

Nagoya University Summer Intensive Program

Started in 2008

Events

1. Automobile Engineering
2. Elementary Japanese
3. Factory Visits
4. Cultural Tours
5. Home Stay

Language

English



JAPAN

2008 Summer Intensive Program at Nagoya University
June 02-July 11, 2008

Latest Advanced Technology & Tasks in Automobile Engineering

Elementary Japanese

Language: English
Place: Nagoya, Japan
Inquiries & Applications: International Office of your University
Application Deadline: February 15, 2008

WEBSITE • <http://www.engg.nagoya-u.ac.jp/en/nusip/>

<p>Current Trends in Automobile Engineering and the Car Industry Towards Environmentally Friendly Cars: Fuels and Exhausts Observation and Evaluation of Driver's Behavior Car Materials and Processing Safety Engineering for the Prevention of Accidents Crash Safety Automotive Embedded Computing Systems</p>	<p>Communication Technologies in ITS CAE Activity in Vehicle Development Energy Saving Technology for Automobiles Recycling Car Production Systems Individual Research Projects</p>
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Why Japan ?

Car innovation from Japan



Hybrid car **PRIUS** (Toyota)



Hybrid car **INSIGHT** (Honda)



Electric car **i-MiEV** (Mitsubishi)



Electric car **LEAF** (Nissan)

Participants

1. Overseas Students
2. Nagoya University Students

In 2008 (USA12+NU25)

U. of Michigan (6), North Carolina State U.(4), UCLA(1)
U. of Kentucky (1)

In 2009 (USA25+UK3+France2+NU20)

U. of Michigan (13), Southern Illinois U.(2), UCLA(9)
U. of Kentucky (1), U. of Strasbourg(2), U. of Warwick(3),

In 2010 (USA26+China4+NU19)

U. of Michigan (12), Southern Illinois U.(2), UCLA(1)
U. of Kentucky (2), North Carolina State U.(4),
U. of Illinois (5), Hong Kong U. of S&T(3), Tongji U.(1)

Automobile Engineering

Latest Advance Technology & Tasks in Automobile Engineering

Lecture Title

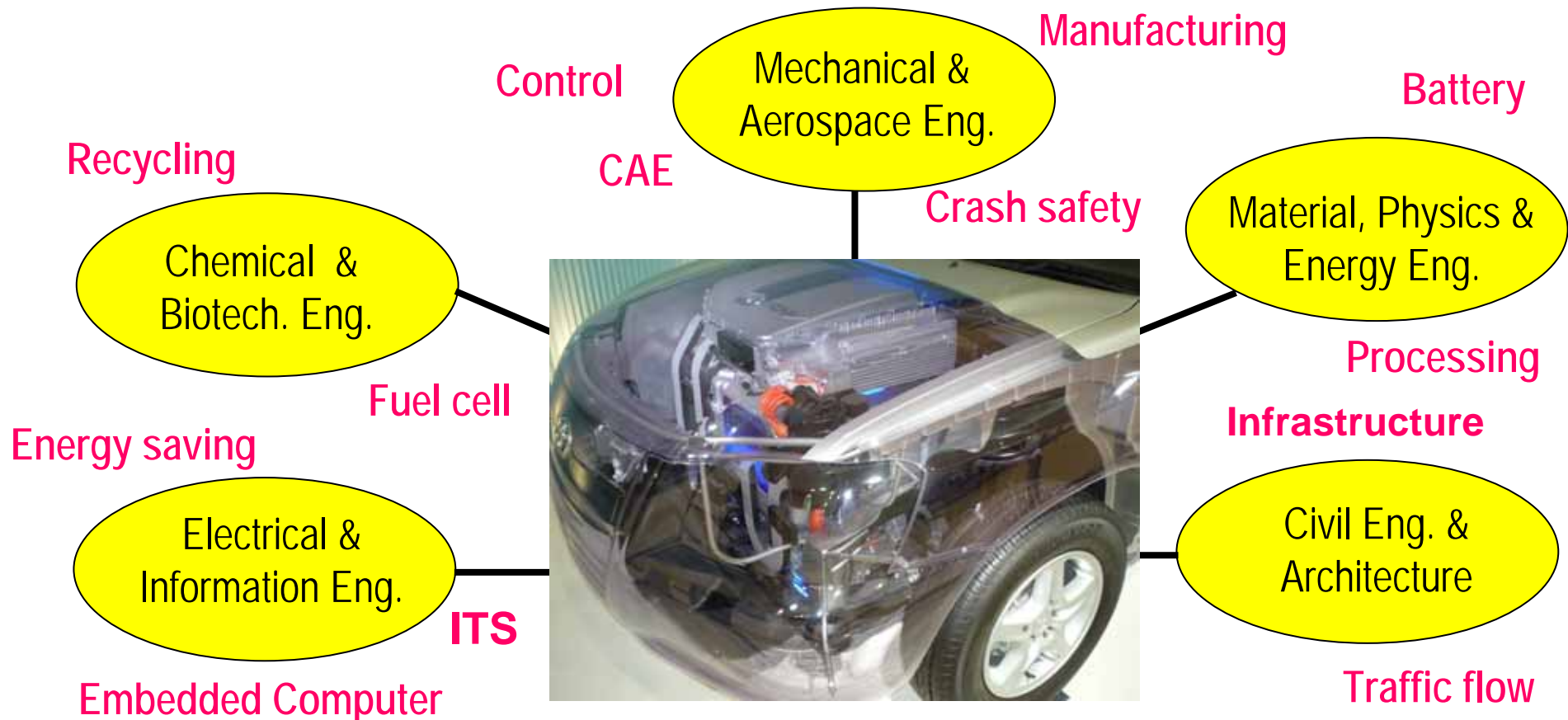
- Current trend of automobile industry
- Material and processing
- Prevention of accidents
- Computing system
- Drivers behavior
- Fuel and Catalyst
- Energy Saving technology
- Motion Control
- Crash Safety
- ITS
- Recycling
- Production system

Lecturer

Nagoya University / Toyota / Denso / Nissan /
Mitsubishi Motors / Toyota Central Research Lab./
Mitsubishi Electronics

Addressing the Future Car Technology

- An interdisciplinary contents with experts from companies and departments
- Wide range of subjects
- Consideration to the environment and safety issues.



1 . The Car Industry, Market Trend, Circumstance and Its Future

Lecturer : Mitsubishi Motors Corp. & Nagoya U.

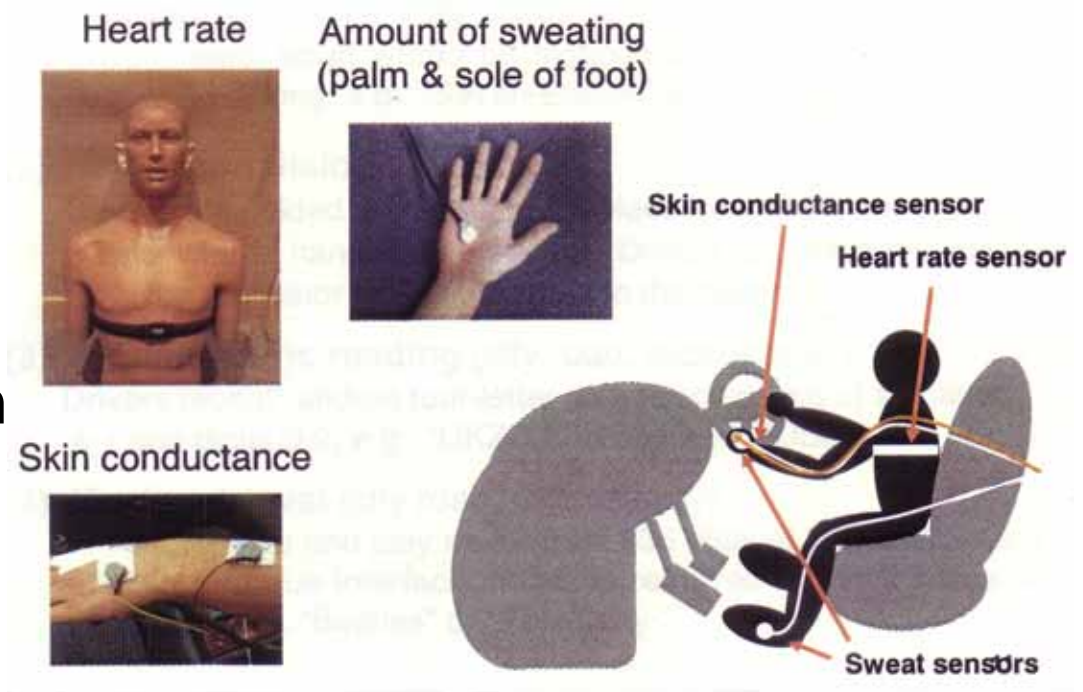
1. Global Market Trend by Region
2. Development Process
3. CO2 Regulation
4. Safety Features
5. Cars in Future
6. Electric Vehicles



2. Observation and Evaluation of Drivers' Behavior

Lecturer : Tokio Marine & Nichido Risk Consulting Co.,Ltd. & Nagoya U.

1. Collection of large-scale multimodal data in real-world driving
2. Driver identification
3. Driver identification
4. Detecting dangerous traffic
5. Dangerous driving
6. Diagnosis of driving risk
7. The correlation between accident and diagnosis

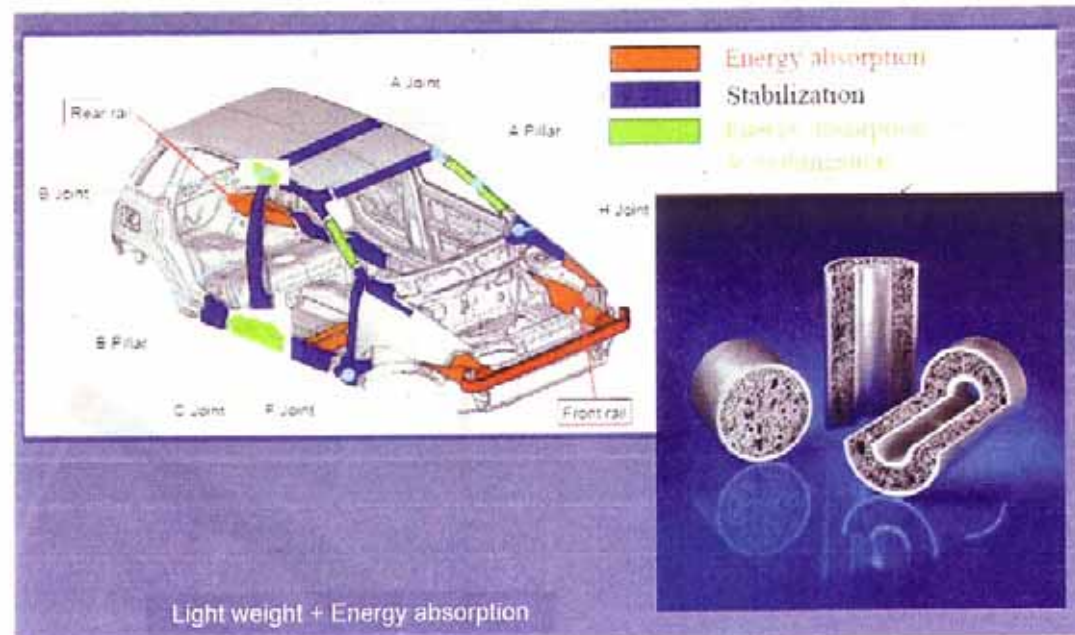


3 . Car Materials and Processing

Lecturer : Nissan Motor Corp. & Nagoya U.

1. Manufacturing innovation for forging process
2. Car Materials and Deformation Processing

Metal foam

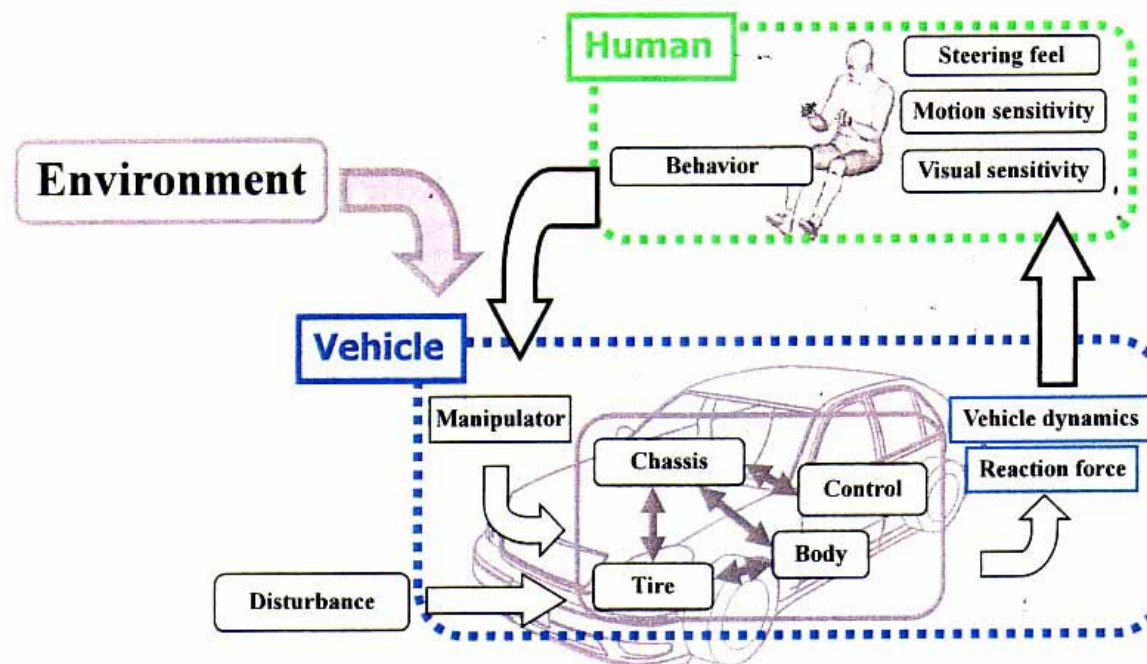


4 . Movement and Control of a Car

Lecturer : Toyota Central R&D Labs., Inc. & Nagoya U.

1. Modeling of Vehicle Dynamics
2. Design of Vehicle Dynamics Control

Human-Vehicle closed loop system



5 . Safety Engineering for the Prevention of Accidents

Lecturer : Nissan Motor Corp. & Nagoya U.

1. Fatal/serious injuries involving Nissan's vehicle (Japan)
2. Effort toward accident reduction
3. Definition of Safety Shield
4. Deterministic Modeling of human driving behavior
5. Stochastic Modeling of human driving behavior
6. Fault tolerant control design
7. Innovative Safety Conception in Nissan

Two cases of turning-right

Decision of turning-right is detected when the braking is released!!

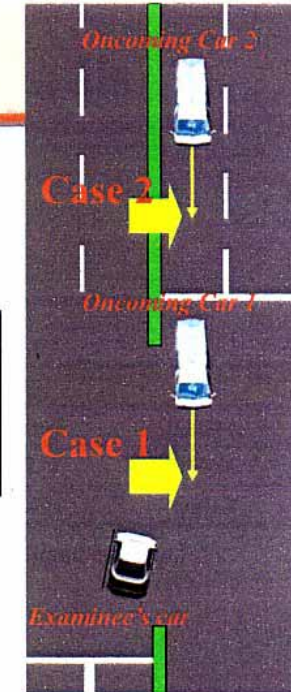


There are two cases of turning-right.

- Case 1** : Turning-right before the Oncoming Car 1
- Case 2** : Turning-right between the Oncoming Car 1 & 2

We model each case separately!

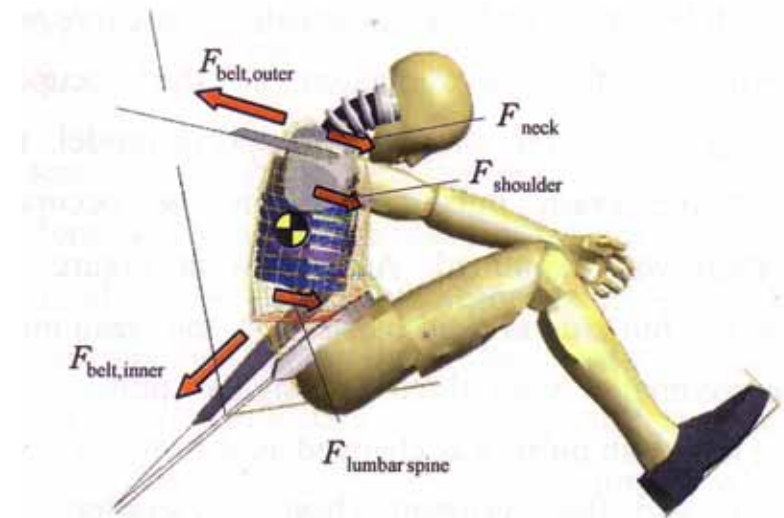
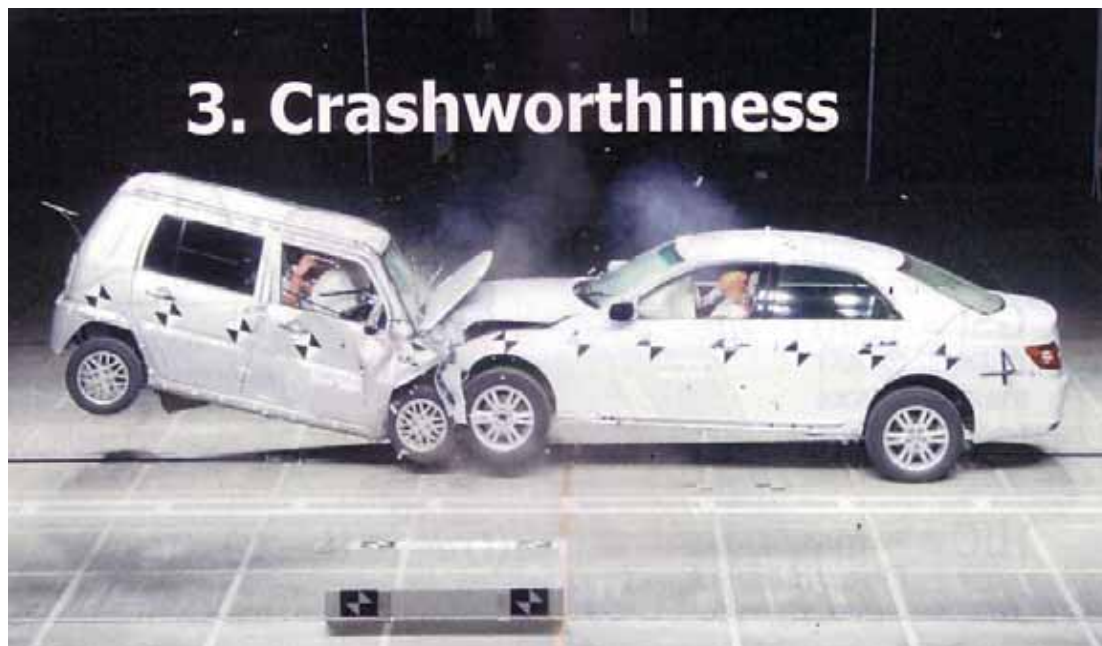
- { Case 1 → **Model 1**
- { Case 2 → **Model 2**



6 . Crash Safety

Lecturer : Honda Motor Corp. & Dokkyo Medical U.
& Nagoya U.

1. Basic Theory of Crash Safety
2. Traffic Injuries and Impact Biomechanics
3. Research and Development of Crash Safety



7 . Automotive Embedded Computing Systems

Lecturer : Toyota Motor Corp. & Doshisha U. & Nagoya U.

1. Automotive Embedded (Computing) Systems
2. E/E systems
3. In-vehicle communication

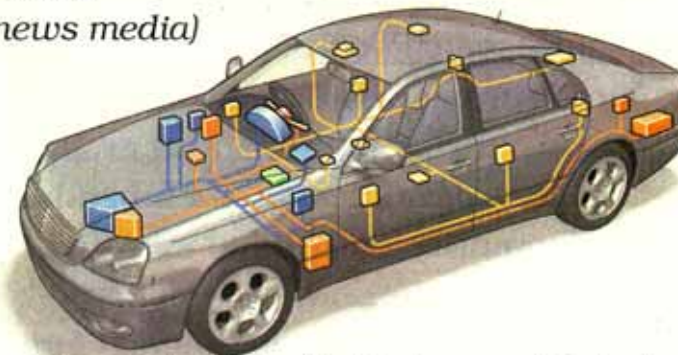
Introduction to Automotive Embedded Systems

Example: LEXUS LS460

- ▶ released in September, 2006
- ▶ more than **100 ECUs** with all optional equipment
- ▶ about **7,000,000 lines** of software embedded
(from different news media)



<http://www.lexus.jp/>

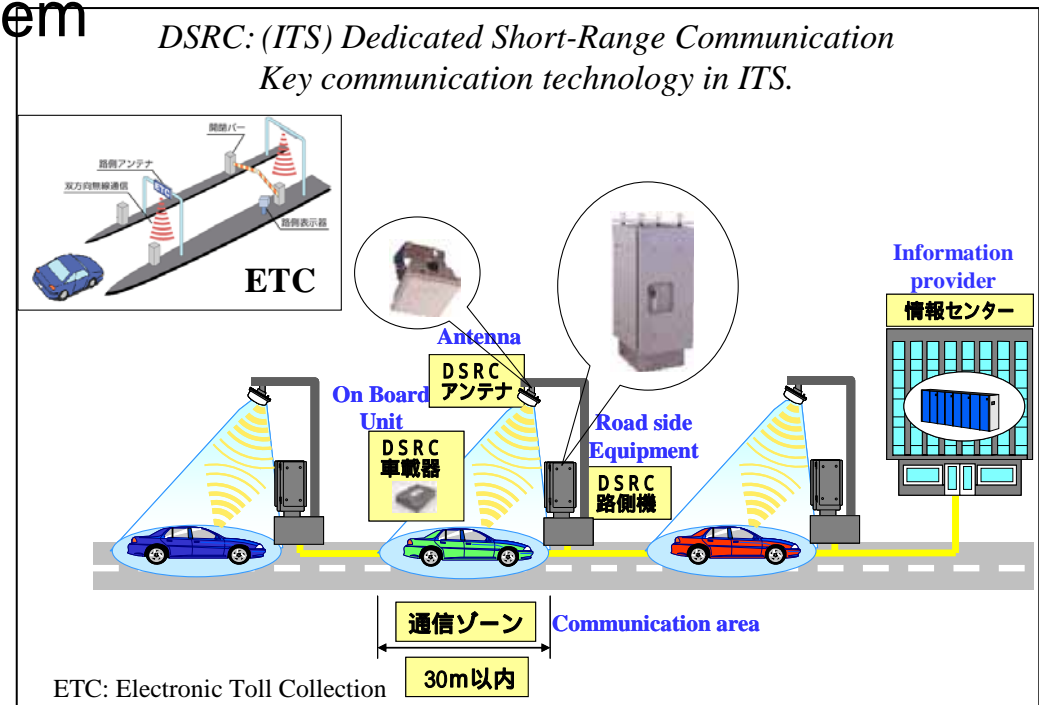


Automotive Embedded Systems and Networks

8 . Communication Technologies in ITS

Lecturer : Mitsubishi Electric Corp. & Nagoya U.

1. Communication in ITS
2. Dedicated Short-Range Communication
3. Communication Protocol
4. Assistance for Safe Driving
5. Applications of information processing
6. Traffic Information System
7. Traffic Prediction



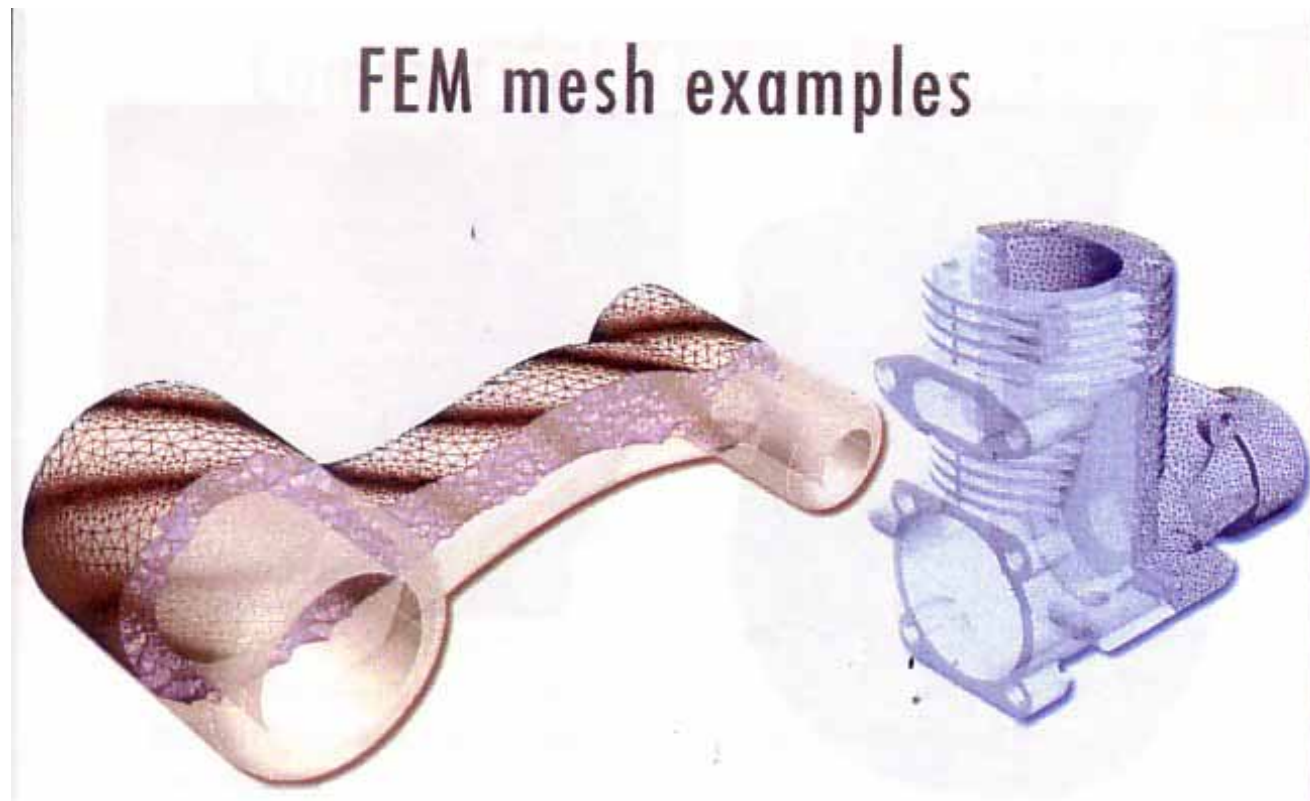
9 . CAE Activity in the Vehicle Development

Lecturer : Toyota Motor Corp. & Nagoya U.

1. Introduction to CAE

Mathematical Models/FDM /FEM /BEM

2. Current Status of CAE Activity in the Vehicle Development



10 Energy Saving Technology for Automobiles

Lecturer : Toyota Motor Corp. & Nagoya U.

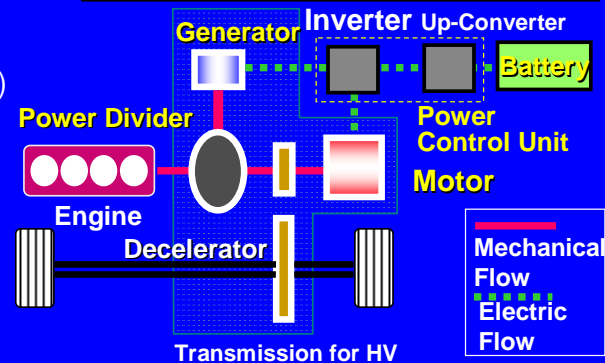
1. Evolutional Automotive Electronics
2. Vehicle Energy Management

Toyota Hybrid System (THS-)



Engine	1.5 L 4 Cylinder High-Pres.
Max.Torque	115 N·m /4200rpm
Max.Power	57kW / 5000rpm
Motor/Generator	AC-Synchronous
Battery	Ni-MH

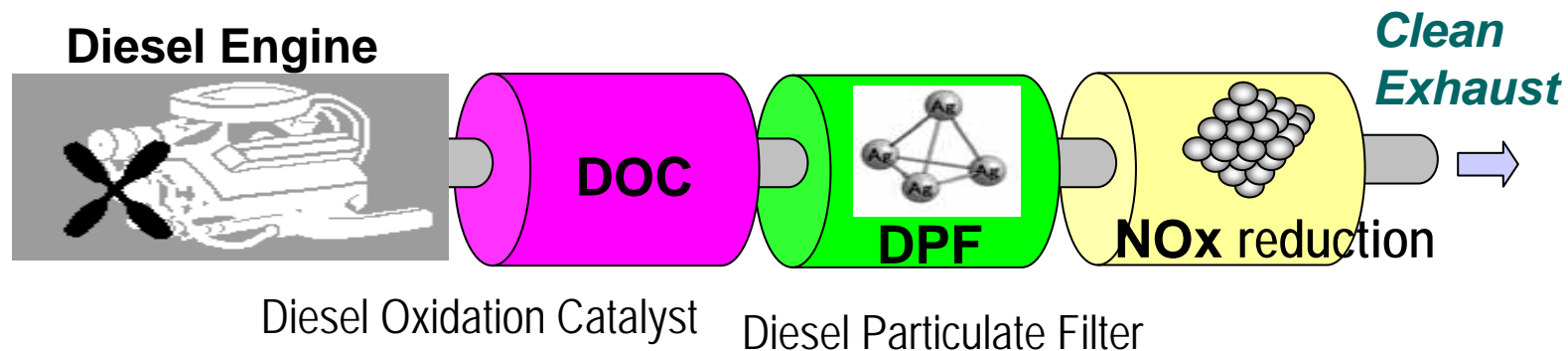
1. High Power Motor (33 kW 50 kW)
2. High Voltage Motor / Generator
3. High Voltage Generator (6,500 rpm 10,000 rpm)
4. High Power Ni-MH Battery
5. Progress of Energy Management (HV Control)



11 Fuels and Automobile Catalysts for Environmental Friendly Cars

Lecturer : Nagoya U.

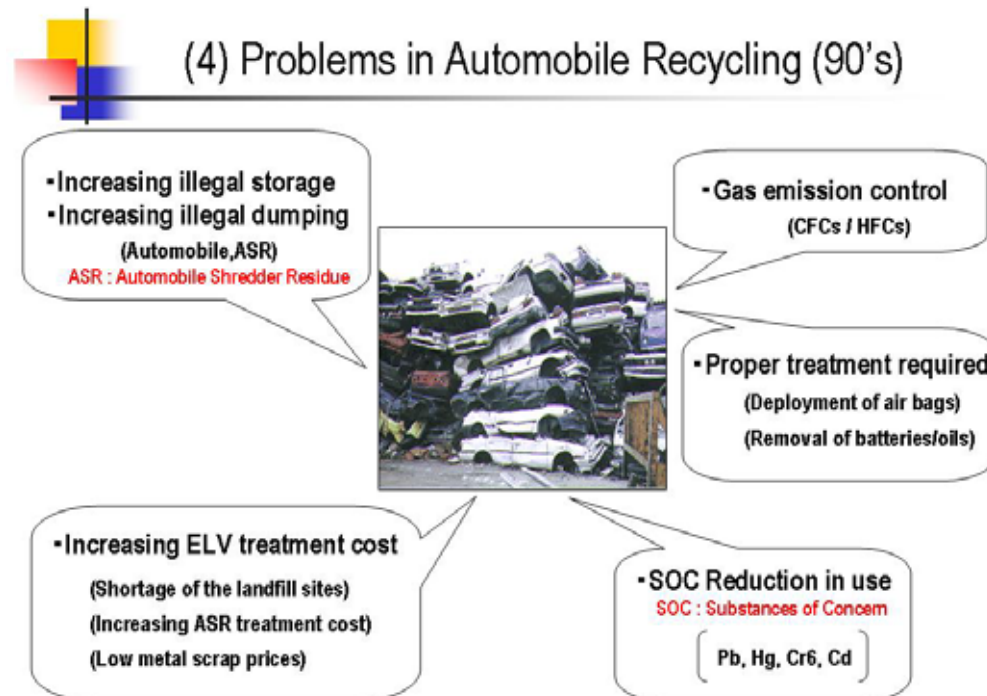
1. Automotive Catalysts for Gasoline Engines
2. Novel Catalysts for Gasoline Lean-burn and Diesel
3. Production of Fuels
4. Fuels in Future



12 Recycling

Lecturer : Toyota Motor Corp. & Nagoya U.

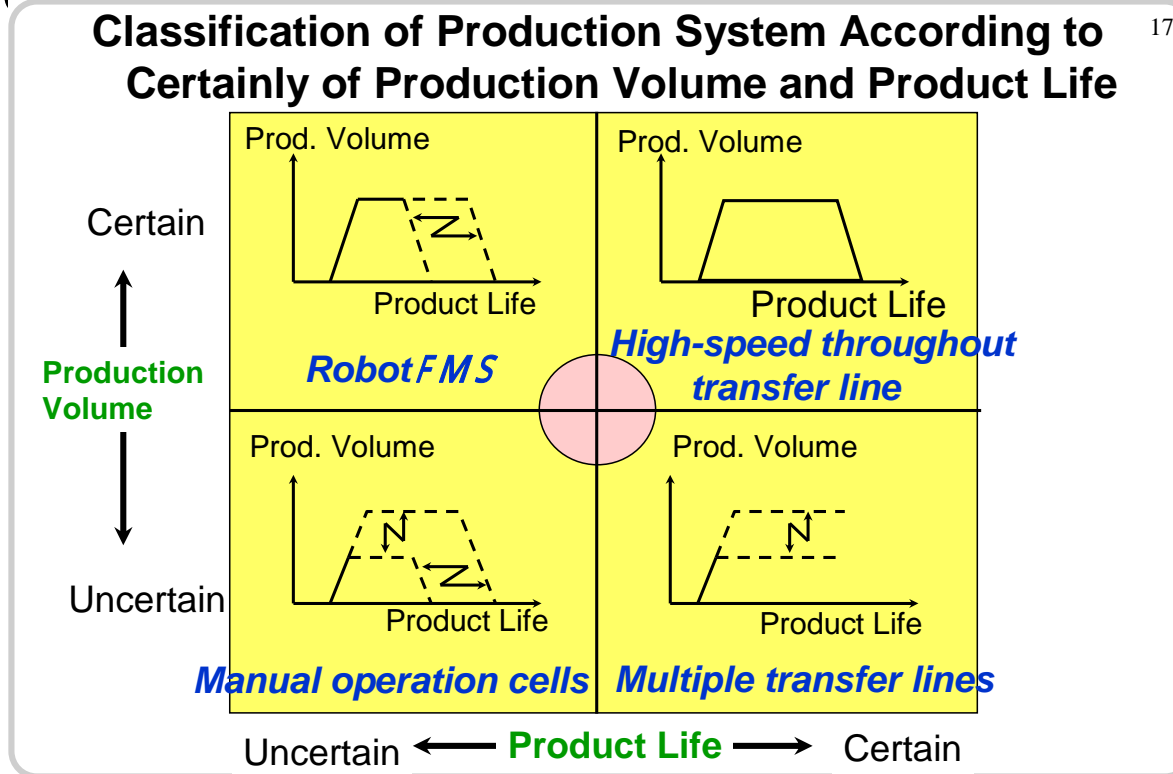
1. Automobile shredder residue (ASR)
Recycling initiatives at Toyota
2. Automobile recycling legislation in the World
3. Recycling as secondary resources



13 Car Production System

Lecturer : Dendo Corp. & Nagoya U.

1. DENSO Profile
2. Concept of the DENSO Production System
3. Development Strategies of the DENSO Production System



14 Car Production System

Lecturer : Nagoya U.

1. Role of traffic engineering
2. Fundamentals of Traffic Flow Analysis
3. Traffic Congestion and Bottleneck Phenomena

Bottleneck and Types of Congestion interchange

■ Bottleneck

- Any location which a reduction in capacity (e.g., lane drop or red light of traffic signal) causes demand to equal or exceed capacity

*without bottleneck



*with bottleneck



■ Types of congestion

- **Recurrent congestion:** occurs repeatedly at the same place (upstream of a fixed bottleneck)
- **Nonrecurrent congestion:** the result of some incident (accident, disabled vehicle, dropped obstacles, etc.)

Group Project

Participants do assignments on some specific topics in a group and make presentations



Lecture on Japanese

1. Elementary Japanese
2. Intermediate and Advanced Japanese

サマーコースはたのしかったです。車のクラスはもっと良かったです。

やさしいひとひとをあののが好きでした。

ありがとうございます。

チャーリー



Factory Visits

Six factories among the following

- 1 . National Traffic Safety and Environment Laboratory
- 2 . Toyota Motors Co.
- 3 . Toyota Higashi-fuji Technical Center
- 4 . Mitsubishi Motors Co.
- 5 . Yamaha Motor Co.
- 6 . Honda Automotive R&D Co.
- 7 . Denso Co.
- 8 . Suzuki Plaza
9. Koito

National Traffic Safety and Environment Laboratory

Neutral testing and research institute supporting the national administration of land, infrastructure and transport .



Toyota Motors Corp.

1. Higashi-Fuji Technical Center

New technology research for vehicles and engines

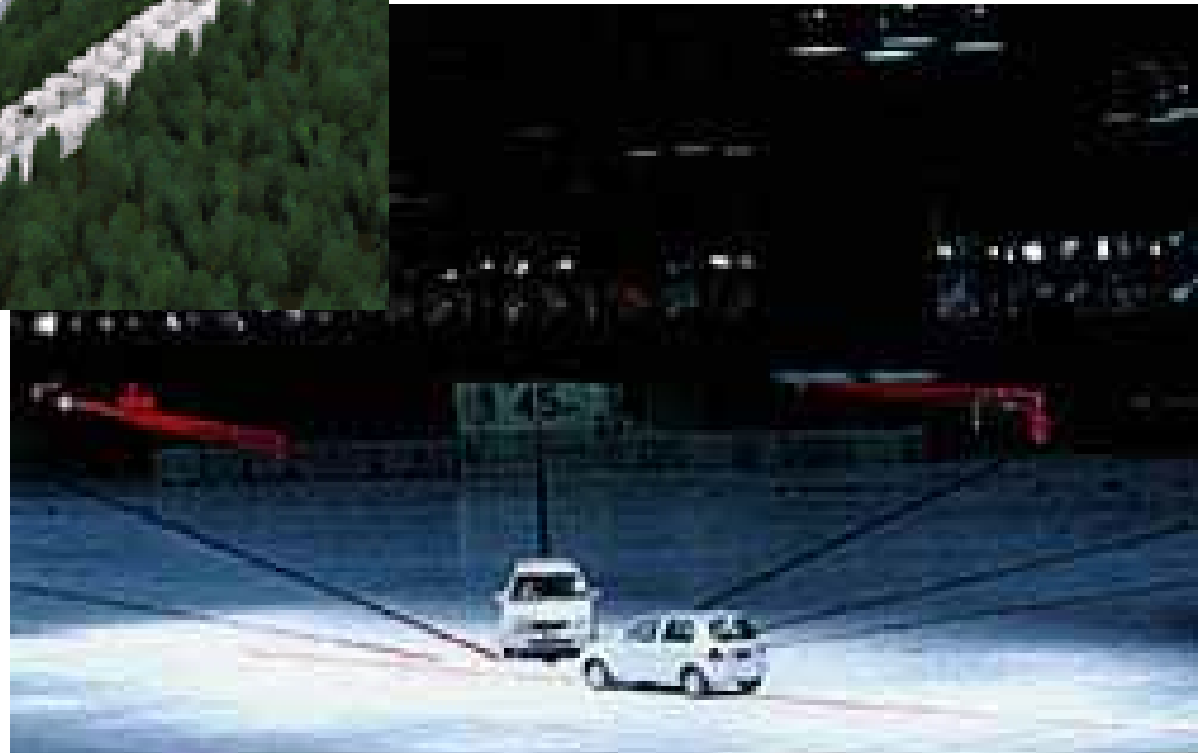
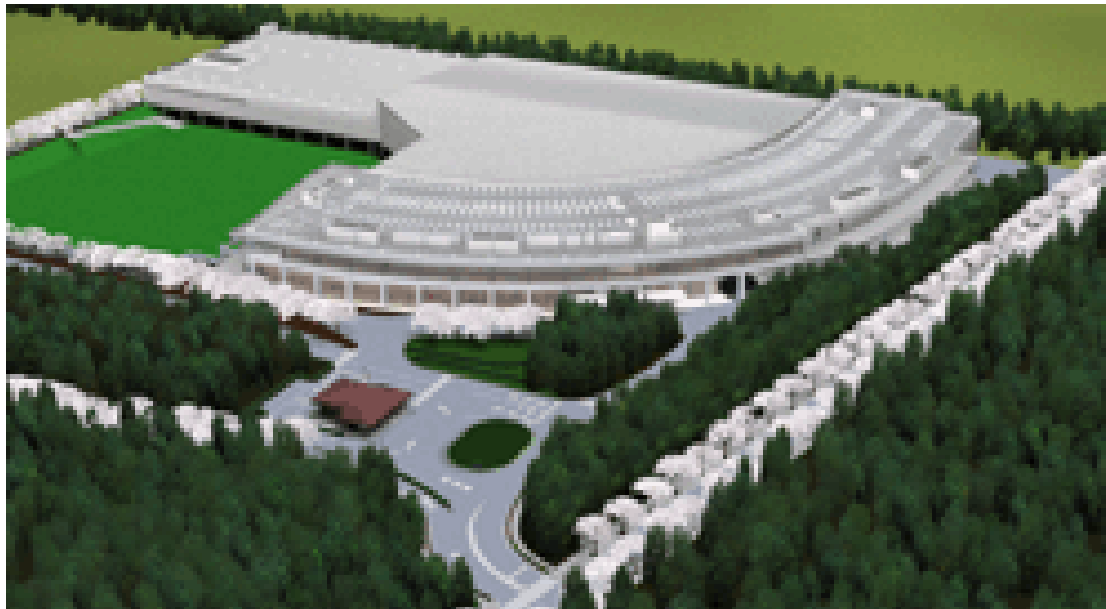
Visit the largest drive simulator in the world

2. Factory at Toyota city



Honda Automotive R&D Co.,Ltd

Visit Indoor Omni-directional Car-to-Car Crash Test Facility



Special lecture

2009 Invited lecturer from GM

1. The Changing Landscape of the US Automotive Industry: Post WWII
2. Program Management in the United States: Business and Technical Perspectives

2010 Invited lecturer from Airbus Japan

Globalization, Competition, and Japan

Special Event 2010

Meeting with Dr. Shoichiro Toyoda (Honorary Chairman of Toyota Motor Co.)



Cultural Tours

Kyoto
Kinkakuji



Kyoto
Kiyomizutera



Aichi
Meijimura



Home Stay



Overseas students had an excellent and unforgettable experience with Japanese homestay program.



*You are mostly welcome for
'NUSIP 2011' !!*

