Privacy and safety improvement of VANET data via a safety-related privacy scheme

- [Ruqayah Al-ani](),
- [Thar Baker](),
- [Bo Zhou]() &
- [Qi Shi]()

Abstract

Vehicular Ad-hoc NETwork (VANET) safety applications allow vehicles to exchange messages with surrounding vehicles periodically to improve the contextual awareness of the drivers about the driving environment which significantly enhances traffic safety. However, these messages usually contain sensitive information such as the Spatio-temporal information of each vehicle which might be exploited by malicious entities for various purposes (e.g. monitoring the vehicle for a long period and breaching the driver's privacy). Researchers have proposed different schemes to enhance the privacy level of drivers and their vehicles alike. However, most of the existing schemes have a negative impact on safety applications; they stop broadcasting messages for a period which increases the chance of accidents. In this paper, we propose a Safety-related Privacy Scheme (SRPS) that enhances both the privacy and safety of VANET safety applications by reducing silent periods without degrading the privacy level. While the vehicle continues monitoring neighbour vehicles if an accident is expected, it exits the silent period and starts sharing its location with its neighbour vehicles. The SRPS consists of two algorithms based on the status of the vehicle (i.e. *silent* vs. *active*). These algorithms use a multi-target tracking algorithm to search for an effective context to change pseudonyms and avoid potential accidents. Four simulators are used to implement SRPS. The latter has been compared with five pseudonym-changing schemes (PPC, RSP, CSP, SLOW, and CAPS). The simulation results indicate that SRPS achieves an efficient balance between security, privacy, and safety when compared to the other schemes.