

# SUDA LAB.

## Dynamics and Control of Vehicle

Advanced Mobility Research Center (ITS center)  
Department of Mechanical and Bio functional Systems



Dynamics and Control of Vehicle

Department of Mechanical Engineering, Graduate School of Engineering /  
Interdisciplinary Information Sciences Course, GSII

<http://www.nozomi.iis.u-tokyo.ac.jp/>

### Study on Mobility Systems with Advanced control, Multi-body Dynamics, Human Factors, Vehicle system applied AI, for Sustainable Mobility.

#### 1. Analysis and optimization of human-vehicle-infrastructure boundary area

Dynamic analysis and Modeling of Vehicle with Multi-body dynamics, Contact mechanics of Wheel/Rail and Tire/Road, Dynamics Control and monitoring in Boundary area, R&D of HMI (Human / Mechanical system), Improvement of curving performance for railway vehicle, Free access Platform Gate

#### 2. Study on Driver Characteristics and Automated Driving

Steering performance a motion just as intended by a driver, Truck automated driving and Platoon project, Practical study of Automated Driving Bus

#### 3. Study on transportation system of new method

Clarification of social significance, Basic performance evaluation of vehicle, Ecosystem considering the whole system from control system design to operation, R&D in consideration of technical standards and legal maintenance for practical use (PMV, eco-ride ...)

#### 4. Study on mobility with AI and biological information measurement

Machine Learning and Big Data Analytics, Detection of vehicle abnormal state and derailment, Evaluation method of driving skill by driver behavior and brain activity measurement

#### 5. Study on comfort and social acceptance in mobility

Engineering research group activity on comfort, Comfort evaluation of railway vehicle, Quantitative evaluation method, Seat arrangement of commuter train and automobiles, Evaluation of social acceptability by business ecosystem

#### 6. Integrated research of ITS (Intelligent Transport Systems) and advanced mobility

Sustainable ITS project, Development of mixed reality transport experiment space, Tohoku Reconstruction Energy and Mobility Management, Parking lot ITS project, Mobility Innovation Collaborative Research Organization, The University of Tokyo (UTmobl)

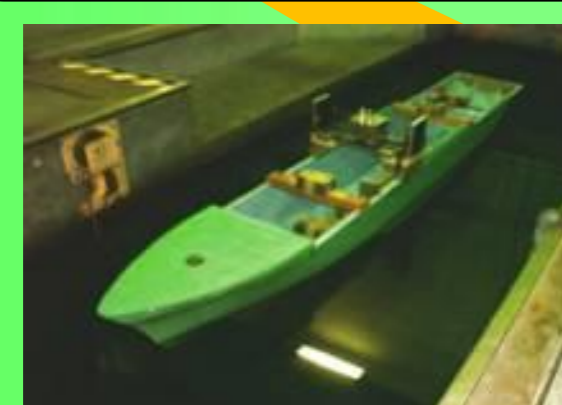
#### 7. Regional Collaborative Research / International Collaborative Research for Social Implementation

Kashiwa City (Kashiwa ITS Promotion Council), Nagasaki Prefecture, Hiroshima City (ASV Project in Hiroshima), Ishinomaki City...

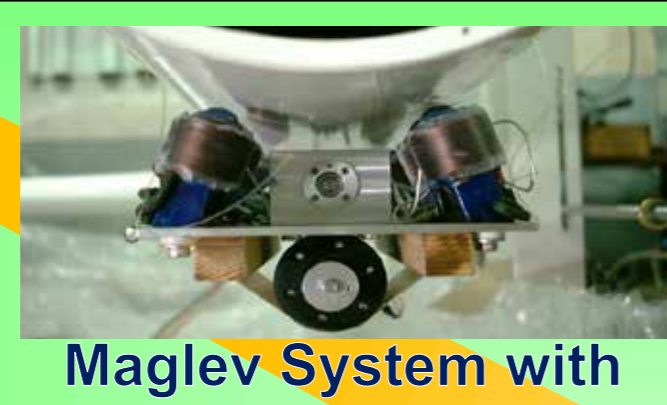
#### 8. Development of Proving Ground for Advanced Mobility Research

Driving simulator, Railway test track, Test field for automobile and road traffic, Traffic light

#### Multibody Dynamics and Control



Ship Anti-Rolling System with Self-Powered Active Control



Maglev System with Controlled Damper



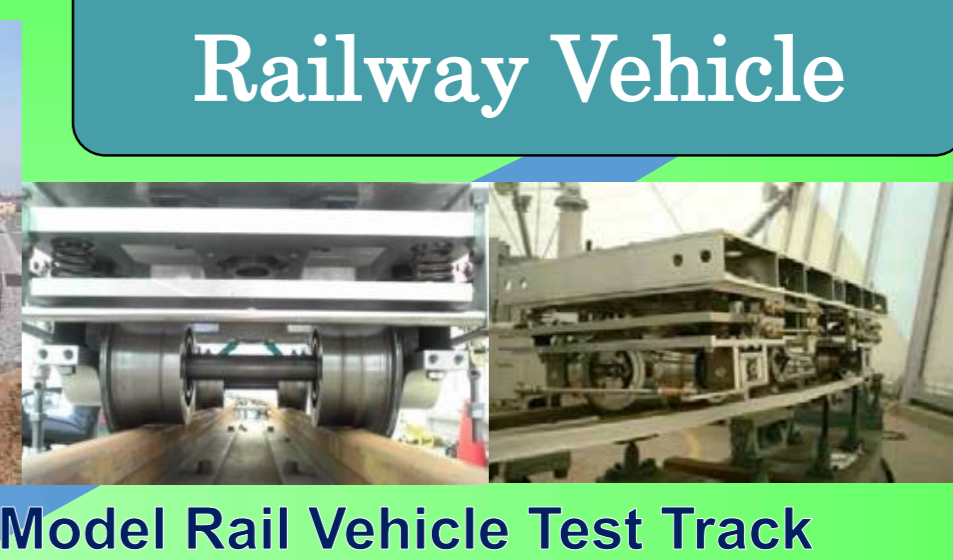
Eco transport system "Eco Ride"



Real scale vehicles for experiment and education



Full and Scaled Model Rail Vehicle Test Track for Innovative Designed Railway Truck



Railway Vehicle



Tire Test Machine



ASV Project in Hiroshima



Energy-Saving ITS



Variable-boarding-location-type Automatic Platform Gate



Railway Vehicle Mockup for Study on Comfort



Electro Magnetic Suspension



Experimental Traffic Light



Automated Driving Bus



Narrow tilting vehicle



Personal Mobility Vehicle



Driving Simulator with 6 d.o.f motion, Turntable & 360° Full Screen



Driving Simulator with Truck Cabin

#### ITS & Automobile

#### Comfort and Human Interface

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