

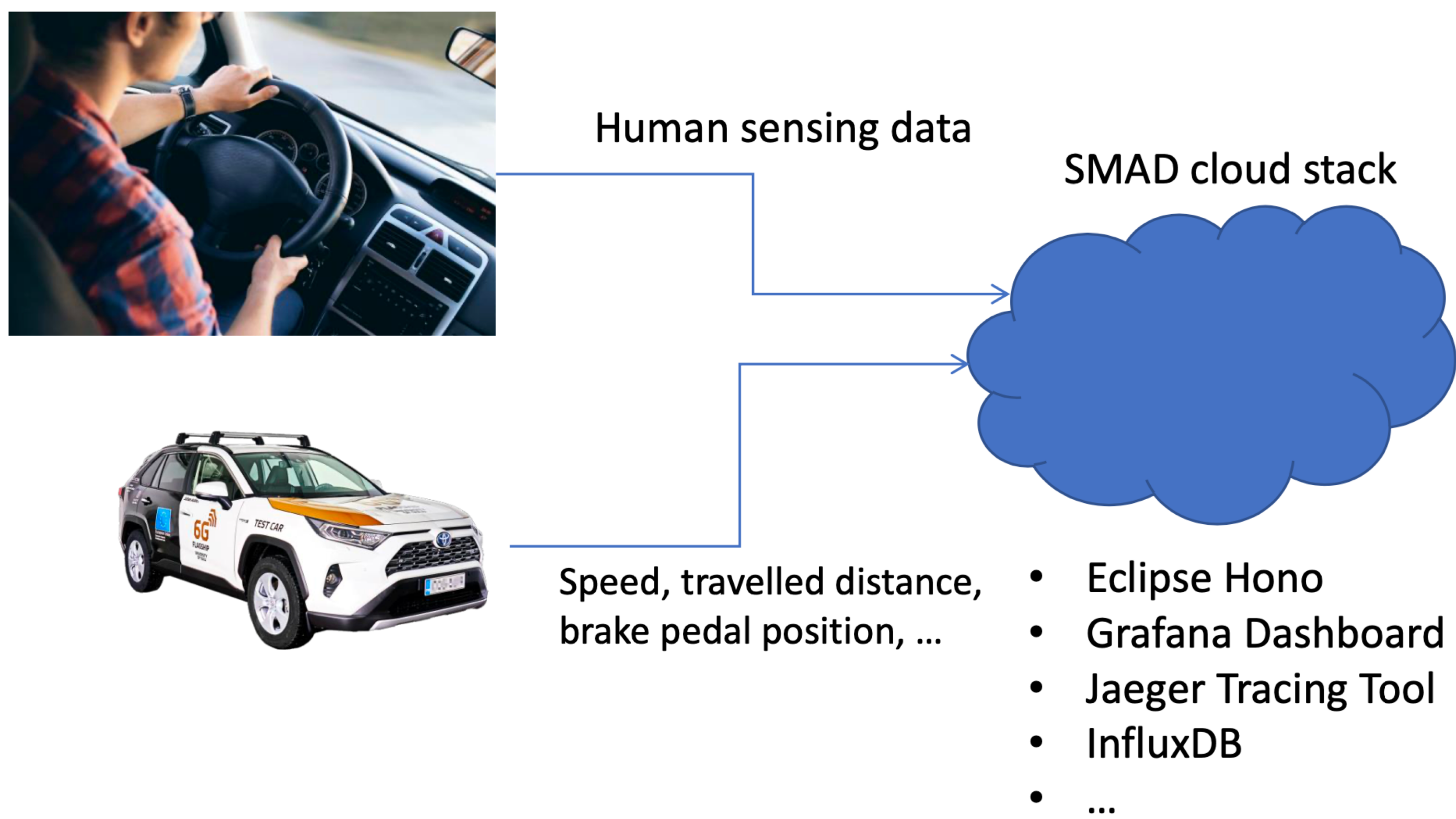
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Skadi: Heterogeneous Human-sensing System for Automotive IoT

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Over the past years, cars' computing, sensing, and networking capabilities have rapidly increased, and the automotive development aims for autonomous driving. However, the driver is still the focal point for decision making. It has to be alert at all times to avoid traffic accidents due to human factors such as tiredness, inattentiveness, and intoxication. Therefore, there is a need for a system that monitors the driver and intervenes before human failure can have a negative impact on traffic.

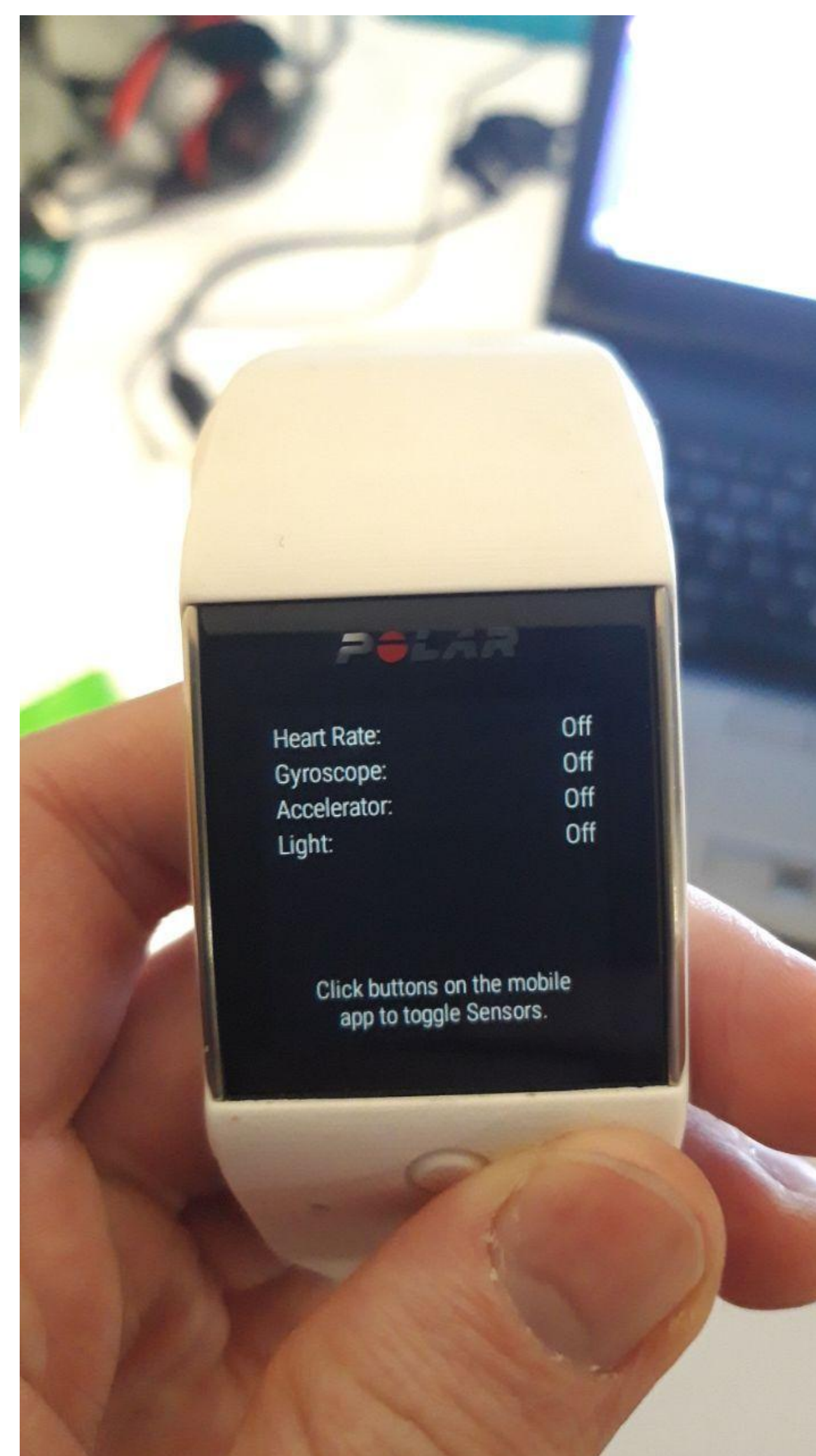
A variety of commercially available wearable IoT devices, such as smartwatches, bracelets, and rings, are capable of monitoring human health conditions. However, those devices come with technological differences and manufacturer-specific implementations.



In this work:

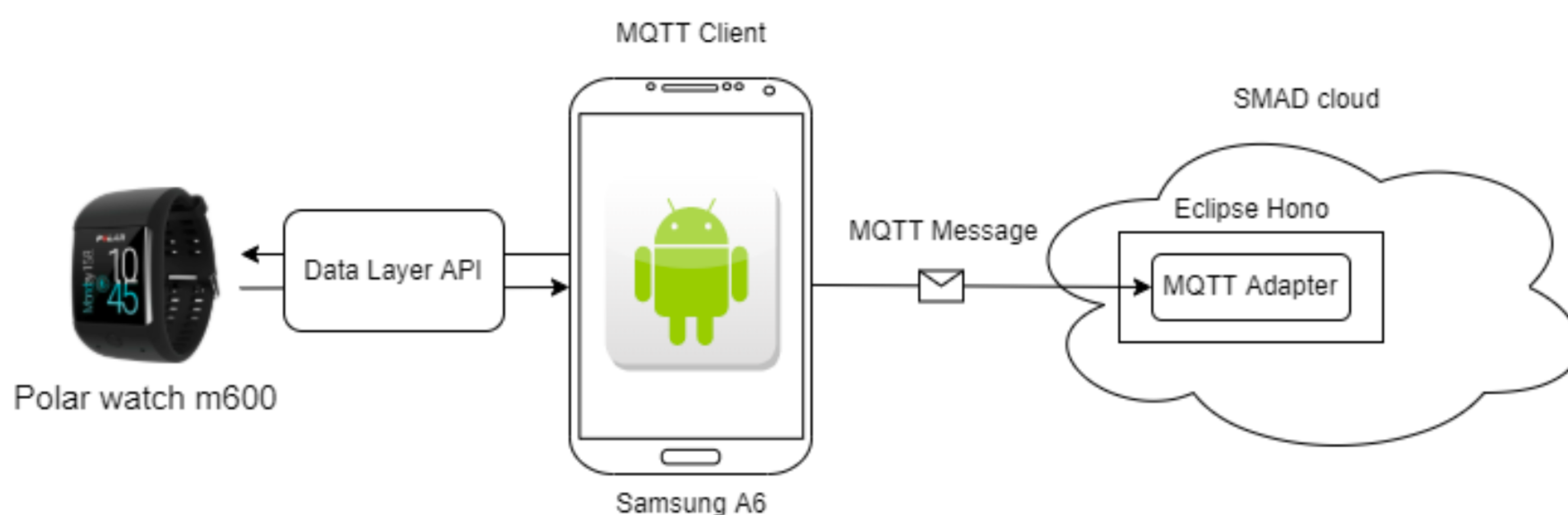
- ❑ We propose a prototype for a human-sensing and health monitoring system based on wearable sensor devices.
- ❑ We aim for a solution that ignores the technological heterogeneity of IoT devices and generalises their implementation into the automotive system.
- ❑ Consequently, the data should be available to be analysed together with the data collected from the vehicular sensors.

Our solution is compatible with open-source platforms Eclipse Hono and Kuksa.



Future work:

- ❑ Extension of multiple sensors and devices.
- ❑ Solving energy consumption issues related to using smartphones as gateways for wearable devices.
- ❑ Data collection studies with the full setup of sensors and automotive data.
- ❑ Analytics, including possible use cases such as tiredness, stress, and inattentiveness during driving.



System architecture of the Skadi prototype using the Polar smartwatch, Samsung smartphone, and Eclipse Hono cloud service called SMAD, that also collects the vehicular data through Eclipse Kuksa service.



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