

Project Title: Smart Driver Monitoring and Feedback using Smartphone

Proposed by: Prof. Kwei-Jay Lin (klin@uci.edu)

The project is to design an intelligent agent intended for improving automobile drivers' performance by applying persuasive technology. Using the sensing capabilities of today's smartphones, the project is to build the software for car motion detection, detect driving events, analyze event patterns for driving behavior classification, and finally produce driver feedback to improve driving performance. While many current driver management systems look into driving behavior as a single event (e.g., lane-changing), a driving behavior may be judged based on the historical data. The project is to build an effective driver persuasive system. The first component is the personality classification, which recognizes drivers' personalities by analyzing driving behavior patterns. The second component is the feedback generation, which determines the current driving behavior's risk based on immediate behaviors. Once the system has identified the drivers' personalities and risk of driving behavior, it should apply means of persuasive technology, friendly-feedback, and suggestion services to help drivers improve their behaviors.

Learning Objectives:

1. Study and analysis:
 - a. Motion sensing on smartphones
 - b. Driving events and patterns
 - c. Driver historical behavior
2. Machine learning:
 - a. Data and event analysis algorithms
 - b. Machine learning on individual driving models
3. Implementation:
 - a. Selection of motion sensing algorithms for event detection
 - b. Data modeling and classification algorithms for driving pattern
 - c. Generation and implementation of user feedback

Technology and Tools:

- Python, C/C++
- Android
- GUI implementation

Project Illustration:

