

Capri^o

Pod roadmap: Future of Virtual Verification

Capri WP4 partners: T&VS, Warwick

T&VS view on: Future of Virtual Verification.....1

- The continuously improving test procedures in response to evolving autonomous vehicles should gradually lead the way to **sophisticated test facilities**, which
 - Standardize the test generation and testing procedures
 - Centralize database to collect inputs from various researches such as accidentology
 - Interconnected test labs to provide easy access to autonomous vehicle manufacturers
 - Continuous evolution by **specialization and generalization** of test-bench
 - Specialize to meet specific requirement of ACS testing
 - Generalize to evolve and use the solution for a wider perspective
 - **Standardization** based on various standards and best practices, continuously expanding with inputs from regulatory bodies
 - **Safety and Security** enabled simulations
 - Verification and certification for complete development lifecycle of autonomous vehicle
 - **Continuously evolving and diversifying eco system:** adding more scenarios that includes different terrains, variety of junctions, vehicle type, road markings, sign& signals and obstacles for a longer duration, overall widening the scope of test-bench

T&VS view on: Future of Virtual Verification.....2

- Variety of test methodology and graphical interface for test generation
- **Integration and consolidation** of test data and results in a unified databases originating from physical trials, closed-course testing and virtual verification
- Variety of tests starting from sensors testing to fleet management testing
- Unified body and interface to ease permissions and grants from government
- **Flexible report generation** and coverage to satisfy various industry requirements
- Multidisciplinary facility that includes variety of companies, institutions, designers, developers and research scholars
- A variety of simulators, maps and tools to facilitate testing

Warwick view on: Effective Cybersecurity Testing for the Future

- Standardisation to accelerate future testing
 - Standardise the testing procedures based on best practices, guidelines, and standards
 - Develop databases of tools, equipment, scenarios for tests
 - Standardise useful metrics for testing
- Develop effective data-sharing platforms
 - To collaborate between companies/organisations who are involved in CAV cyber security testing
 - Invest in digital twin infrastructures to extend the test capacity and accelerate the test
 - Optimise the data logging for security purposes
 - Sharing data and document the testing
 - Test cases from previous projects should be collated and analysed to provide a comprehensive view of the landscape and literature gap
- Extend the test capacity, scalability, and complexity
 - Make uses of existing testing facilities
 - Recognising new market-driven technologies to increase the testing diversity
 - Create useful ecosystems for testing
 - Improve the coordination between testing centres to extend the capacity with more facilities, expertise, etc.
 - Develop open-source software and hardware-in-the-loop simulation tools

Thank you

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