From Access to Sharing: A policy-based framework for Vehicle Data Handling

Doktorandenkolloquium am Mittwoch, 16.7.2025
im Raum VR 147b, JUR, Innstr. 39, Universität Passau, 94032 Passau
um 16:05 Uhr
und online per Zoom (die Zoomdaten wurden intern gemailt)
von Herrn Ashish Ashutosh

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Abstract: As vehicles become increasingly connected, they generate and share vast amounts of sensor data with external services such as cloud platforms, insurers, and infrastructure providers. However, the continuous exchange of sensor and behavioural data raises critical concerns around user privacy, data security, and regulatory compliance. Addressing these challenges requires not only secure data sharing but also fine-grained, user-controlled access enforcement.

To this end, this thesis introduces XACML4M, an extended access control framework tailored to the dynamic nature of connected vehicles. Building on the Attribute-Based Access Control (ABAC) model, XACML4M supports policies based on time, location, and frequency - enabling flexible and context-aware control over vehicle data access. A proof-of-concept implementation demonstrates its functional feasibility in real-world settings.

While XACML4M enforces access decisions within the vehicle, it cannot preserve these constraints once data is shared externally. To bridge this gap, the thesis proposes Sticky-PRE, a protocol that combines sticky policies with proxy re-encryption to ensure that user-defined restrictions persist across organizational boundaries.

Finally, the thesis outlines an ongoing exploration into the privacy-utility trade-off in machine learning, investigating how anonymization affects both predictive performance and data protection in insurance-related use cases.