Drive Recorder Database for Accident/Incident Study and Its Potential for Active Safety Development

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In cooperation with Society of Automotive Engineers of Japan, Inc.
Recording device: Image-captured drive recorder

- **Recording device**: Image-captured drive recorder
- **Drive recorder unit**
  - Front view camera (and in-room camera)
  - Longitudinal/Lateral acceleration
  - Vehicle speed, Brake pedal signal, Turn indicator signal
  - GPS
  - Triggering level or Manual switch
- **Storage Media Device**
- **HORIBA ITECH DR3031 (1-camera)**
- **HORIBA ITECH DR6200 (2-camera)**
- **HORIBA ITECH DR9100 (2-camera)**

- **Cameras and recording device** are integrated in 1 unit.
- **Cameras and recording device** are separated.

- **Camera images**
  - Vehicle Speed
  - Brake pedal signal
  - Turn Indicator signal
  - GPS (Map show)
  - Manual SW for rec.
  - Audio
Field Area for Data Collection

- Hokkaido pref. Sapporo city
  15 vehicles (2-camera)

- Shizuoka city
  20 vehicles (1-camera)
  2 vehicles (2-camera)

- Akita pref., Yurihonjo city
  23 vehicles (2-camera)

- Fukuoka pref.
  Fukuoka city
  20 vehicles (2-camera)

- Tokyo metropolitan area
  125 vehicles (1-camera)
  10 vehicles (2-camera)

Data storage

Drive Recorder Data Center in TUAT
Breakdown of incident data classified by level of criticalness

1-camera database

- Accident: 320
- Medium-level: 12,000
- High-level: 3,200
- Total: 50,500

2-camera database

- Accident: 100
- Medium-level: 6,500
- High-level: 1,400
- Total: 23,000

In-depth analysis can be done by using large amount of 1-camera near-miss incident data.

The cause factors of accidents can be observed from in-room camera images.

2-camera data collection and analysis will be extensively conducted.
Relevant Partners in Accident/Incident Data Analysis

- How could we share driver data including video on a global level?

① Accident/Incident Study:
   Tokyo Univ. of Agri. & Tech., U. of Tokyo, Ibaraki Univ., Akita Pref.Univ.,
   NTSEL, Jiken Center

② Active Safety Device Development and Assessment:
   11 Automotive Manufacturers, and 7 Automotive Suppliers.

③ Road Infrastructure Improvement:
   MLIT, CTIE, Metropolitan Expressway, etc.

④ Safety Education:
   National Police Agency, JSAE, etc.
Data Sharing Activities in Japan

What are the requirements on the organisations storing/analyzing the driver data?

① 「2-Camera Drive Recorder Research Group」
◆ Promoting traffic safety research by making use of 2-camera drive recorder data
◆ Fulfillment of 2-camera drive recorder database content
◆ Sharing Information relevant to drive recorder and road-accident study
◆ July 2012 started. (2 universities and 7 automotive-related companies)
◆ Research group members pay for data maintenance and new data update.

② 「Drive Recorder Utilization Research Group」
◆ Current status of drive recorders and recent activities in data analysis, including information sharing about the perspectives of the vehicle safety technology and investigations on new approaches of active safety.
◆ Started in May 2011.
(5 universities, 9 government-related research institutes, 9 automotive-related companies, 2 insurance companies, 4 user groups)
Examples of information sharing by each research group

• How could different stakeholders contribute to facilitate driver data sharing?

1. **Automotive manufacturers**
   - **Honda, Nissan etc.**: Incident data classification by active safety countermeasures
   - **Toyota CRDL**: Investigation of pedestrian motion modeling
   - **Mitsubishi**: Effectiveness estimation of intersection collision prevention systems

2. **Governments and National Research Institutes**
   - **MLIT**: Traffic safety countermeasures of residential road based on scientific analysis
   - **Jiken Center**: Analysis on low-speed rear-end collision accidents
   - **NTSEL**: Vehicle-to-pedestrian incident analysis

3. **Universities**
   - **TUAT, Univ. of Tokyo**: Analysis on causal factors of rear-end collisions
   - **TUAT, Ibaraki Univ.**: Driver behavior analysis in yellow traffic signal
   - **Akita Pref. Univ.**: Active safety countermeasure effectiveness estimation
## Future Roadmap of TUAT Drive Recorder Data Center

**Goal:** 55,000 events from 1-camera DRs

**Goal:** 22,000 events from 2-camera DRs

**Goal:** 77,000 events total

<table>
<thead>
<tr>
<th>Year</th>
<th>Tokyo</th>
<th>Shizuoka</th>
<th>Akita</th>
<th>Hokkaido (Planned)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>35 vehicles with old type DR</td>
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<td></td>
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<tr>
<td>2007</td>
<td>55 vehicles with new type DR (Horiba)</td>
<td>20 vehicles with Horiba Doreneko-II</td>
<td>15 vehicles with 2-camera Horiba Doreneko-II</td>
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<td>2008</td>
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<td>50 vehicles with Horiba Doreneko-II</td>
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<tr>
<td>2009</td>
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<td></td>
<td>23 vehicles with Horiba DR-9100V</td>
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<td>2010</td>
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<td>2011</td>
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<td>2012</td>
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<table>
<thead>
<tr>
<th>Period</th>
<th>Cumulative near-miss incident registration number</th>
<th>Goal</th>
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<tbody>
<tr>
<td>2006</td>
<td>3,700</td>
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<tr>
<td>2007</td>
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<td>2008</td>
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<td>33,000</td>
<td>55,000 events</td>
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<td>2010</td>
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<tr>
<td>2011</td>
<td>46,000</td>
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<td>2012</td>
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<tr>
<td>2013</td>
<td>53,000</td>
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<tr>
<td>2014</td>
<td>55,000</td>
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</tbody>
</table>

**Cumulative near-miss incident registration number**

- **2006:** 3,700
- **2007:** 7,800
- **2008:** 18,600
- **2009:** 33,000
- **2010:** 43,500
- **2011:** 46,000
- **2012:** 50,000
- **2013:** 53,000
- **2014:** 55,000

**Goal:** 55,000 events from 1-camera DRs

**Goal:** 22,000 events from 2-camera DRs

**Goal:** 77,000 events total
Driving education DVD

- Sample of image data available on website of JSAE
- Hazard anticipation training DVD on sale
Thank you for your attention.

Contact : mobility@cc.tuat.ac.jp
http://www.tuat.ac.jp/