SRIVATSAN VARADARAJAN

TECHNOLOGY FELLOW | SCIENTIST | INNOVATOR | ENGINEERING LEADER

P 612-275-3931 | E vatsan@gmail.com | A 14709 Pinto Ln, Rockville, MD 20850 | W vatsan1729.github.io

EXECUTIVE PROFILE

- Research scientist with an enduring passion for engineering large, complex, safety & security critical cyber-physical systems and a technologist at heart that derives satisfaction from maturing concepts to prototype and transitioning them to fielded products.
- Over 20 years research and technology development experience that include securing $MM grants in external research contracts, developing breakthrough technologies in internal projects for Aerospace, Defense, Space, and Industrial products, providing engineering leadership roles on successful execution of large-scale projects and building global teams, fostering collaboration amongst them while also mentoring junior scientists and engineers.
- Drive strategy initiatives, as an engineering fellow, to help shape product features anticipating marketplace/customer needs, develop technology roadmaps for Safe Autonomous Systems group within Honeywell Advanced Technology which supports Unmanned Aerial Systems (UAS) and Urban Air Mobility (UAM) side of the Aerospace business.
- Research areas include AI/ML technologies for autonomy, certifiable software, formal methods (e.g., model checkers, theorem provers) for automated verification and cybersecurity. Extensive expertise in design/analysis of safety/security in critical systems and development of distributed, fault-tolerant networks, wireless communications and dependable, embedded hardware and software platforms.

TOP SKILLS

- Systems Engineering
- Research & Development
- Avionics Design
- Model-based Systems
- Cybersecurity & Safety
- Embedded Systems
- Safe Autonomy
- Certifiable ML/AI
- Architecture
- Simulations, Prototypes

TRAININGS & CERTIFICATIONS

- Six Sigma Green Belt
- Leadership Skills & Strategic Marketing

EDUCATION

- Ph.D. Computer Science
- M.S. Mathematics
- M.S. Computer Science
- M.M.S. Master of Management Studies with specialization in Information Sciences

PROFESSIONAL ACTIVITIES

- Oversee R&D projects in the core areas of certifiable platforms and assurance technologies for autonomous avionics systems.
- Lead principal investigator and/or program manager for projects funded by DARPA, NASA, ONR, DHS and AFRL
- Performed flight tests
- Industry standardization and aerospace regulatory working group activities with FAA/EASA/RTCA/AIA/AVSI
- Program committees, conference session/track chairs, conferences/journals referee for IEEE, ACM

HONORS – AWARDS

- NASA Johnson Space Center Group Achievement Award
- Honeywell Aerospace Technical Achievement and Outstanding Engineer Awards
- Corporate Research and Innovation Awards

EXPERIENCE

2001 - Present | Advanced Technology, Aerospace, Honeywell
Roles (recent first): *Engineering Fellow (current)*, Staff Scientist, Principal Scientist, Senior Research Scientist

- *Certifiable ML/AI for Assurable Autonomous Avionics:* Internal RDE project lead for assurance of perception sensors based automatic landing assists, developing explainable methodologies for increasing trust/confidence of inference engine's correctness and leveraging verifiable runtime monitors for safety case of contingency handling of nominal/off-nominal situations during (semi) autonomous operations for UAM and UAS Cargo. Generate compliance evidence artifacts for ARP 4754/DO-178C/DO-254 & ARP 4761 (safety).

- *Certifiable Hardware and Platform Software for Next Generation Avionics:* Spearheading Certifiable Multicore RTOS platform technology from concept to TRL 6 for a hybrid ARINC 653/RMA solution that results in lower size, weight and power, lower certification costs and higher throughout performance, and therefore is a critical enabler for expanded offerings as well a scalable products & functions integration on a single platform. Developing a time-space partitioned approach for GPUs and hardware accelerators that enable AI/ML inferencing engines for autonomy applications to coexist with traditional avionics (e.g., displays).

- *Automated Rapid Certification of Software (ARCOS):* Lead PM/PI for an ongoing DARPA program generating evidence and assurance cases for complex avionics software. We developed certified software components for Advanced Failsafe function that handles contingencies for an Ardupilot rotorcraft platform performing autonomous surveillance missions. We developed a property/outcome driven approach, in contrast to traditional process driven compliance, leveraging automated logic/reasoners, to certify Boeing's Apache AH64 software components using safety and security assurance cases. Enabling incremental certification satisfying DO-178C/DO326A or Overarching Properties (OP). Developed RMF security assessment based on CAPEC attack analysis, CVE/CWE vulnerability analysis and NIST 800.53 control analysis.

- *Building Resource Adaptive Software Systems (BRASS):* Led the DARPA project to demonstrate adaptable software with assurance on a ROS/RADL platform for F1/10 autonomous car and a Segway robot equipped with LIDAR, IMU, GPS and Camera sensors. We developed Extended Kalman Filters (EKF) based navigation software that was robust to sensor failures, an adaptable sensor processing algorithm for a vision-based feature extraction under extreme weather and poor lighting conditions and vehicle path planner for dynamic mission objectives.

- *NASA Orion C3I Network Router and CEV TTE Network:* Led the systems development team within Honeywell for joint development with Lockheed for the NASA Constellation project which was essentially an IP-based Network Router to support command & data-handling, telemetry, other real-time traffic like audio/voice and video traffic. Part of the team that designed and developed a fault-Tolerant Time Triggered Ethernet (TTE), a next generation avionics networking ethernet solution that supports mission critical on-board communication architecture for the Orion Crew Entry Vehicle (CEV) manned space program. TTE SAE AS6802 Standard: https://www.sae.org/standards/content/as6802.

PATENTS & PUBLICATIONS

Over 30 conference and journal papers

Over 25 Patents*

WORK HISTORY

- 2001 – 2024 (current)
  Honeywell Aerospace
  Fellow, Scientist
- 1998
  IBM Almaden Research Center
  Summer Intern
- 1996
  Bell Labs, Lucent Technologies
  Summer Intern
- 1996 – 2004
  University of Minnesota
  Guidant Fellow, Graduate Teaching Instructor, Research Assistant, Teaching Assistant
- 1994 - 1995
  Fujitsu, ICIM
  Software Engineer
- 1990 – 1994
  Birla Institute of Technology and Science (BITS), Pilani, India
  Undergraduate Lab Assistant

CITIZENSHIP

United States

REFERENCES

Available upon request

LINKEDIN

linkedin.com/in/srivatsan-varadarajan

* Scan QR Code to access publications and patents on Google Scholar