

Philip Koopman, Ph.D.

<https://bit.ly/PKoopman> ● Pittsburgh PA, USA

Key Areas of Expertise:

- Embedded systems: architecture, software/firmware, safety, security, testing, embedded networks
- Autonomous system safety, testing, regulatory policy; self-driving car safety
- Design reviews, lightweight software process improvement, software improvement workshops
- Experienced educator & speaker for tutorials, workshops, media, international keynotes

Key Experience:

- Tenured Faculty, ECE Dept., Carnegie Mellon University; Emeritus status as of 2025
- United Technologies Research Center: varied embedded system applications
- Harris Semiconductor: CPU designer
- Startup company founder: autonomous vehicle safety; CPU design; hotel automation systems
- Originator: ANSI/UL 4600 safety standard for autonomous vehicles
- Education & testimony for US Congress, US State Governments, and international stakeholders
- Author of books on embedded software quality and safety, self-driving vehicle safety
- Author of papers on embedded software quality, autonomous vehicle safety, and robust systems
- Named inventor on 27 US patents covering automotive, elevators, autonomous vehicle safety, network protocols, location-aware services, and CPU design
- US Navy: Submarine Officer; Engineering Duty Officer; combat veteran status
- PhD in Computer Engineering, Carnegie Mellon University

Key Skills:

- Embedded software process quality improvement
 - Emphasis on continuous improvement and just-right level of rigor
 - Improving Vee, Agile, hybrid process models responsive to software quality pain points
 - Improving team technical skills responsive to product technical & quality pain points
 - Lightweight approaches to requirements, architecture, design, source code quality, testing
 - Specialty skills in embedded system safety & embedded-specific security issues
 - Long ago lost count of how many programming languages, assembly languages, etc.
- Embedded system design reviews
 - Multiple hundreds of industry design reviews of embedded products (architecture, software, engineering processes, quality assurance, safety, security, some hardware)
 - Application domains include: automotive, elevators, rail transportation, lighting controls, thermostats, water heaters, power switching, power supplies, data center infrastructure, ultrasonic welding, flow meters, flow control valves, pressure transmitters, compressors, HVAC controls, adaptive maintenance monitors, motion controllers, ultrasonic inspection, automated vending, robots, baby products, power plants, smart card security, power hand tools, lawn mowers, aviation, medical equipment, cell tower equipment.

Other Information:

- Personal home page (papers, pointers to social media) <https://users.ece.cmu.edu/~koopman/>
- Educational videos, keynote talks & podcasts <https://bit.ly/KoopmanTalks>
- CMU course: Embedded System Software Engineering <https://bit.ly/ece642>
- Book: Better Embedded System Software (2021, revised) <https://bit.ly/BetterEmbSW>
- Book: How Safe Is Safe Enough? (2022) <https://bit.ly/SafeEnough>