Intelligent Vehicle Dependability & Security (IVDS) Project
Final Status Presentation

IFIP Working Group 10.4
Winter 2024 Business Meeting
Saint Simon's Island, Georgia, USA
4 February 2024

The views expressed in this presentation do not necessarily reflect those of the IVDS project members' affiliations.

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IVDS Project Team

During the 4.5-year duration of the project, the following individuals made significant contributions to the project's success.

Jaynarayan Lala (Project Lead), Raytheon, an RTX Business, US jay.lala@rtx.com
John Meyer, University of Michigan, US jfm@umich.edu
Carl Landwehr, University of Michigan, US carl.landwehr@gmail.com
Charles Weinstock, Carnegie Mellon University, US weinstock@conjelco.com
Homa Alemzadeh, University of Virginia, US ha4d@virginia.edu
Wilfried Steiner, TTTech, AT wilfried.steiner@tttech.com
Cristina Nita-Rotaru, Northeastern University, US cnitarot@gmail.com

Acknowledgements

The IVDS team wishes to express its appreciation of the support provided by WG 10.4's leadership and members throughout the duration of the project.

Our sincerest thanks also to the speakers and panelists of the two IVDS workshops and the IFIP 60th Anniversary panel, and to all those who attended these events or otherwise contributed behind-the-scenes to the project's success.

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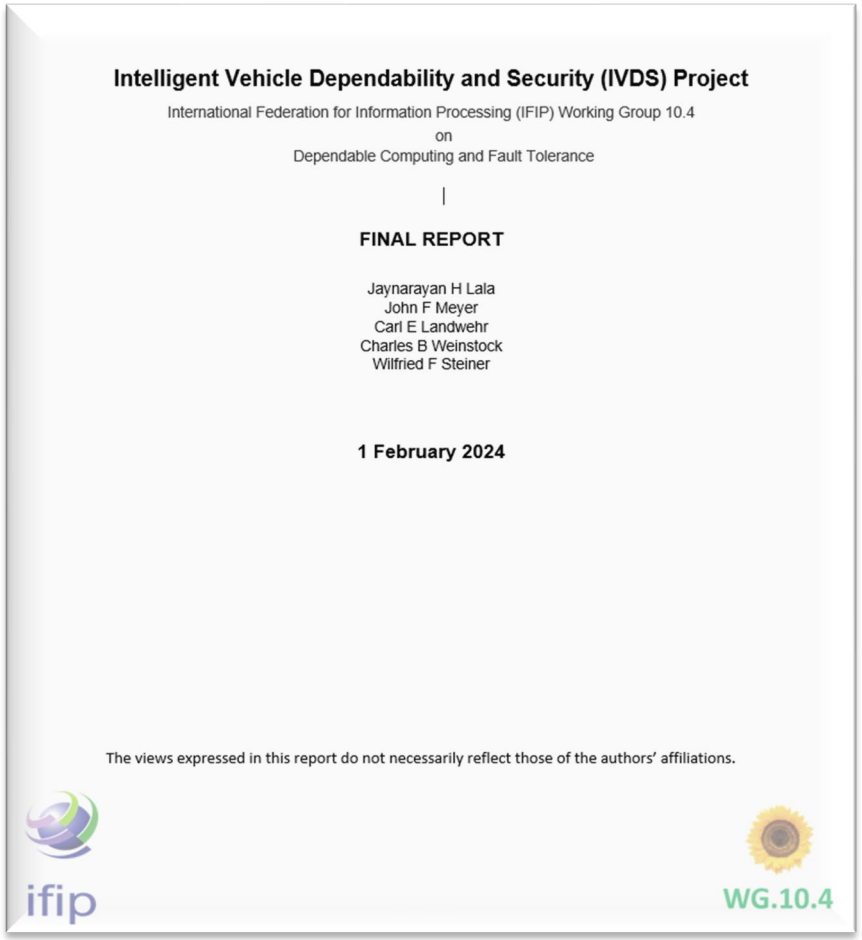
IVDS Project Final Status Update

- IVDS project, approved during the June 2019 meeting of IFIP Working Group 10.4, has concluded.
- A 15-page final report has been prepared and has been distributed to the working group.



Intelligent Vehicle Dependability and Security (IVDS) Project

International Federation for Information Processing (IFIP) Working Group 10.4
on
Dependable Computing and Fault Tolerance

FINAL REPORT

Jaynarayan H Lala
John F Meyer
Carl E Landwehr
Charles B Weinstock
Wilfried F Steiner

1 February 2024

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IVDS Project Web Site

- All project outputs have been organized into an easily accessible website.
- The corpus of knowledge also includes many relevant safety standards.

https://ivds.dependability.org

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Major Findings

- There are significant shortfalls in technologies, cost, governance, and societal aspects in achieving the end goal of safe and secure SAE Level 4 or 5 self-driving intelligent vehicles.

- However, with sufficiently restrictive Operational Design Domains (ODDs), good progress is being made toward Level 4 autonomy.

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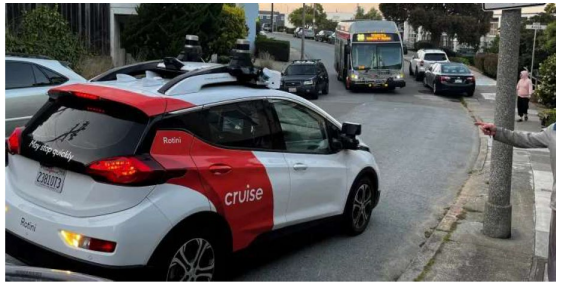
Recent Developments Support Findings

- Driverless (L5) taxi permit for a major autonomous vehicle manufacturer and operator, GM's Cruise, was cancelled by the state of California.
  - Operator recalled vehicles in all cities in the US and is reconsidering its autonomous vehicle strategy.



This Cruise in San Francisco seemingly could not figure out how to pull aside on a narrow street to let a buss pass.
Matt Rosoff, CNBC

- US National Highway Traffic Safety Administration (NHTSA) recently issued a recall of more than 2 million Tesla vehicles to ensure drivers are paying adequate attention when "autopilot driver assistance system" (L2) is activated.
  - Per NHTSA, these functions should only be available on divided highways.

- GM is reportedly reconsidering its Ultra Cruise development.
  - GM introduced Super Cruise, hands off driving, on divided highways in 2017.
  - Ultra Cruise is supposed to offer same functionality on 95% of US and Canada roads.

Recent Developments Support Findings (Cont.)

- A McKinsey & Co survey of 86 stakeholders reveals that “2023 was a tipping point for the autonomous-vehicle industry”
  - Critical technology challenges: Prediction & decision making; Perception software
  - Leading players saw “….significant setbacks, stopped or reduced their operations, or exited the market entirely.”
  - “The timeline for autonomous-vehicle is extending.” L4 robo-taxis are expected to become commercially available at a large scale by 2030.

Survey respondents continue to see software elements as the most critical technology for autonomous vehicles, at almost double the average ranking.

Share of respondents seeing technology as most critical,[1] %

	Overall	North America	Europe	Change from 2021
Prediction and decision making	76	92	64	→
Perception software	72	83	71	→
Back-end operations	40	42	36	→
Radar	40	38	43	→
Control unit	38	42	36	↑
Light detection and ranging	34	42	21	↓
Development tools	34	33	36	→
Camera	31	42	29	→
System on chip	17	25	14	→

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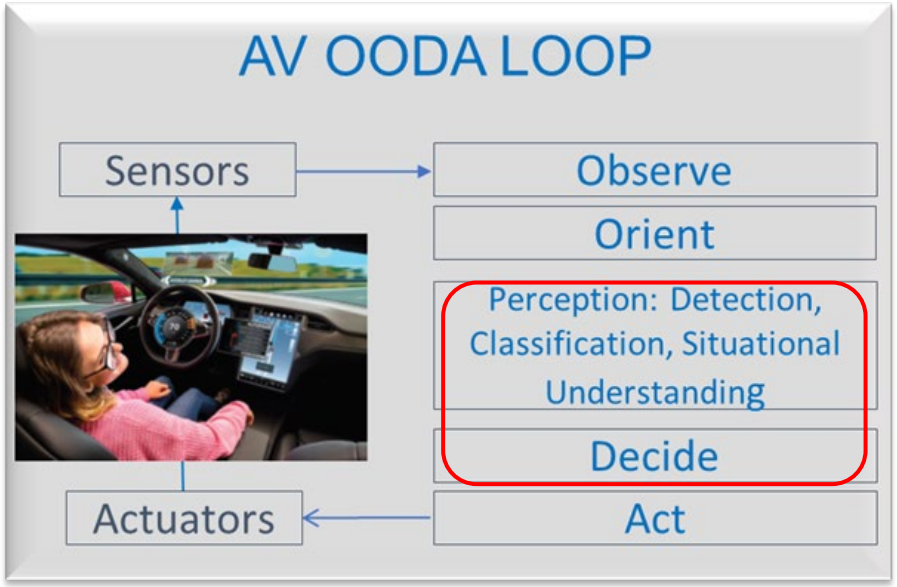
Conclusions & Path Forward

- IVDS project mission was to facilitate awareness and provide pro bono counsel to both automotive stakeholders and relevant standardization/regulatory bodies.
- The project largely accomplished the mission.
- Going forward, it is evident that the paradigm of “moving fast and breaking things” is not the right approach to replace human-driven vehicles with autonomous vehicles,
  - just as it wasn’t for aviation at the dawn of the jet age.
- A path exists to realize the end-state of road transport that is just as safe as aviation, if we learn the lessons from aviation community about how to design, build, test, validate, operate and regulate safety-critical systems.



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Backup

Vision, Mission and Objectives

Vision: Safe, secure and dependable operation of intelligent and autonomous vehicles

Mission: Provide thought leadership by engaging stakeholders to increase awareness of dependability and safety requirements, promoting technical solutions, and providing expert help to governance and regulatory bodies in their rule-making and oversight roles

Objectives:

1. Increase Awareness of Stakeholders: Invite government and industry stakeholders and researchers to workshops; Meet with them in their own environment;
2. Promote Technical Solutions: Hold DSN & WG10.4 workshops focused on dependability & security requirements, key design challenges, certification & validations, and other relevant topics
3. Engage Governance and Regulatory Organs of Governments and Industry Standards Bodies: Provide expert help in defining requirements, certification methods.

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Specific Goals

1. Measures
2. Standards
3. Employment of Machine Learning Algorithms
4. Key Design Methods
5. Assurance and Certification

Goal descriptions are in the Sept 2019 white paper and the project's final report.