ATLANTA
ITS WORLD CONGRESS 2025

SAKURA safety evaluation framework and future expansion for E2E AI system

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DEPLOYING TODAY, **EMPOWERING TOMORROW**

Background: government initiative in Japan

- Japanese Ministry of Economy Trade and Industry (METI) has compiled "**Mobility DX Strategy**“ to accelerate digitalization and SDV deployment, and the strategy defines seven areas needs to be solved by public-private coorperation.
- Japanese Ministry of Land Infrastructure Transportation and Tourism(MLIT) has compiled “**Guidelines for Ensuring Safety of Autonomous Vehicles**"

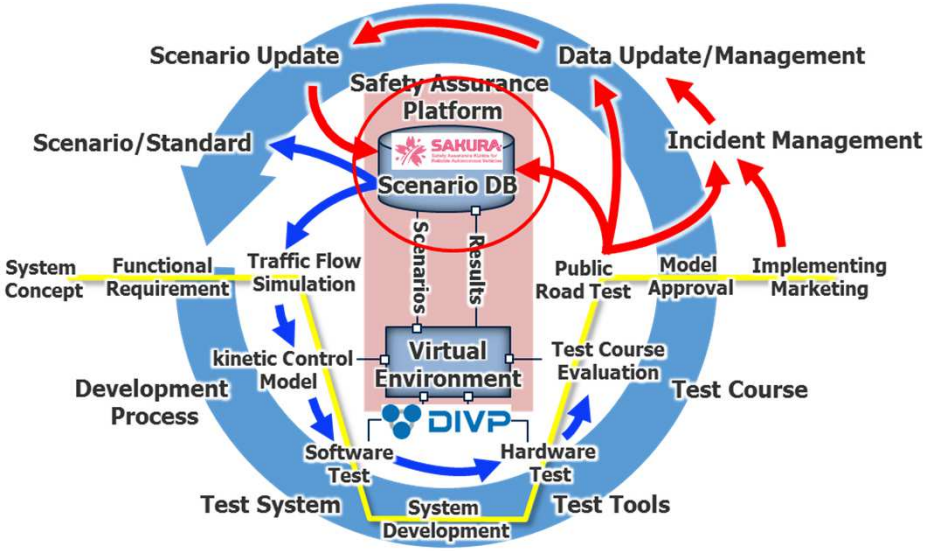
Overview of SAKURA project

◆About

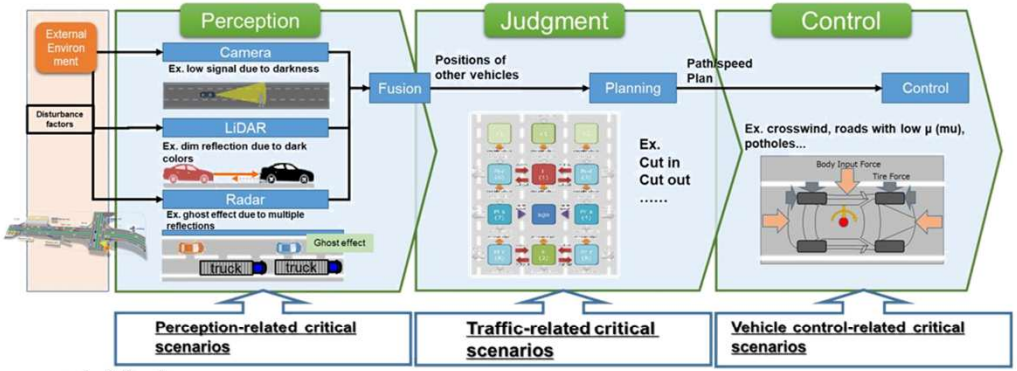
- Sponsored by Japanese government (METI)
- Duration : FY18-20 (Phase1), FY21-25 (Phase2)

◆Project Aim

- Establish a safety evaluation eco-system
- Develop Scenario-based safety assurance framework and platform
- Coordinate standardization activities with JAMA and academia: ISO3450X

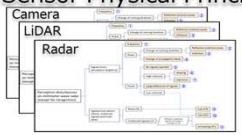


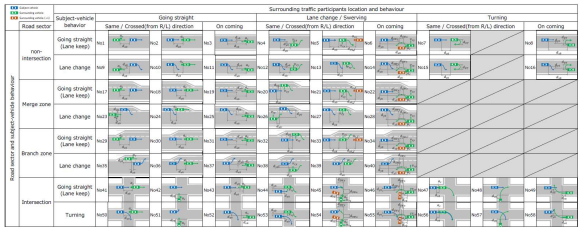
Summary of SAKURA Scenario and C&C driver model

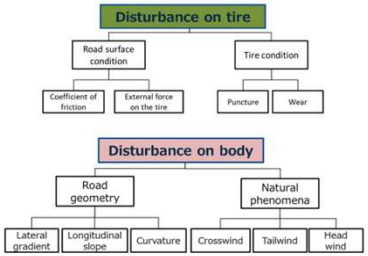


Environmental factor

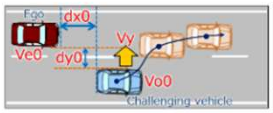
Sensor Physical Principle





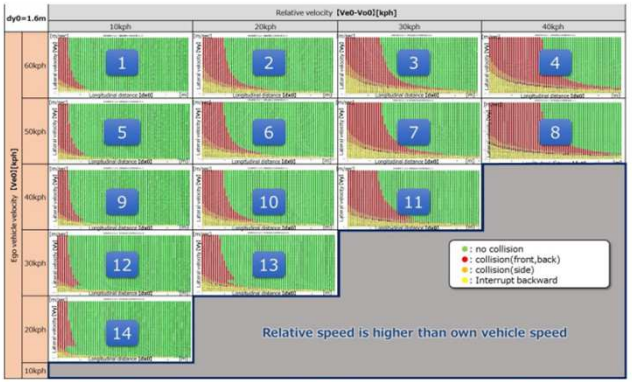


Reasonably foreseeable scenario catalog



Initial condition	Initial velocity	[Ve0]	Ego vehicle velocity
		[ve0-Vo0]	Relative velocity
	Initial distance	[dy0]	Latteral distance※
		[dx0]	Longitudinal distance
Vehicle motion	Lateral motion	[Vy]	Lateral velocity

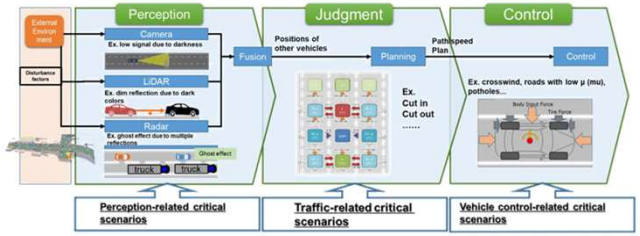
※Latteral distance
ex) Lane width : 3.5[m]
Vehicle width:1.9[m]
Driving in the center of the lane
dy=1.6[m]



Preventable boundary

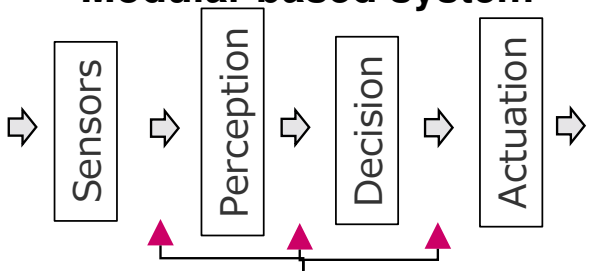
Competent & Careful human driver

Safety evaluation framework in E2E AI context



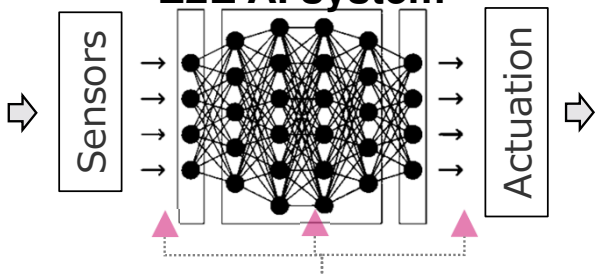
Scenarios

Modular based system



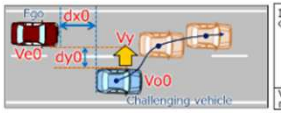
Checkpoints could be defined

E2E AI system



Difficult to define checkpoints

ADS performance



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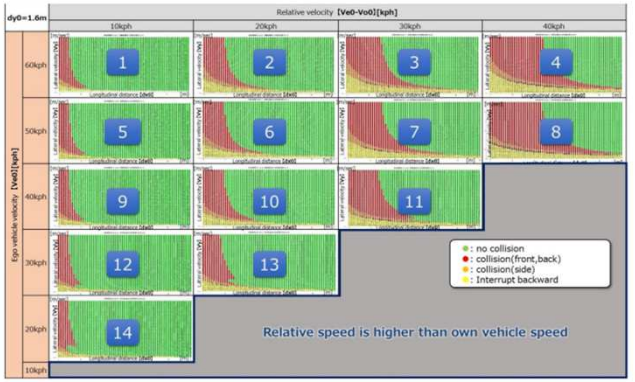

Discussion points

- Checkpoints for E2E-AI
  - Can E2E AI logic be decomposed and validate in subsystem level?
- Representativeness of test cases
  - Can same test cases be applied for E2E-AI ADS as modular based ADS
- What should be regulated/standardized and to what extent?
  - Is audit of training datasets necessary? and how?
  - Can tactical behavior be standardized or regulated?

Questions & Answers

Thank you