Consensus: full autonomy principle is possible, surely not imminent

Thank You

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