Marcus Stephen Fisher

+1 (304) 517-4750

Marcus.S.Fisher@gmail.com

156 Pounds Hollow Rd. Morgantown, West Virginia (WV) 26508

- Security Clearance: Top Secret (TS) / Sensitive Compartmented Information (SCI)
- LinkedIn: https://www.linkedin.com/in/marcus-fisher-83129877
- GitHub: https://github.com/msfisher

---

1. Professional Summary

Innovative and results-driven engineering leader with 28+ years of experience in systems engineering, software development, cybersecurity, and academic program development. Proven success in managing large-scale Research & Development (R&D) initiatives, securing funding for advanced labs, and leading multidisciplinary teams in both government and academic sectors. Expert in program management, requirements engineering, cybersecurity operations, and engineering education. Recognized for building collaborative, safe, and innovative cultures that foster technological advancement and value delivery.

Executive Management

- Directed enterprise-wide engineering programs by setting clear goals, ensuring organization-wide alignment, and maintaining focus through strategic communication and visual management tools such as Kanban boards and weekly standups.
- Applied a bottoms-up planning strategy to identify tasks and estimate resources, integrated with continuous risk management for proactive mitigation.
- Championed a workplace culture rooted in safety, innovation, lessons learned, and best practices—ensuring psychological safety, cross-functional efficiency, and value-driven outcomes for stakeholders.

Academic & Curriculum Development

- Developed multi-level STEM curricula and labs across middle school to graduate-level programs, with specialization in programming (Python, Java, C/C++, JavaScript), robotics, IoT, drones, and cybersecurity.
- Created university-level academic tracks in systems engineering, cybersecurity, and verification & validation at institutions such as West Virginia University (WVU) and Fairmont State University (FSU).
- Secured federal and state grants to establish advanced laboratories, including a fully functional Security Operations Center (SOC) at FSU.
- Author of a graduate-level software engineering textbook used in WVU's curriculum.

Research & Development Leadership

- Led systems and software engineering R&D programs focused on Verification and Validation (V&V), cybersecurity, Machine Learning and Artificial Intelligence (ML/AI), and autonomous systems, collaborating with academic and industry partners across national and international initiatives.
- Applied a portfolio management approach to balance innovation with risk, and established WVU's Advanced Technologies Laboratory for research-to-practice transition.
- Organized monthly technical seminars and an annual research conference to foster knowledge exchange and innovation dissemination.

Engineering & Systems Design

- Directed system engineering life cycle activities from requirements elicitation to system design, decomposition, simulation, and V&V using IEEE standards and modern CASE tools (DOORS, MagicDraw, SysML, UML).
- Designed and analyzed system architectures using tools such as Matlab, Simulink, OSATE, and MagicDraw; performed embedded systems development across platforms including Arduino, Raspberry Pi, TI TMS320, and BeagleBone.
- Experience in designing and analyzing architectures that met the system's needs and requirements. Utilized various methods and tools that include OSATE (AADL), MagicDraw (SysML), Matlab and Simulink, control and process specifications, and various diagramming techniques.
- Developed and tested software in multiple languages including C/C++, Python, Java, Ada, Assembly Fortran, Cobol, JavaScript; leveraged modern IDEs such as Eclipse, Code Blocks, JBuilder, Code Composer, NetBeans, Visual Studio, PyCharm, and cloud platforms like GCP.
- Some experience with embedded systems on various platforms such as arduino, handyboard, 8051, AX-11, beaglebone, raspberry pi, Synapse EZ100, android, and TI TMS320F28335.
- Experience in validating and verifying systems including modeling and simulating requirements, architectures & code, establishing validation and verification plans, verifying implementation and developing test procedures and test scripts using STOL/CSTOL languages and other testing tools (i.e. VectorCAST, Junit, CUnit, PyTest).

Cybersecurity Engineering & Operations

- Led expert cybersecurity teams delivering threat intelligence, control assessments, secure system architecture integration, and full-spectrum penetration testing (cyber and physical).
- Managed security assessments from engagement scoping (ROEs) to vulnerability exploitation and final reporting, utilizing virtualized environments for operational safety.
- Conducted offensive security testing on mobile and web applications, with a strong focus on real-world threat modeling and zero-day vulnerability identification.

---

2. Work Experience

Aerospace Technologist (AST) Systems Software Engineer – NASA GSFC Code 180
May 26, 1998 – Present

Currently serving in roles as senior fellow, modeling and test lead, and cybersecurity lead.

- Senior Technical Fellow at NASA Goddard Space Flight Center (GSFC) serving as a senior advisor to the Center Director on technical challenges as well as strategic direction for the Agency. As an example, I was tasked to understand quantum computing to understand how the technology may be utilized for NASA missions.
- I also serve as Modeling and Test Lead for Artemis missions going back to the Moon, in which I utilize MagicDraw and Cameo simulation toolkit to establish expected system behaviors for landing Astronauts on the moon and returning them home safely. I am also responsible for establishing the testing strategies to be used to ensure system software is safe, secure, and reliable prior to any of the Artemis missions.
- I also serve as the cybersecurity lead ensuring NASA's critical infrastructure is secure and resilient from cyberattacks. In this capacity I establish the technical approaches, management plans, and rules of engagement and then lead a team of subject matter experts to conduct penetration tests on NASA's systems.

Since 1998, I have served in numerous roles within NASA in which I summarize below.

Chief Engineer – NASA GSFC Code 180

- I served as the Chief Engineer for the NASA IV&V Program within NASA's Office of Safety and Mission Assurance (OSMA). I was responsible for the technical performance of all NASA IV&V projects, defining and developing best engineering practices, performing special studies for the advancement of NASA's technologies, integrating best engineering practices into the development of NASA missions, capturing, and integrating lessons learned for the Agency, and overall risk management for the IV&V Program.
- Responsible for leading multiple engineering and management teams for identifying the technology roadmaps for the future and then implementing such roadmaps. I was held accountable for the technical performance of all engineering projects as well as interfacing and communicating with our stakeholders and customers at NASA Headquarters and other NASA Centers. Example projects include establishing the testing and simulation capabilities for our Artemis missions in getting humans back on the moon and investigating assurance practices for machine learning subsystems that are to be integrated into our system architectures.
- Responsible for 22 NASA IV&V projects totaling $28 million dollars.

Associate Director – NASA GSFC Code 180

- I served as the Associate Director for the NASAIV&V Program within NASA's Office of Safety and Mission Assurance (OSMA). My primary responsibilities included defining the Program's strategies and commitments for the Agency, advancing the organization's technical capabilities, and managing the Program's resources while securing additional (non-NASA) reimbursable projects to fulfill the mission of the Program.
- I held supervisory responsibilities for the NASA staff and was responsible for managing civil servants and contractors to achieve our mission for the Agency. The Program had an annual budget of 45 million dollars, 46 civil servants, and 175 contractors distributed throughout the United States.
- I had the responsibility for collaborating and interfacing with the European Space Agency (ESA) and the Japanese Space Agency (JAXA) for the purposes of ensuring all Agencies share and understand the best practices in software engineering and V&V.
- As Associate Director I had successfully acquired new business (i.e. I acquired a new project with the city of New York for 19 million dollars with the purpose of providing V&V to the City of New York's enhanced automated 911 System).
- I had advanced the Program's capabilities by developing NASA's independent testing strategy which is software-only simulation allowing our workforce to be more agile in testing off-nominal situations.
- I had developed a cyber-security capability for the Program which now provides cyber security training, vulnerability analysis and penetration testing services, and secure coding knowledge for NASA's software developers.
- Within our Program I built the Jon McBride Software Testing and Research Laboratory (JSTAR), which provides independent testing for NASA missions as well as advances concepts and technologies for the Program. As an example, one of our Program's responsibilities is to provide testing support for an asteroid rendezvous mission that will be employing computer vision solutions to approach and acquire an asteroid. Our Program was not familiar with computer vision solutions used during real-time mission operations and as such I stood up a team and established the vision and objectives for us to develop and deploy testing strategies for mission's employing these technologies for rendezvous and docking operations.
- I have established the research direction for future capabilities needed by the Program such as the use of parallel processing to improve test coverage and test time, extensible rule checking for automatic defect identification via static code analysis, and simulation of software architectures in a model-based systems engineering environment.

Systems Engineer – NASA GSFC
Greenbelt, MD

- I was one of seven individuals throughout NASA selected into the Systems Engineering Education and Development (SEED) Program as a Systems Engineer in training for NASA missions. While at Goddard Space Flight Center (GSFC) I was formally trained in the theoretical aspects of Systems Engineering and acquired hands on training as a systems engineer on NASA missions, including developing requirements, developing system architectures, and integration and test of NASA missions.
- Actively worked the James Webb Space Telescope (JWST) and Lunar Reconnaissance Orbiter (LRO) missions as a systems engineer. Even though NASA is not a degree granting organization, I acquired two years of formal and hands on training that has enabled me to be a highly capable leader for NASA's future endeavors.
- Responsible for leading a team of systems engineers for the NASA Engineering and Safety Center (NESC) to support returning the Space Shuttle back to flight status after the NASA Columbia tragedy in 2003. My work assessed the engineering approach NASA employs to determine probability of impacts to the Space Shuttle vehicles from orbital debris and micrometeoroids. The study focused on determining whether or not the current approach taken by NASA was adequate to determine the probability and locality of impacts to the Space Shuttle. The study was critical in returning the Space Shuttle to operational status.

Chief of Research and Development – NASA Office of Safety and Mission Assurance (OSMA)

- As chief of research and development I was responsible for managing NASA's R&D efforts and West Virginia University's R&D efforts relative to software assurance. Leadership and management responsibilities included:
    - Establishing and managing the research program using a portfolio-based approach in which research results, costs, targeted goal, principal investigator, and risk of performing the research are all integrated in order to select and fund the best research projects that provide the maximum return of value given the research program's mission and strategies.
    - Establishing the mission and vision for the research program. Developing strategies to achieve the mission of the research program and effectively communicating the strategies to potential collaborators as well as the engineering community.
    - Assessment of research budget and schedules using Earned-Value metrics, performing assessments of the technical/scientific merit of individual research projects and providing guidance and direction to the Principal Investigators during research implementation. Maturation of technologies coming out of research was modeled using Technology Readiness Levels to ensure the Research Program was balanced in both applied and basic research.
    - Developing and establishing synergy between industry/government projects and Research to ensure research results are effectively transitioned into practice.

- Establishing effective lines of communication to understand workforce needs and the dissemination of research results.
- Developed and hosted the Software Assurance Symposium for three years in a row that resulted in an average of 275 attendees visiting the local community and understanding the research capabilities offered to the engineering community.
- Established a monthly working group that brought on average 50 research practitioners to WV to discuss the Research Program's vision and strategies. An indirect benefit was sought after to increase the synergy between our local researchers and practitioners outside WV.
- Developing projects, interfacing with various Universities for recruitment purposes, attending and presenting at various technical seminars, and solely in charge of identify and recruiting the highest achievers within academia.

---

3. Academic Experience

Assistant Professor – Fairmont State University (FSU)

2015 - 2020

- My responsibilities included developing and delivering several courses as well as advising roughly 35 undergraduate students.
- I was responsible for maintaining Association of Collegiate Business Schools and Programs (ACBSP) accreditation by establishing program plans and course assessments.
- I was responsible for establishing collaborations with our stakeholders to create internships for our students as well as research projects for our professors. During my time, I established collaborations within the region that resulted in over 90% of our graduates being employed upon graduation.
- I established a Cyber Security track for the Program in which we offered courses in cybersecurity and provided cyber security services to the public. I secured funding to develop cyber security track for the Master Of Business Administration (MBA) as well as build security operations center (SOC) for the University that served the University's regional stakeholders. This SOC is the first of its kind in not only training students but also providing valuable services to our customers.
- Courses that I was responsible for teaching included Application Development and Object-Oriented Technologies, Database Design and Development, Information Systems Business tools, Systems Analysis and Design, Operating Systems, E-Commerce and Web Technologies, and Information Assurance and Cyber Security.

Adjunct Professor – West Virginia University (WVU)

1997 – 2012

- My responsibilities included developing programs which included laboratories for advancing the research capability of WVU, developing course curriculum, developing course materials, developing projects and exams, mentoring graduate students, and performing research and development.
- I successfully worked with local businesses, government agencies (e.g. NOAA, NASA, FBI), and international partners (e.g. European Space Agency (ESA), Japanese Space Agency (JAXA)) to establish an operational test center that explores potential technologies that are targeted for deployment in the field. I was successful in securing the funding and support and built the Applied Technology Laboratory (ATL) on the campus of WVU. This laboratory provides a physical presence for our stakeholder workforce to test out new ideas while actively interacting with the students at WVU. This enabled our students to obtain real world experience while providing a test capability for our partners in the community.
- For the Software Engineering Graduate Program I was responsible for developing the curriculum for Verification and Validation (V&V) courses. Not only did I successfully develop the course material, I wrote the textbook on V&V that is used throughout industry and government.

---

4. Consulting Experience

Systems Software Engineering Consultant
2007 - Present

Providing consulting services in the areas of systems engineering, software engineering, and cybersecurity. Services have included software testing and code analysis, cybersecurity services such as penetration testing and open-source intelligence research for threat analysis, and systems development. Example projects have included:

Intermodal Holdings Data Management Center (2019 – 2022)

I was responsible for architecting a data management center that ingested numerous field device telemetry and stored and shared the data with authenticated financial technology organizations. The data management center was built in compliance with NIST Special Publication (SP) 800-171 which is protecting controlled unclassified information. The data management center also sought an Authority to Operate (ATO) as the systems within the center had potential of interacting with federal systems. The data represented multi-modal transportation information (i.e. types of trucks on the interstates) and an array of deployed sensors across the northern part of WV. I was responsible for defining use cases and architecting a solution using MagicDraw and SysML modeling language. I was also

responsible for establishing requirements and security controls that needed to be implemented as well as conducting security control assessments and penetration tests.

Digital Forensics and Threat and Vulnerability Analysis (2018 – 2019)

I was responsible for developing an object recognition application to aid local law enforcement in analyzing terabytes of images for the purposes of identifying specific objects within images. Digital assets were seized and my application automatically scanned memory looking for specific objects within the pictures stored on the assets. Through the use of machine learners and Google cloud services the application was successfully deployed within local law enforcement agencies. I was also responsible for conducting Threat and Vulnerability Assessment (TVA) on local police department's network systems to strengthen their security posture.

Critical Software – Badger Meter (2016 – 2018)

I was responsible for testing and evaluating the Flow Meter subsystem within the Boeing KC-767 airplane. I was responsible for certifying the subsystem in compliance with DO-178B. This work required Hardware in the loop testing as well as unit-level testing. The subsystem was developed in C language with some assembly. VectorCAST testing tools were utilized to understand code coverage being obtained via the testing. All interactions with the customer were my responsibilities as well as with the testing results.

NOAA CLASS – GST System Test Assessment (2014-2016)

I was responsible for developing an optimal test strategy for the NOAA CLASS system, a ground system for acquiring raw data from a train of NOAA spacecraft. My project was organized as a sub-contract to the company Global Science & Technology (GST), which was responsible for overall testing on the CLASS system. My products were found to be valuable which resulted in follow on work to help guide the overall system test strategy for the NOAA ground system.

---

5. Education

- Master of Science (MS) Computer Science – West Virginia University (WVU)
  - Morgantown, WV / 2001
- Bachelor of Science (BS) Computer Science – WVU
  - Morgantown, WV / 1999
- Bachelor of Science (BS) Wildlife and Fisheries Biology – WVU
  - Morgantown, WV / 1996

---

6. Volunteer Experience

- High School Teacher / Trinity Christian School / Morgantown WV / 2019 - 2024
    - I volunteered as the STEM-specialist at TCS teaching classes at the middle school and high school. I developed the STEM curriculum and the laboratory for teaching computer programming (Java Script, Java, C, C++, Python), basic electronics, robotics and drone development, and cybersecurity.
- Vice President of Society for Amateur Radio Astronomers (SARA)
    - https://radio-astronomy.org/
    - As Vice President I am responsible for growing the organization and leading the annual conference. Current conference is conducted in Green Bank WV where I pull together members and nonmembers alike to promote the sharing of information in radio astronomy.
- WV Balloon Engineering for Atmospheric Research (BEAR)
    - https://wvbear.com
    - Successfully created a student initiative utilizing high-altitude balloon systems for atmospheric research, advancing technologies, and training the next generation of STEAM leaders. Led a team of students that developed designed, developed, operated, and recovered upper atmospheric flight systems.
    - During 2023 and 2024 my team was selected to participate in a NASA mission conducting atmospheric studies during the 2023 and 2024 solar eclipses. The team was part of the Nationwide Eclipse Ballooning Project (NEBP) in which we successfully flew two high-altitude balloon missions during the solar eclipses.
- The Fairmont State/Pierpont Community and Technical College Lifelong Learners is a membership driven, non-credit continuing education program for adults interested in remaining mentally and socially active. Lifelong Learners provides educational opportunities for area residents aged 50 and older, regardless of prior Fairmont State affiliation or educational background. Since 2005 I have supported the Lifelong Learners Program and have taught courses such as introduction to space flight and the International Space Station (ISS), the history of NASA, and going back to the Moon and eventually Mars. I am very proud to support this program and even though I am there to "teach" a particular topic, I end up learning a lot from the lively discussions and experiences that the residents have to offer.
- I have served on the Pastor Parish Relations (PPR) committee for Avery United Methodist Church in Morgantown WV. The PPR is the administrative unit where staff and congregational interests are integrated to focus on the mission of the church. The committee relates to all staff, both bishop-appointed staff and employed staff and has the same functions of a personnel office or Human Resources department in other organizations. Currently I serve as the Family Outreach Committee in which I primarily work on establishing events and initiatives to increase the participation of families in the church as well as increase the footprint the church has within the community.
- I have led and supported the School Supply Giveaway Program in which I organize local companies and government agencies, within the High Technology Corridor, to donate school supplies for underprivileged children. The first year that I started the program we collected school supplies to equip 16 children for the school year (kindergarten through high school). Within 5 years we had collected enough school supplies to equip 565

children for the school year! This initiative has experienced tremendous growth and can grow even larger. I find it unacceptable that children do not have the right equipment to attend our public schools and as such I make it my personal responsibility to help as many children as I can so that they can have school supplies to meet their basic needs.

- Monongalia Meteors Team
    - I led an elementary school group consisting of third, fourth, and fifth grade students in building a spacecraft that flew in low earth orbit (LEO) 11 times. No elementary school team in the world has ever built and flown a spacecraft, this team was the first and we successfully launched in April 17, 2019.

---

7. Publications

- January 2007, Software Verification And Validation: An Engineering And Scientific Approach, Springer Verlag, ISBN 0387327258
- December 2006, NASA Workshop for Knowledge Management and Leadership, “The Five Axioms of Leadership”
- April 2006, Software Engineering and Education Training, The Future Challenges for Educating IV&V Engineers
- January 2006, IEEE System Sciences, 2006, “Learning IV&V Strategies” Volume 9
- October 2005, 1st Annual ESA Workshop on Spacecraft Data Systems and Software, “Software Integrity Level Assessment Process: NASA’s Approach to Prioritizing Verification and Validation Resources for Mission Critical Software”
- October 2001, High Assurance Systems Engineering (HASE), "Automating Inspection Techniques for High Assurance Systems"
- May 2000, North Atlantic Treaty Organization (NATO) Commercial Off The Shelf (COTS) Products In Defense Applications "The Ruthless Pursuit of COTS", Technical Evaluation Report
- April 1999, Software Research Laboratory, “Estimating the Cost to Develop Software”