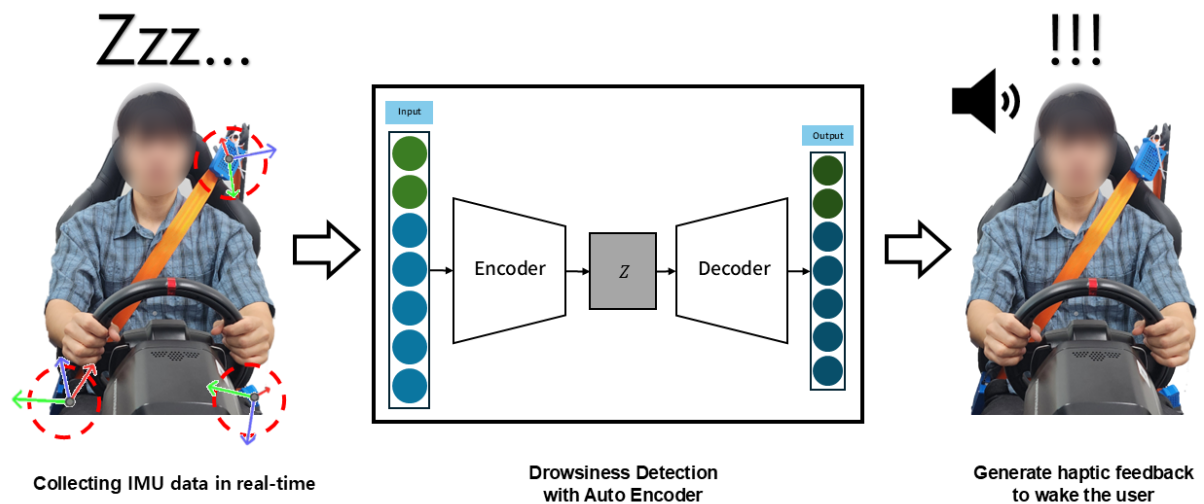


## DRIVE: Drowsiness Recognition and Intelligent Vibration Evocation



**Summary:** While camera-based driver drowsiness detection systems enhance passenger safety, their implementation in commercial vehicles is hindered by significant privacy concerns. Our proposal is to provide a novel, cost-effective, and privacy-preserving alternative. We have integrated Inertial Measurement Unit sensors into a standard three-point seatbelt to continuously monitor the driver's movements. A trained transformer model analyzes the sensor data in real-time to accurately detect drowsiness-related motion patterns. This approach effectively identifies driver's fatigue without intrusive visual recording, offering a practical and affordable solution for widespread adoption in the automotive industry, thereby improving road safety while respecting driver privacy.