Trust in Self-driving cars: From Absolute Safety to Informed Safety

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Agenda

- Introduction
- Self-Driving car: Challenges
- WMG Approach
  - Safety
  - Trust
- Summary
WMG: An Introduction

- An academic department within the science faculty
- Established in 1980 by Professor Lord Bhattacharyya as Warwick Manufacturing Group to facilitate technology transfer and knowledge creation for Industry
- 700+ people (800+ university and industry) working in 6 buildings
- Training over 1,500 individuals in the UK and abroad (from school to post experience)
- Co-located with Jaguar Land Rover & Tata Motors European Technical Centre
Some Challenges for Self-driving Cars:
In numbers
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2N. Kalra and D. G. Groves, *The Enemy of Good*. 2017
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**SAFETY**

**NEED IT NOW**

**TRUST**

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Safety: Identifying test scenarios

- Semi-structured interview study of Verification and Validation (V&V) experts in the industry from USA, Sweden, Germany, India, UK and Japan (across the automotive supply chain)

- Key findings:
  - For ADAS & AD: we need to test “how a system fails” as compared to “how a system works”
  - Need for a structured way to define test scenarios and test cases

- Proposed Hazard Based Testing

Citation: Khastgir, S. et al., “The science of testing: an automotive perspective,” SAE World Congress Experience 2018
Safety: Identifying test scenarios
Safety: Identifying test scenarios

ABSOLUTE Safety...

...is a MYTH!
TRUST
Trust in Self-driving cars

- Over 100 participants across two driving simulator studies
- Information can be provided to create:
  - Skill-based behaviour
  - Rule-based behaviour
  - Knowledge based behaviour

For Automation: we need Knowledge based behaviour

Trust in Self-driving cars

- Information imparted:
  - Static
  - Dynamic

- Content:
  - Capabilities of Automation
  - Limitations of Automation

- Focus: *Reason for the limitation*
Informed Safety
Absolute Safety is a myth… aim should be Informed Safety

Demonstrating safety remains a key challenge. It is not about the number of miles, but about the number of “smart” miles.

Hazard based testing to identify the “interesting” scenarios. Systems’ approach required to identify “how systems fail”

Absolute safety is a myth!

Informed Safety is a key ensuring appropriate use of technology and introducing it now!

Success will be dependent upon suitable collaboration and data sharing, nationally and internationally.
Thank you...

Discussion...

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