

Catalin Triculescu

SYSTEM & FUNCTIONAL SAFETY ENGINEER

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PROFESSIONAL SUMMARY

System & Functional Safety Engineer with 13+ years taking safety-critical automotive systems from concept to production — across passenger cars, electric and autonomous vehicles, construction equipment, and electric hypercars. Proven across the full safety lifecycle (HARA, functional and technical safety concepts, FMEDA/FTA, and safety-case ownership up to ASIL D) under ISO 26262, ISO 21448 (SOTIF), ISO 13849, ISO/TS 5083, IEC 61508, and A-SPICE. An early adopter who pairs rigorous safety engineering with modern tooling: I build my own AI-assisted engineering tools — a full-stack requirements-management web app and an FTTI simulation tool — to make safety work faster, more traceable, and more evidence-rich. Equally effective in safety management, system engineering, and hands-on development, and adaptable across domains, standards, and countries.

WHAT SETS ME APART

Safety expertise, amplified by AI

Use LLM-assisted workflows to accelerate HARA documentation, requirements tracing, and FMEDA/FTA analysis, and build bespoke engineering tools with AI-assisted development. Actively tracking ISO/PAS 8800 for AI safety in road vehicles.

Early adopter, safety-grounded

Among the first to train on ISO/TS 5083:2025 for automated driving. Adopt new standards, microcontrollers, and toolchains early — always balanced against ASIL rigor and a defensible safety argument.

Adaptable across domains & roles

Delivered for 6+ OEMs and Tier-1s across 5+ countries, spanning BCM software, eDrive, and autonomous-truck validation — and moving fluently between software engineering, system engineering, and safety management.

CORE COMPETENCIES

FUNCTIONAL SAFETY

ISO 26262 (ASIL A-D) Safety lifecycle & management HARA Functional & technical safety concepts FMEDA / FMEA / FTA / DFA
SPFM / LFM & FIT analysis Safety-case ownership SEooC

STANDARDS & PROCESS

ISO 13849 ISO/TS 5083 (ADS) ISO 21448 (SOTIF) IEC 61508 ISO 12100 / ISO 13850 A-SPICE
ISO/PAS 8800 (AI safety) — readiness

SYSTEMS & EMBEDDED

System engineering & architecture Requirements engineering & traceability AUTOSAR MISRA C / embedded safety mechanisms
AURIX / Renesas / safety SBCs Vehicle-dynamics & FTTI simulation

AI & MODERN TOOLING

AI-assisted development (Claude Code, Gemini) Full-stack tooling (Fastify, PostgreSQL, JS SPA) LLM-assisted safety documentation
Custom safety-engineering tools

ENGINEERING TOOLS

SystemWeaver, IBM DOORS, IMS RV&S, Jama medini Analysis, APIS IQ-RM, SISTEMA Enterprise Architect, Rhapsody

PROFESSIONAL EXPERIENCE

System Safety Expert — AstaZero at Research Institutes of Sweden

January 2025 – Present

Gothenburg, Sweden (remote)

A Test Robot that validates autonomous trucks by physically simulating the ADS needed a defensible safety case — and the existing tooling could not produce the traceable requirements and FTTI evidence the safety argument demanded.

- Own all safety activities for the Test Robot, defining safety concepts and validation strategies for SAE L3-L4 test equipment under ISO/TS 5083 and ISO 13849, and managing the safety-case evidence.
- Built an AI-assisted full-stack Requirement Management web app (vanilla-JS SPA, Fastify 5, PostgreSQL 16 with append-only history and immutability triggers, JWESessionAuth) to make requirement traceability and safety-case evidence first-class — delivered end-to-end as solo engineer.
- Developed a simulation tool that computes Fault Tolerant Time Interval (FTTI) for vehicles on a closed proving ground, modelling vehicle dynamics and failure-response timing per ISO 26262 to underpin the safety concept.
- Performed vehicle-dynamics and failure-mode analysis on the test track to verify safe behaviour of the validation equipment.

SKILLS GAINED

ADS / ISO/TS 5083 validation

Safety-case ownership

AI-assisted full-stack development

Requirements engineering tooling

Vehicle-dynamics & FTTI simulation

Product Safety Engineer — Continental AG

September 2022 – January 2025

Markdorf, Germany (remote)

A cross-domain High-Performance Computing platform with gateway capabilities for a German OEM had to reach ASIL B(D) across multiple microcontrollers without compromising performance.

- Drove the functional safety of the SW development for an ASIL B(D) HPC + gateway platform, ensuring compliance of safety concepts and requirements.
- Specified and verified safety mechanisms on Aurix TC39x and Renesas RL78 microcontrollers — build-in self-tests, Watchdog Manager, and deadline monitoring — achieving SPFM/LFM targets verified by FMEDA at MCU and system level.
- Configured and validated CAN E2E protection and a TLF35584 SBC to close system-level safety gaps, and reviewed compiler settings to align build integrity with safety requirements.
- Conducted impact analyses, raised problem reports, and compiled safety-case reports to document compliance and safety measures.

SKILLS GAINED

HPC & gateway safety

Multi-core safety mechanisms

FMEDA (SPFM/LFM)

CAN E2E / SBC configuration

Safety-case reporting

Functional Safety Expert (Part-time) — Volvo Construction Equipment

December 2022 – February 2024

Braås, Sweden (remote)

A first-of-its-kind fully electric, autonomous transport system (the Red Dot Award-winning TA15) needed functional safety processes built from the ground up across both ISO 26262 and the machinery world of ISO 13849.

- Developed and rolled out functional safety processes and methodologies for fully electric autonomous transport, ensuring compliance with ISO 26262 and ISO 13849.
- Conducted hazard analysis and risk assessment (HARA) and fault tree analysis (FTA), defining safety measures to mitigate identified risks.
- Reviewed and approved safety plans, safety cases, safety analyses, and compliance files, and delivered training to embed safety practices team-wide.

SKILLS GAINED ISO 13849 + ISO 26262 for off-highway Safety process design HARA / FTA
Safety training delivery

Functional Safety Manager — GKN Automotive

October 2018 – September 2022

Lohmar, Germany

Electric all-wheel-drive / eDrive programmes for German OEMs had to be managed to the highest integrity level — ASIL D — while coordinating suppliers and governing a phased path from proving ground to public road.

- Led functional safety management up to ASIL D for AWD/eDrive engineering teams, including supplier safety coordination and technical analysis of hazardous events, with verification aligned to project milestones.
- Defined, implemented, and verified Technical Safety Requirements and Technical Safety Concepts, and designed system- and software-level safety mechanisms (AURIX TC23x internal HW mechanisms, voltage monitoring, EL MOS driver monitoring, start-up MCU test, SafePath testing).
- Analysed third-party safety manuals (AURIX TC23x, TLF35584, Vector OS, AURIX SafeTlib) and performed AURIX FMEDA to recalculate SPFM/LFM from FIT rates.
- Created a progressive safety checklist keyed to the Usage Restriction Level (trained driver, proving ground, public-road deployment), ensuring every safety mechanism was validated before each release; guaranteed testing, timing, A-SPICE, and ISO 26262 compliance.

SKILLS GAINED ASIL D safety management eDrive / AWD safety mechanisms Supplier safety coordination
FMEDA / FIT A-SPICE Progressive deployment governance

System Engineer — HELLA KGaA Hueck & Co

March 2018 – October 2018

Craiova, Romania

The 3rd-generation Trailer Tow Module had to become a scalable, cost-optimised platform serving multiple OEM customers — without losing ASIL B compliance or slipping time-to-market.

- Led development of a scalable, multi-customer Trailer Tow Module platform with an updated architecture, reducing cost and improving time-to-market while maintaining ASIL B compliance.
- Analysed and refined customer requirements into clear system requirements and led system-level architectural design with technical reviews to validate design decisions.
- Executed safety analyses and risk assessments feeding the safety case, and established requirement traceability and test coverage for end-to-end validation.

SKILLS GAINED Product-line / platform architecture Cost optimisation
Requirements engineering & traceability System architecture

Functional Safety & Vehicle Motion Engineer — NEVS

October 2016 – February 2018

Trollhättan, Sweden

A new electric-vehicle platform needed a coherent vehicle-level fault-management, safe-state and degradation strategy — including the hazards of the high-voltage battery — to keep vehicle motion safe and reliable.

- Defined a vehicle-level fault management strategy with fault-mitigation measures, and ran system-level safety-mechanism analysis to allocate mitigations to architectural elements.
- Analysed Active Short Circuit (HV battery) and back-EMF effects against battery state-of-charge, and defined safe states for architectural elements.
- Developed a warning and degradation concept for vehicle motion, improving overall safety and performance, and supported the functional safety concept and system design with ISO 26262 safety analyses.
- Managed supplier interactions and component integration, and improved internal team coordination by introducing Agile ways of working.

SKILLS GAINED EV / HV-battery safety Fault management & degradation Active Short Circuit analysis
Supplier coordination Agile

Functional Safety Manager — HELLA KGaA Hueck & Co

August 2015 – October 2016

Craiova, Romania

An ASIL B Trailer Tow ECU (trailer light and hitch control) had to be delivered as a single platform to three leading German OEMs, each demanding full safety-case evidence and a clean customer safety interface.

- Led functional safety management for the ASIL B Trailer Tow platform delivered to three leading German OEMs, owning the safety case and acting as the customer safety interface.
- Supported the acquisition phase with preliminary safety architectures and cost estimations, then defined safety requirements and concepts and refined them into software- and hardware-allocated requirements.
- Implemented Renesas RH850 and UJA11xx watchdog safety mechanisms — program-flow monitoring, RAM/ROM/MPU tests, voltage monitoring, and freedom-from-interference — and ran FTA, SPFM/LFM, and SW-architecture safety analyses.
- Supported the AUTOSAR SW-C platform as a Safety Element out of Context (SEooC), provided ISO 26262 training, and ensured A-SPIICE 2.0 (ENG2-ENG8) compliance for Safe IO modules.

SKILLS GAINED End-to-end safety management Safety-case ownership Customer safety interface SEooC
AUTOSAR & A-SPIICE HW/SW safety mechanisms

SW Engineer — HELLA KGaA Hueck & Co

March 2013 – August 2015

Craiova, Romania

A high-end Body Control Module for a top German OEM — managing lighting, locking, seat heating and gateway functions — required an ASIL B rating because exterior lighting is safety-critical, demanding rigorous embedded safety mechanisms and trustworthy third-party software.

- Developed AUTOSAR software modules in ANSI C to MISRA compliance and implemented safety modules monitoring exterior-light current consumption via ADC/DMA.
- Implemented Technical Safety Concept measures (CoreTest, MPU Test, ECC Test, RAM/ROM tests) and configured the TTTech Watchdog Manager (WdgM) for alive, program-flow, and deadline monitoring.
- Integrated and verified third-party software — analysed and configured the Vector OS safety manual for Renesas RH850, compared ARXML to ECU configuration, and set up MPU/memory layout and trusted/non-trusted function-call separation.
- Ran T1 Gliwa runtime measurements and performed code optimisations to improve system performance.

SKILLS GAINED AUTOSAR MISRA C Embedded safety mechanisms
Third-party SW integration & safety-manual analysis Runtime optimisation

SELECTED CONSULTING ENGAGEMENTS

Rimac Technology

Supported Electric Drive Unit (EDU) development and functional safety for the Rimac Nevera electric hypercar — EDU developed to A-SPIICE Level 2 and ASIL D, with torque-vectoring safety integration.

Hyperdrives

Functional-safety consulting for hollow-conductor-cooled electric motors achieving ~3x higher current density, supporting automotive-grade power units with integrated SiC inverters.

EDUCATION

Master's Degree in System Engineering

October 2014 – July 2016

Faculty of Automatics, Computers and Electronics, Craiova

Bachelor's Degree in Computer Science

October 2007 – July 2011

Faculty of Automatics, Computers and Electronics, Craiova

CERTIFICATIONS & TRAINING

- Introduction to ISO/TS 5083:2025 — Automated driving safety (2024, pre-publication)
- Functional Safety for System Engineers — Vector (2018)
- System Engineering Workshop — Vector Austria (2018)
- Hazardous Voltage — Green + Yellow Level (2017)
- Functional Safety for Safety Managers (2015)

DELIVERED AS TRAINER

- Introduction to Functional Safety (ISO 26262)
- Functional Safety for Software Development
- Functional Safety & AUTOSAR (Vector solution)

STANDARDS

- ISO 26262:2018 — Road vehicles, Functional safety
- ISO/TS 5083:2025 — Safety for automated driving systems
- ISO 21448:2022 — Safety of the intended functionality (SOTIF)

- ISO 13849-1:2015 — Safety-related parts of control systems
- IEC 61508:2010 — Functional safety of E/E/PE systems
- ISO 12100:2010 / ISO 13850:2015 — Machinery safety & emergency stop
- IEC 61025:2006 (FTA) / IEC 60812:2018 (FMEA)

LANGUAGES & ADDITIONAL

Romanian

Native

English

Fluent (professional)

German

Professional working

French

Conversational

Driving licence: B • Interests: Hiking, Skiing, Running

