

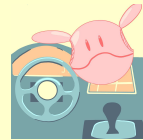


AutoCoach2.0

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PROJECT GOALS:

Train novice drivers automatically

- supervising the performance of drivers
- providing timely responses and warnings upon detection of dangerous operations
- offering evaluation reports on performance



RESULT: Dangerous Operations Detecting

1. Driving without looking to the front 3+s
(Camera != Front) * ($\Delta t \geq 3s$)
2. Looking away frequently while driving fast
(Speed > 40mph) && (3 * (Camera != Front)) * ($\Delta t \leq 10s$)
3. Turning without slowing down
(Speed > 20mph) && (Acceleration > 0) && (Gyro > 45)
4. U-turn without slowing down
(Speed > 10mph) && (Acceleration > 0) && (Gyro > 90)
5. Turning/Switching Lane without checking sides
(Gyro > 45) && (Camera == Front)



IMPACTS

- Feedback provided on detection of above dangerous operations as displayed in the screenshot on the right
- Trip quality evaluation made based on the occurrence of dangerous operations

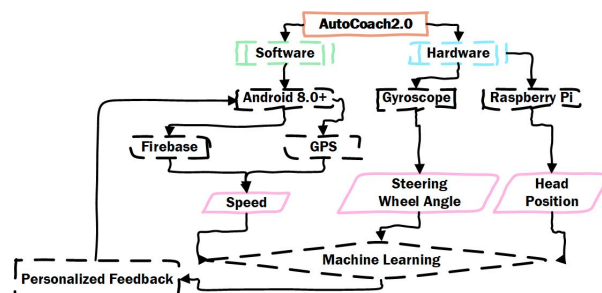
IMPROVEMENTS

- Simultaneous model tuning for performance improvement
- Integrating personality test to analyze driving performance
- Detect personalized abnormal behavior

BACKGROUND

- mathematical models for evaluation purpose
→ deep learning models: flexibility, customization
- single factor warning devices
→ multiple dimensional responses
→ more variables to be considered cooperatively

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Devices and Implementations

Android Device (Android 8+): Speed Detection, Database, Response

Raspberry Pi: Camera Head Motion Detection

Gyroscope: Steering Wheel Angle Detection

