Driving Behaviour Evaluation Platform using Sensory Data on Smartphones

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Motivation

• Road traffic accidents -> Fatalities / Death
• Thailand ranked second in the world (2013)
• 44 fatalities per 100,000 population
• Losses accounts for 2% of GDP (250,000 MB)

**source: University of Michigan Transportation Research Institute**
Road Traffic Accidents in Thailand

Causes of road accidents in Thailand 2009-2011

- Speeding: 39%
- Drunk driving: 33%
- Tailgating and aggressive driving: 28%

Road Traffic Accidents
- Human
- Vehicle
- Road

Approximately 67% caused by bad driving behaviour

Major problem in Thailand

**source: Royal Thai Police**
Existing Solutions for Safe Driving

Advanced Driver Assistance Systems (ADAS)
- Automatic Braking System (ABS)
- Adaptive Cruise Control
- Automatic Parking
- Blind Spot Detection
- Collision Avoidance System
- Driver Drowsiness Detection

Driver Behaviour Evaluation Tool
- In-vehicle Data Recorder
  - Speed limit violation
  - Zone violation
- Found in fleet vehicles
Can you find these in Thailand?

Advanced Driver Assistance Systems (ADAS)
- only available in *high end vehicles*
- one or two features in low to mid range vehicles

In-vehicle data recorder / driver monitoring
- only in fleet vehicles
- some taxis, buses and vans

Is there an alternative solution??

Not accessible by all drivers!
Smartphones!

- Portable
- Easily accessible
- Customisable

- Low set up cost: starting at 3000THB
- Contains many sensors
  - GPS
  - Accelerometer
  - Compass
  - Gyroscope
  - 3G / WiFi / Bluetooth / NFC
Driving Behaviour Evaluation Platform using Smartphone
• Started in 2012
• based on GPS / accelerometer sensors
• Mobile application platform
Features

- Real-time Driver Behaviour Data Collection
  - Speed Profile
  - Sudden Braking / Acceleration
  - Sudden Lane Change
  - Sudden Turn

- Real-time alerts: sound and vibration
- Driving Score
  - Users given a score and feedback
- Facebook
  - Share your score to your wall
- Published in 4 international conference papers and journals in review
Data from accelerometer

- Sudden Turn Left
- Turn Left
- Sudden Turn Right
- Turn Right
Available for FREE

Dual – Language : ENG/TH

Can be used world-wide
Potential Use Cases

1. Logistics / Fleet (Customised Solution)
   • Currency, Gold, Jewellery, Oil and Gas

2. Transportation (Customised Solution)
   • Group tour
   • School bus

3. Mobile Application (end user)
   • Ordinary drivers
   • Public transport users
• Launched during Songkran 2014
• Number of apps download 17 June 2014 = 30,000 downloads

Score of each trip

SafeMate Users: 30,947
Number of Trips: 4,668
Number of GPS data points: 8,122,970
Number of sudden events: 74,250
World Wide Usage
Conclusions

- Reduce risk of road traffic accidents
- Human factor → Drivers behaviour
- Use smartphone: tools not easy to access
- SafeMate offers alternative platform
  - Low cost / easily accessible

“Let SafeMate be your travel companion to create safer roads for yourself and loved ones”
THANK YOU