



Senior Security Analyst

Tim Hummel

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Abstract

Freelance Security Expert consulting customers remote and on-site, evaluating their products or aiding development.

In the last decade I evaluated among others things: embedded Linux systems, mobile payment solutions, secure boot implementations, bootloaders, IoT products with and without TPMs, mobiles devices, entertainment systems, Trusted Execution Environments, TEE operation systems, car MCUs, charge poles, white box crypto solutions, and transport cards.

Most of my projects are confidential, with one notable exception. The public review of the cryptographic framework and server backend of the Dutch Covid-19 contract tracing app for the Dutch Ministry of Health and Dutch parliament: <https://tinyurl.com/covidNLROS>

To test the security of a product, I apply techniques like source code analysis, design reviews, binary reverse engineering, PCB/hardware analysis, Fault Injection, and Side Channel Analysis.

As a Freelance Security Expert, I am personally responsible for the quality of a project and execute it from start to finish. If available I coordinate the technical activities with a team. Next to the security evaluations I give trainings or coaching to customers, other security analysts or develop new tools.

Freelance Projects

Freelancer
Security Consultant/Expert

Delft, Netherlands
Jan 2019 – Today

Please find a few sample projects below, most customer names and details are omitted due to non-disclosure agreements:

Cryptographic Framework and Back-end Security Evaluation Dutch Covid-19 Contact Tracing App for the Dutch Ministry of Health

- Cryptographic review also taking privacy aspects into account
- Reporting to the Ministry of Health, developers and parliament
- Server software and infrastructure review
- Report: <https://tinyurl.com/covidNLROS>

European Federation Gateway Service for the European Commission

- Cryptographic, security and infrastructure review
- Backend infrastructure for corona key exchanges

Network penetration testing

- On-site test simulating an attacker
- Testing various endpoints also simulating internal attackers
- Verifying internal application infrastructure and network design

Development and architecture e-infrastructure component

- Software design based on existing hardware
- Secure boot, communication, data storage...
- Embedded Linux Operation System
- High security requirements
- C, Bash, Hardware Security, Production
- Agile Development
- Consultancy & Training to employees

Security Evaluation Automotive Head Unit

- High safety and security requirements
- Team lead, 3 person team
- Embedded Linux OS including Software and Hardware: C, C++, Assembly, Hardware Security

Security Evaluation Digital Rights Management System

- Cryptographic attacks, Billions of assets and 300-500 Million users affected
- Team lead, 3 person team, Training of junior consultant
- Linux, custom operation system, C, C++, Assembly

Development white box crypto attack tooling

- Internal tool development C, Python

Multiple Evaluations of Payment Systems for Retail

- Technical lead, single person projects
- Including Android, Mobile Security, Hardware Security, Java, C, Gitlab, Git

Employment History

Riscure B.V.
Security Analyst

Delft, Netherlands
Jan 2015 – Jan 2019

- Performing evaluations mostly in the markets of embedded products, payment and content protection worth several 100.000€ a year
- Emerging technologies including Trusted Execution Environments and Host-Card Emulation
- Freeform or requirements driven evaluations
- Handling of technical communication to customers both remote and on-site
- Performing and designing of external and company internal trainings
- Development of hardware/software tools for evaluations
- Languages:
 - C, C++, Python, assembly x86, assembly MIPS, other assemblies, Bash , Shell, PHP, Java, Android Java, Kotlin,
- Operation environments:
 - Linux, embedded Linux, u-boot, ARM trusted Firmware, Android, custom systems
- Architectures:
 - ARM, x86, MIPS
- Development environments:
 - Eclipse CDT, Eclipse Java, GIT, Android Studio, IntelliJ IDEA

Riscure B.V.
Graduate Researcher

Delft, Netherlands
Feb 2014 - Juli 2014

- 6 month Thesis: “Exploring Effects of Electromagnetic Fault Injection on a 32-bit High Speed Embedded Device Microprocessor” (www.essay.utwente.nl/65596/)
- ARM Assembly, C, Python, TI development environment

Security Research Labs Berlin
Security Specialist

Berlin, Germany
Nov 2012 - Dec 2013

- Development and research in the field of embedded devices, hardware security, Android and mobile communication.
- Phone, Malware and embedded system reverse engineering

Festool GmbH
Junior Software Developer

Wendlingen, Germany
May 2011 - Sep 2011

University of Stuttgart
Java Tutor

Stuttgart, Germany
Apr 2010 - Jul 2010

Institute for machine parts
Research Assistant

Stuttgart, Germany
Oct 2009 - Jan 2011

Board positions

Stichting De Gymzaal
Treasurer

De Hague, Netherlands
Jan 2022 - Aug 2025

- Managing the financial aspects of a ~500k€ renovation project to convert a former sport hall into a community space
- Advising the remaining board members on the financial aspects of decisions
- Creating the balance, budgets and communication with funds and suppliers

Stichting Intra Muros
Treasurer & Renovation manager

Delft, Netherlands
Oct 2015 – April 2025

- Managing the financial aspects of the non-profit foundation for maintaining a history building
- Managing renters
- Planning and executing renovations

Education

EIT ICT Labs Masterschool
MSc Security and Privacy

Netherlands &
Berlin, Germany
May 2012 - Aug 2014

- Quadruple Security and Privacy Master at the TU Berlin, Germany and the TU Twente, TU Eindhoven RU Nijmegen, Netherlands
- Additional Innovation and Entrepreneurship Minor

University Stuttgart
BSc Electrical and Information Eng.

Stuttgart, Germany
Oct 2008 - Apr 2012

Awards and Scholarships

EIT ICT scholar

May 2012 - Aug 2014

- European scholarship program awarded for academic excellence. Financial support for complete study costs, living costs and study related travel expenses.

Other qualifications

Industrial climber

2022

- Specialization rock wall stabilization

Master Electrician

2023

- Certification according to German TREI