Flare Inc.

Demonstration project of AI-powered unsafe driving visualization solution to reduce traffic accidents and enhance safety in Thailand

Objective of the project

The objective of this project is to develop and demonstrate an AI solution to visualize unsafe driving, aiming to reduce traffic accidents and improve safety in Thailand. The system for this project detects unsafe driving behaviors—such as accelerating or braking suddenly, and speeding—by utilizing data obtained from smartphone sensors via a dedicated mobile application. Against the backdrop of traffic accidents being a major social issue, we introduced and demonstrated this AI-based solution to decrease the number of traffic accidents and enhance safety in the country.

Cooperation with local companies/governments

Our counterparts were Toyotsu L&C (Thailand) Co., Ltd. and Flare (Thailand) Co., Ltd. We collaborated on the provision, proposal, and needs assessment for a mobile application that facilitates the digital transformation (DX) of attendance and operational management, which has also been equipped with an AI-powered dangerous-driving analysis function.

Toyotsu L&C (Thailand) Co., Ltd.

Flare (Thailand)Co.,Ltd.

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Targeted economic/social issues

According to a World Health Organization (WHO) report, Thailand has one of the highest traffic accident fatality rates in the world, and traffic accidents have become a significant social problem. The accident rates are high for both two-wheel and four-wheel vehicles, and there is an urgent need to improve driving behaviors. This project specifically focuses on unsafe driving behavior, a primary cause of traffic accidents. By detecting and analyzing these behaviors, it becomes possible to formulate concrete measures for accident prevention. In urban areas, including Bangkok, chronic traffic congestion is a serious problem and is also causing frequent accidents. Furthermore, delays in introducing advanced technology for accident prevention have contributed to the delay in establishing safety measures. In Western countries and Japan, advanced accident prevention systems, such as AI-based driver monitoring systems and systems using in-vehicle cameras and sensors, are rapidly gaining popularity. However, in Southeast Asia, particularly in Thailand, the diversity of vehicles in circulation and issues with technological compatibility with existing infrastructure have been pointed out as barriers to adopting such technologies. In consideration of these circumstances, this project adopted the use of smartphones, which are readily available in Thailand, as an approach suitable for the actual situation in the country.

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Demonstration period

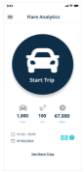
December 2023 – November 2024

Details of demonstration

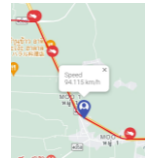
We provided Flare Dash/Analytics, a business management mobile application equipped with an AI-powered unsafe driving analysis function, with the cooperation of local Thai companies. This unsafe driving detection app can be used only with a smartphone, eliminating the need for installing in-vehicle equipment, making it low-cost and easy to introduce even in emerging countries. Driving data recorded via the app is used to visualize and evaluate unsafe driving behaviors with a high probability of leading to accidents on a map of a management dashboard. This presents objective points for improvement, raising awareness of safe driving. We attempted to improve the accuracy of the unsafe driving analysis by utilizing data obtained through repeated sample driving data collection in Thailand. Data was primarily collected from two-wheel and four-wheel vehicles in major cities such as Bangkok and their neighboring cities in Thailand. This data was used to evaluate driving behaviors both in urban areas with heavy traffic congestion and in rural areas with low traffic volume, and to improve the accuracy of the unsafe driving detection algorithm. The system was also tested to see how it functions during the Thai rainy season with slippery road conditions and in long traffic jams in order to verify the algorithm's adaptability to actual local situations.

Project outcome/ future plans

The unsafe driving detection algorithm, which is the core of this system, achieved a significant improvement in accuracy through demonstration tests in Thailand. The initial detection accuracy was approximately 70%, but it was improved to approximately 90% by incorporating appropriate parameters into the algorithm based on a detailed analysis of Thailand's unique traffic conditions, communication environment, and driving habits. This improvement was realized by collecting local driving data and applying it to a machine learning model. The success of algorithm customization in Thailand indicates a high degree of adaptability to other markets. Specifically, this has increased the potential for rapid system deployment in other ASEAN countries with traffic environments similar to Thailand, such as Vietnam and Indonesia, by applying the development know-how from this project. This implies that the system has the ability to flexibly adjust its algorithms to suit the specific traffic conditions of each country, which will be a major advantage in future international expansion. We are also planning to collaborate with local Thai government bodies, research institutions, and the police to incorporate knowledge necessary for algorithm refinement. In particular, by incorporating opinions from experts into traffic engineering and psychology, we aim to build a more practical and effective system.



Mobile-Only Unsafe Driving Management



Visualize Unsafe Driving Locations on a Map

Display Unsafe Driving Trends by Event