

Joshua “Logan” Grumbach, PhD

Email: jlg0021@uah.edu

Phone: 256-777-7062

EDUCATION

Bachelor of Science, Mechanical Engineering, University of Alabama in Huntsville, Huntsville, AL, August 2013

Master of Science in Engineering, Mechanical Engineering, University of Alabama in Huntsville, Huntsville, AL, May 2015

Master of Science, Aerospace Systems Engineering, University of Alabama in Huntsville, Huntsville, AL, May 2019

Doctor of Philosophy, Aerospace Systems Engineering, University of Alabama in Huntsville, Huntsville, AL, May 2022

SECURITY CLEARANCE

Active (Top Secret - SCI)

PROFESSIONAL EXPERIENCE

Vice President

Ignite Fueling Innovation, Huntsville, Alabama, 05/2024-Present

- Serve as Business Unit Lead for the Ignite Space, Intelligence, and Missile Defense portfolio encompassing 12 contracts across 10 customers including MDA, USSF, NASA, Army, Intel Agencies, and commercial partners.
- Manage profit and loss (P&L) for the portfolio of approximately 50% of company revenue (approx. \$15M).
- Responsible for management of approximately 90 personnel within the Business Unit, making up 50% of company employees.
- Responsible for workforce planning, staffing, and customer negotiation for the portfolio.
- Responsible for revenue growth targets of 10% of revenue.
- Serve as Ignite’s senior scientist/engineer for IRAD, Proposals, and Company Representation.
- Led the development and establishment of Ignite’s product development, Ignite Labs. Ignite Labs has developed 4 software products in use at organizations ranging from the Army Aviation and Missiles Center to the Space Force Concepts and Technologies Delta (CTD).
- Led the development and establishment of Ignite’s Fellows Program to core up our non-managerial and technical experts allowing for better business development utilization and more quality proposal development.
- Lead of Ignite’s Internal Research and Development Program (IRAD) portfolio, developing and protecting Ignite’s first Intellectual Property (IP).
- Recovered a failing Space Force program, making up approximately 10% of company revenue. This team now is developing a the Space Force Operating Environment, approved by the Chief Space Officer.

Lead Scientist/Engineer and Futurist

Ignite Fueling Innovation, Huntsville, Alabama, 05/2023-04/2044

- Serve as Lead Scientist/Engineer on a direct congressional tasking through the United States Space Force (USSF) and elements of the Intelligence Community (IC) (Congressional tasking continues through 5/2024).
- Supporting the United States Space Force as a Strategic Missile Defense Expert and Futurist.
- Pioneered a methodology for assessing novel technology potentials for adversarial technological and strategic surprise utilizing technology readiness assessments and futures methodologies (Framework Foresight and the Manoa Methodology).
- Led the development of a 500+ page futures study for the USSF focused on China as the adversary. Topics included technology assessments, strategic and policy initiatives for both the US and China, and recommendations on Workforce Development. The report is to be delivered to Congress in the June timeframe.
- Developed data mining and analysis tools in Python to support Futures Scenario development.
- Providing technical expertise to a competitive futures analysis between the US and China to inform US Space policy and technology.

- Support the integration of a CONUS sensor gap analyses conducted by Federally Funded Research Centers (FFRDCs) and National Labs.
- Author a series of technical whitepapers baselining the current state and perceived benefits of new and emerging technologies including quantum radar, neutrino science, brain-computer interface, and metamaterials used for future capability development and science and technology investment at Space Force.
- Providing subject matter expertise to business development and proposal efforts including authoring technical volumes, answering government questions, and budget and schedule planning.
- Develop new technical capabilities leading to lines of business for the National Security and Space and Missiles business unit. Responsibilities include developing technical material, marketing material, and presentations.
- Present new and novel technologies, sensors, and reports to senior government leadership at the Senior Executive Staff and Congressional Staff level. I served as the lead technical representative in discussions with the Director of the Missile and Space Intelligence Center (MSIC) and the Principal Deputy Assistant Secretary of Defense for Mission Capabilities.
- Chief technical coordinator for a partnership with a multi-billion-dollar US company including assessing strategic advantages, capabilities, and business opportunities for the partnership.

Systems Engineering Manager – Advanced Programs (Next Generation Interceptor)

Lockheed Martin, Huntsville, Alabama, 11/2022– 05/2023

- Analyzed threat data to forecast threat capabilities in 2045 to identify NGI Black Design weaknesses and areas of incremental improvement.
- Identified potential technical test objectives and test article configurations for a proposed flight experiment in coordination with Next Generation Interceptor (NGI) Program Team.
- Worked with NGI program and IRAD teams to identify hardware availability, test requirements, and integration time to build a notional schedule and assess the feasibility of flight test experiment objectives.
- Presented notional test objectives and configuration at a cross business area working group to identify overlap and opportunities with other flight test experiments happening across the Lockheed Martin.
- Reviewed whitepaper proposals prepared for MDA as Pink Team and Red Team member for the LM HEAT organization. Topics included: window and seals, focal plane array, and dewar cooling assembly.

Kill Vehicle IPT Lead and Systems Engineering Manager (Glide Phase Interceptor)

Lockheed Martin, Huntsville, Alabama, 1/2022– 11/2022

- Responsible for technical and programmatic leadership for the development of the Glide Phase Interceptor (GPI) Kill Vehicle (KV).
- Manage a multidisciplinary and geographically dispersed technical team. Responsible for technical management, development, and motivation of employees.
- Responsible for the design, integration, and test of the KV and constituent components and subsystems including propulsion, seeker, avionics, and communications systems.
- Financial management of Kill Vehicle Work Breakdown Structure (WBS) including labor forecasting.
- Develop baseline qualification and acceptance test matrix derived from SMC-S-016 and engage with respective technical leads and suppliers to tailor the plans as appropriate.
- Led the integration of new KV and Upper-stage design baseline across the GPI in support of SRR-P (SRR-Prototype).
- Led a \$10M thrust-vector control (TVC) internal research and development (IRAD) effort to procure and integrate a new TVC into an existing first-stage rocket motor.
- Led the GPI manufacturing and logistics planning effort in support of Courtland facility site improvement action.
- Reconciliation and Baselining KV internal Technology Readiness Level (TRL) assessment with customer Technology Readiness Assessment (TRA) for the GPI Program.
- Developed integration plan for GPI KV and Upper-stage assemblies.
- Authored the Glidebreaker Phase II Proposal classified annex, detailing relevant KV and Divert and Attitude Control System (DACS) characteristics. Responsible for ensuring Demonstration system proposed maintained technical relevance to the GPI Operational System.

- Developed the Glide Phase Interceptor (GPI) Tech Maturation Plan and Test Plan for the program.

Manager (Missile Defense National Team)

The Boeing Company, Huntsville, Alabama, 11/2020– 1/2022

- Direction of a geographically dispersed staff of software engineers, network engineers, verification and test engineers, systems engineers, system architects/designers, and modeling and simulation analysts to include management, development and motivation of employees
- Facilitate technical coordination across the Missile Defense National Team (MDNT) IPTs and technical teams to position Boeing to be able to leverage the MDNT structure to meet customer needs.
- Work with the executive team to determine and implement programmatic/corporate technical and business strategies to facilitate MDNT growth and capture additional Boeing work share.
- Developed and implemented a Boeing Hiring Process within the constraints of the MDNT.
- Provide clear coordination of program level processes with the Boeing leadership and program customers.
- Develops and executes project and process plans, implements policies and procedures and sets operational goals
- Coordination with Boeing Business operations to ensure timely reviews and responses to RFPs and coordinating charge lines to align with Program directed work assignments
- Provide staffing leadership to include identifying talent and placing Boeing employees within a multi-company competitive environment, staffing resources to meet program staffing needs to include developing Boeing requisitions, reviewing candidates, interviewing and selecting the most qualified candidates
- Provide insight and recommendations to program leadership on technical and programmatic issues, including identifying areas for growth and helping to support long range business plans, staffing plans, and engineering review and approval of proposals
- Perform systems engineering of the existing MDS architecture in conjunction with new technologies and concepts for improvements to be considered for future Missile Defense System architectures
- Serving as a subject matter expert for systems engineering domains, system-specific issues, processes, and tools
- Establishment and Implementation of Technical Lead Engineer company initiative to the Boeing National Team structure.
- Provide staffing expertise to recommend and staff candidates throughout the Missile and Weapons Systems (MWS) Systems Engineering, Integration, and Test Capability.

Sr. Systems Engineer - Responsible Engineer (Missile Defense National Team)

The Boeing Company, Huntsville, Alabama, 01/2021– 01/2022

- Responsible Engineer responsible for Discrimination Test Content Tasking. Responsible for writing assessment objectives, and ensuring MDA Ground Test and Flight Test programs adequately satisfy Discrimination Program needs.
- Review of System-level specifications, subsystem specifications and warfighter need documentation to identify requirements gaps and orphans.
- Develop Initial Requirements Documentation (IRDs) to establish system level requirements in various areas including Electronic Attack, Electronic Protection, Discrimination and System Architecture.
- Develop use-cases, Concept of Operations (CONOPS), and Storyboards in support of IRDs.
- Provide Subject Matter Expertise to the Integrated Discrimination Team (IDT) Integrated Product Team (IPT) in the System-level test domain to ensure discrimination requirements are well defined and incorporated into the test and assessment baseline documentation such the Integrated Master Assessment Plan (IMAP) and Integrated Master Test Plan (IMTP). Ensured that these requirements were met in the Ground Test Campaigns and Flight Test Events.
- Responsible for technical coordination across the MDNT IPTs with an emphasis between the Integrated Discrimination (IDT) Team and the Integration, Verification, and Test (IVT).
- Serve as the Control Account Manager (CAM) for Integration, Verification, and Test (IVT) IPT to ensure horizontal integration between the finance and engineering departments of the program and ensure IVT remains within budget.

System of System Integrator (Missile Defense National Team)

The Boeing Company, Huntsville, Alabama, 07/2020– 01/2021

- Track, plan, and evaluate all continuous developmental integration (CDI) test events throughout the Global Missile Defense System.
- Evaluates element schedules and upgrade plans to identify disconnects, problem areas, or potential CDI opportunities.
- Author the Global Missile Defense System "System Integration Plan (SIP)" for the MDA chief Integrator tracking future integration of all systems in the Missile Defense Agency's portfolio (DAL).
- Author Integrated Design Exchanges (IDEs) to flesh out inconsistencies in subsystem level interface requirements to ensure continuity between MDS subsystems.
- Facilitate discussions between stakeholders on interfaces and messaging to ensure all stakeholders within the Agency understand the requirements and context of those requirements in the specification flow downs.
- Daily interaction with Customer and MDNT Leadership including written correspondence, weekly meetings, and providing briefings to leadership.
- Tracking all MDA systems integration action items and driving them to completion throughout all Directorates of the Missile Defense Agency.
- Evaluates element schedules and upgrade plans to identify disconnects, problem areas, or potential CDI opportunities.
- Facilitate discussions between stakeholders on interfaces and messaging to ensure all stakeholders within the Agency understand the requirements and context of those requirements in the specification flow downs.

Scenario Design Lead Engineer (Missile Defense National Team)

Boeing Company, Huntsville, Alabama, 09/2019– 07/2020

- Analyzing signals, creating threat capability forecasts, and using those forecasts to create scenarios to incorporate into ground test scenarios.
- Lead team of engineers to generate ground test scenarios to test MDA BMDS System.
- Track requirements from all Ballistic Missile Defense System components and ensure integration into Scenario Designs for Ground Tests.
- Evaluate all proposed scenarios for feasibility and provide alternative scenarios for unfeasible proposals.
- Optimization of scenarios to maximize requirement density in the test campaign.
- Work with other cross-industry teams to determine the intent of requirements flowed to the Army Futures Command for Ground Test Scenario generation to ensure that the scenario designs meet the requirements and the overarching assessment intent.
- Team coordination with other MDNT teams, the Missile Defense Agency (MDA), and the Army Futures Command.
- Produce Weekly and Monthly deliverables to MDNT and MDA Customer
- Provided collaboration and reach-back within the MDNT to ensure threat availability and requirement context was understood in the lab.
- Briefed Designs to Customer and MDNT Leadership

Sr. Aerospace and Systems Engineer (Missile Defense National Team)

The Boeing Company, Huntsville, Alabama, 01/2019– 09/2019

- Work with the Army Futures Command to design ground test scenarios for testing the global architecture of the ballistic missile defense system (BMDS).
- Evaluate intelligence reports to help ensure the MDA systems operationally and developmentally meet the threats developed all over the globe.
- Develop Test Scenarios to test all components of the MDA BMDS system through multiple test events including GTI-08a, GTI-
- Evaluate all proposed scenarios for feasibility and provide alternative scenarios for unfeasible proposals.

Lead Aerospace and Propulsion Engineer

Archarithms, Inc, Huntsville, Alabama, 02/2016– 01/2019

- Support Archarithms' SBIR proposal writing effort. I participated in proposal efforts for the Navy, Air Force, and Missile Defense Agency by technical writing and engineering design. I authored approximately 5 proposals and supported the development of many others.
- Respond to RFI and RFP request for major government agencies. I worked as a customer interface to compete and win a \$750k contract with the Army Materiel Command in Ft. Bragg.
- Developed artifacts for responses to customer solicitations.
- Provide Archarithms Inc. with unique solutions to problems in the field of Aerospace Propulsion and related fields as the Aerospace Engineering Lead.
- Directly support the bidding for major Army and MDA contracts by providing documentation and verification of concepts for systems testing.
- Provide integrated solutions across the four core competencies of Archarithms, Inc: Kill Vehicle Technology, System of System Integration, Command and Control, and Artificial Intelligence to market to government agencies and industry customers.
- Successfully add propulsion to Archarithms long-term vision and planning at the corporate level.
- Work with AI professionals to evaluate signals and new capabilities of Neural Networks and forecasted use cases for the military to inform internal research and development.

DACSM Design, Integration, and Test Lead (Redesigned Kill Vehicle)

Missile Defense Agency (Archarithms), Huntsville, Alabama, 02/2016– 01/2019

- Lead Propulsion Design, Integration, and Test Engineer for the Missile Defense Agency's Redesigned Kill Vehicle (RKV).
- Managed the Redesigned Kill Vehicle Center Manifold Structure Hot Fire Test at the White Sands Test Facility. The test spanned 2.5 months and hundreds of hot-fire pulses in single engine, dual engine, minimum impulse bit, and mission duty cycle testing. The test incorporated more than 30 personnel from NASA, MDA, Boeing, Raytheon, and Aerojet Rocketdyne.
- Manage the efforts of the RKV contractors (Boeing, Raytheon, and Aerojet Rocketdyne) as through design, integrate, and test efforts for the Divert Attitude Control System Module (DACSM).
- Analyzed test data to ensure the DACSM performed nominally and did not experience combustion instability.
- Review technical and administrative engineering documents and drawings for feasibility and good engineering practice including requirements documents, test plans, and analysis documents.
- Lead team through major milestones including the RKV System Requirements Review, Preliminary Design Review, and Critical Design Review Objective Evidence Review.
- Support Tech Eval efforts on a major DOD proposal, >\$1B, by analyzing Work Breakdown Structures (WBS), and Basis of Estimates (BOE). I was the focal for the propulsion and structures WBSs.
- Manage budgets and costs of MDA DACSM testing efforts to ensure range and subcontractor funding is current.
- Serve as independent Propulsion SME to review MDA externally funded research in hypergolic propellant development and combustion instability.
- Review CDRL deliveries for content and structure and provide an Accept/Reject rationale to the Missile Defense Agency.

Lead Engineer

Independent Contractor, Huntsville, AL, 01/2016 –10/2016

- Decompose customer requirements to design a reusable veterinary dart for medicating livestock.
- Served as a consultant in developing appropriate slow burning grains to decrease the pressure hammer effect that often cracked the dart body and liaison to production facilities to ensure the cost effectiveness and competitiveness of the project.

Mechanical Engineer

Optical Sciences Corporation, Huntsville, AL, 08/2013 –02/2016

- Designed Test Equipment and brackets for Hardware in the Loop (HWIL) testing for the U.S. Army (AMRDEC) using AutoCAD Inventor and Solidworks and fabricated designs using light machining techniques.
- Designed and integrated various facilities ranging from the floor plan level to the individual component design level.

- Facilities include the TTEC, RKV, and Advanced Sensors HWIL Laboratories for both AMRDEC and MDA.
- Led STTR and SBIR proposal effort for aerospace and propulsion systems.
 - Created models of the moment of impact of destructive flight tests based on telemetry data, trajectory analysis, and destruction pattern of target in support for the NAVY.
 - Directly supported the bidding for major army and MDA contracts by providing documentation and verification of concepts for systems testing.
 - Led effort to introduce additive manufacturing into the HWIL laboratories by designing and printing custom covers, brackets, and structures.
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ACADEMIC EXPERIENCE

UNIVERSITY OF ALABAMA IN HUNTSVILLE

Adjunct Instructor – Electrical and Computer Engineering Department (2019 Appointment)

Classroom Instruction Includes:

ENG 101 – Introduction to Engineering (undergraduate)

HON 301 – Systems Thinking (undergraduate)

HON 301 – Strategic Foresight and Future Studies (undergraduate)

MAE-311 – Introduction to Computational Tools (undergraduate)

ISE 627 – Introduction to Systems Engineering (graduate)

CERTIFICATIONS

Project Management Professional (PMP) – Project Management Institute (PMI)

Professional in Business Analysis (PBA) – Project Management Institute (PMI)

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Tool for High-Level Analysis of Literature and Exploratory Search (THALES) v8.0, January 31, 2025. Held by Ignite Fueling Innovation, Inc.

PUBLICATIONS

- Grumbach, Joshua L and L. Dale Thomas “Integration Principles for Complex Systems”, INCOSE Systems Engineering – 9/28/20
- Grumbach, Joshua L and L. Dale Thomas “Systems Integration Implications of Component Reuse”, INCOSE Systems Engineering – 7/18/22
- Grumbach, Joshua L and L. Dale Thomas “Quantitative Validation of Complex Systems Integration Principles”, INCOSE Systems Engineering – 9/20/22
- Grumbach, Joshua L “Adapting a Strategic Foresight Framework to Reuse Integration”, INCOSE Systems Engineering – 3/16/2023
- Grumbach, Logan “Read Before Flight”, 8/2023