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i-DREAMS - Safety tolerance zone calculation and intervetions for driver-vehicle-environment interactions underchallening conditions

Scientific Responsible
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The objective of this project is to setup a framework for the definition, development, testing and validation of a context-aware 'safety tolerance zone' for on-road driving, within a smart Driver and Road Environment Assessment and Monitoring System (i-DREAMS). Taking into account, on the one hand, driver-related background factors (age, driving experience, safety attitudes and perceptions, etc.) and real-time risk-related physiological indicators (e.g. fatigue, distraction, stress, etc.), and on the other hand, driving task-related complexity indicators (e.g. time of day, speed, traffic intensity, presence of vulnerable road users, adverse weather, etc.) a continuous real-time assessment will be made to monitor and determine if a driver is within acceptable boundaries of safe operation (i.e. safety tolerance zone). Moreover, safety-oriented interventions will be developed to prevent drivers from getting too close to the boundaries of unsafe operation and to bring back the driver into the safety tolerance zone. These interventions will be composed of both real-time interventions, i.e. in-vehicle while travelling, and other interventions aimed at enhancing the knowledge, attitudes, perceptions and behavioural reaction of drivers with respect to safety-related technologies, situations and behaviours. Application areas will include: new road safety interventions, improved driver well-being and transfer of control between human and vehicle. Initial testing will take place in a driving simulator environment after which promising interventions will be tested and validated under real-world conditions in a testbed consisting of 600 drivers in total across 5 EU countries. Market roadmaps will be developed to support smooth transition of the investigated technologies to the market and experience from use cases in different European countries will be used to disseminate best practices.