MERT D. PESÉ

University of Michigan, Ann Arbor | Ph.D. Candidate

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EDUCATION

University of Michigan, Ann Arbor — Ann Arbor, MI
Ph.D in Computer Science & Engineering advised by Prof. Kang Shin — Jan. 2017–Apr. 2022 (expected)

Technical University Munich — Munich, Germany
M.S. in Electrical Engineering and Information Technology (*Highest Distinctions)* — Dec. 2016

Technical University Munich — Munich, Germany
B.S. in Computer Science — Jul. 2015

Technical University Munich — Munich, Germany
B.S. in Electrical Engineering and Information Technology (*Highest Distinctions)* — Jul. 2014

WORK EXPERIENCE

University of Michigan — Ann Arbor, MI
Graduate Research Assistant, Real-Time Computing Laboratory — Jan. 2017–Present

CISPA Helmholtz Center for Information Security — Saarbrücken, Germany
Visiting Researcher, Secure Cyber-Physical Systems Group & Trusted Systems Group — Jun. 2021–Aug. 2021

General Motors — Warren, MI
Cybersecurity Research Intern, Electrical & Controls Systems Architecture Team — Jun. 2020–Aug. 2020

Harman International — Novi, MI
Product Cybersecurity Intern, Automotive Product Security — May 2019–Aug. 2019

General Motors — Warren, MI
Cybersecurity Research Intern, Electrical & Controls Systems Architecture Team — Jun. 2018–Aug. 2018

Audi — Ingolstadt, Germany
Researcher, Audi Electronics Venture — Apr. 2016–Oct. 2016

Audi — Ingolstadt, Germany
Cybersecurity Intern, Audi Electronics Venture — Jan. 2016–Mar. 2016

University of Michigan Transportation Research Institute — Ann Arbor, MI
Automotive Security Intern, Automotive Cybersecurity & Privacy Group — Sep. 2015–Dec. 2015

Bertrandt — Ingolstadt, Germany
Automotive Ethernet Intern, In-Vehicle Networks and Gateway Team — Mar. 2015–Aug. 2015

BFFT Ingolstadt, Germany
Embedded Software Design Intern, Vehicle Interface Development Team Aug. 2013–Oct. 2013

Panasonic Pfaffenhofen, Germany
Electrical Engineering Intern, Relays Testing Laboratory Aug. 2012–Sep. 2012

PUBLICATIONS

1. **Mert D. Pesé**, Jay W. Schauer, Junhui Li and Kang G. Shin. "S2-CAN: Sufficiently Secure Controller Area Network," *Annual Computer Security Applications Conference 2021 (ACSAC'21)*, Dec. 2021.
2. **Mert D. Pesé**, Xiaoying Pu, and Kang G. Shin. "SPy: Car Steering Reveals Your Trip Route!," *Proceedings on Privacy Enhancing Technologies 2020 (PETS'20)*, July 2020.
3. **Mert D. Pesé**, Kang G. Shin, Josiah Bruner, and Amy Chu, "Security Analysis of Android Automotive," *SAE Technical Paper 2020-01-1295 (WCX'20)*, Apr. 2020.
4. **Mert D. Pesé**, Troy Stacer, C. Andrés Campos, Eric Newberry, Dongyao Chen, and Kang G. Shin. "LibreCAN: Automated CAN Message Translator," *2019 ACM SIGSAC Conference on Computer and Communications Security (CCS '19)*, Nov. 2019.
5. **Mert D. Pesé** and Kang G. Shin, "Survey of Automotive Privacy Regulations and Privacy-Related Attacks," *SAE Technical Paper 2019-01-0479, 2019 (WCX'19),* Mar. 2019.
6. **Mert D. Pesé**, Arun Ganesan and Kang G. Shin, "CarLab: Framework for Vehicular Data Collection and Processing," *Proceedings of the Second ACM International Workshop on Smart, Autonomous, and Connected Vehicular Systems and Services (CarSys'17),* Oct. 2017.
7. Armin Wasicek, **Mert D. Pesé**, Andre Weimerskirch, Liza Burakova and Karan Singh, "Context-aware Intrusion Detection in Automotive Control Systems," *5th escar USA (escar'17),* Jun. 2017. (Acceptance rate: 13/49 = 26.5%)
8. **Mert D. Pesé**, Karsten Schmidt and Harald Zweck, "Hardware/Software Co-Design of an Automotive Embedded Firewall," *SAE Technical Paper 2017-01-1659 (WCX'17),* Mar. 2017.

PATENTS

Sufficiently Secure Controller Area Network Filed in Oct. 2021
Inventors: **Mert D. Pesé**, Kang G. Shin

Systems and Methods for Preserving Privacy of Collected Vehicular Data Granted in Sep. 2021
Inventors: **Mert D. Pesé**, Evripidis Paraskevas, Fan Bai, Massimo Osella, Soheil Samii US Patent 11,126,744

Anomaly Detection Systems and Methods Filed in Nov. 2020
Inventors: **Mert D. Pesé**, Prachi Joshi, Kemal E. Tepe

Automated CAN Message Translator Filed in Sep. 2019
Inventors: **Mert D. Pesé**, Kang G. Shin

RESEARCH PROJECTS

Spoofing and DoS Protection on CAN Bus [ongoing]
Developing a powerful defense framework for the CAN bus to prevent spoofing and Denial-of-Service (DoS) attacks.

V2V-Based Anomaly Detection System [ongoing]
Developing an anomaly detection system leveraging BSM data from V2V communication to detect inconsistencies and anomalies.

Feasible Security Solution for CAN Bus [ACSAC'21]
Developing an alternative security approach to satisfy confidentiality and integrity properties of the CAN bus while minimizing overhead.

Security Analysis of Android Automotive [WCX'20]
Conducted first high-level security analysis of novel Android Automotive platform on IVI unit. Demonstrated three proof-of-concept attacks and extended recommendations.

LibreCAN: Automated CAN Message Reverse Engineering Framework [CCS'19]
Developed a tool to automatically reverse engineer CAN traffic recorded from vehicles and generate a DBC file.

Automotive Privacy: Attacks and Defenses [WCX'19,PETS'20,ongoing]
Surveyed the field of privacy-related attacks on vehicular data, analyzed privacy regulations and existing threat models and designed an attack. Designing and implementing privacy-protection scheme for vehicular data.

Framework for Vehicular Data Collection and Processing [CarSys'17,ongoing]
Designing and implementing end-to-end open-source vehicular data collection, translation and sharing framework.

Automotive Context-Aware Intrusion Detection Using Neural Networks [escar'17]
Designed a context-aware intrusion detection (CAID) to recognize chip tuning on automotive ECUs with a very high probability using an unsupervised Artificial Neural Network (ANN).

Design and Evaluation of Firewall for Ethernet Domain Controller E/E-Architecture [WCX'17]
Designed and implemented a firewall for Ethernet domain controller architecture in HW (FPGA) and SW (ECU). Evaluated several performance metrics (e.g., latency, memory consumption) based on real traffic model.

Uptane: Securing Software Updates for Automobiles
Worked with team to develop a framework for secure automotive OTA software updates. Defined requirements towards the design and developed a comprehensive threat model.

TEACHING EXPERIENCE

University of Michigan — Ann Arbor, MI
Graduate Student Instructor, EECS 571 Principles of Real-Time Computing — Aug. 2021–Dec. 2021

Technical University Munich — Munich, Germany
Undergraduate Teaching Assistant, Four Courses in ECE Department — Apr. 2013–Jul. 2014

STUDENT MENTORING

Arman Tabaddor, Bryan Brauchler, Eric Andrechek, Cassandra Joseph — Fall 2021

Junhui Li, Arman Tabaddor, Murali Mohan, Erich Shan, Bryan Brauchler — Winter 2021

Junhui Li, Jay W. Schauer, Arman Tabaddor, Batuhan Akcay — Fall 2020

Junhui Li, Jay W. Schauer, Jiaxiang Ma — Summer 2020

Junhui Li, Jay W. Schauer — Spring 2020

Troy Stacer, C. Andrés Campos, Alice Ying — Fall 2019, Winter 2020

Troy Stacer, C. Andrés Campos, Alice Ying, Osama Saeed — Winter 2019

Troy Stacer, Alejandro Fischer, Kurt Ayalp — Fall 2018

PROFESSIONAL SERVICE

IEEE Transactions on Information Forensics & Security — 2021
Reviewer

AutoSec Workshop @ NDSS — 2021-2022
Technical Program Committee Member

Automotive Security Research Group (ASRG) — 2019-Present
Member and Speaker

SAE World Congress Experience (WCX) — 2020-Present
Session Organizer / Technical Program Committee Member

Eta Kappa Nu - Beta Epsilon Chapter — 2018-Present
Member, Mentor and DEI Committee Member

SAE CyberAuto Challenge — 2019
Industry Mentor for High School and Undergraduate Students

SAE World Congress Experience (WCX) — 2019, 2020
Reviewer

ACM/IEEE Symposium on Edge Computing (SEC) — 2018
Reviewer

ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS) — 2017, 2018
Sub-reviewer

SAE Data Link Connector Vehicle Security Committee (TEVDS20) — 2017
Member

Conference on Cryptographic Hardware and Embedded Systems (CHES) — 2017
Sub-reviewer

INVITED TALKS & PANELS

How Secure is Secure Enough? — Apr. 2021
Panel Discussion @ SAE WCX 2021

LibreCAN: Automated CAN Message Translator — Oct. 2020
Webinar @ ASRG

Introduction to Automotive Networks — Sep. 2020
Invited Lecture @ University of Michigan

Security and Privacy of Tomorrow's Connected Vehicles — Oct. 2019
WiCyS Breakfast Talk @ University of Windsor

Security and Privacy of Tomorrow's Connected Vehicles Oct. 2019, Nov. 2020
Invited Lecture @ University of Michigan

Security and Privacy of Tomorrow's Connected Vehicles Apr. 2019
CPS Seminar Series @ CU Denver

AWARDS & HONORS

Rackham Conference Travel Grant 2017, 2019, 2020
University of Michigan Rackham Graduate School

ACM MobiCom Student Travel Grant 2017
ACM SIGMOBILE

National Scholarship for 0.5% of all students 2015 - 2018
German Academic Scholarship Foundation

Travel Grant 2015
Heinrich und Lotte Mühlfenzl-Stiftung

Deutschlandstipendium 2013, 2014
Federal Ministry of Education and Research (Germany)

Fulbright Scholarship 2014
Fulbright Commission

Scholarship for Exchange Semester 2014
Lothar and Sigrid Rohde Foundation