HUNTSVILLE
Society of Reliability Engineers

Women in Engineering Panel

U.S. Space and Rocket Center's Education Training Facility

Huntsville, AL – November 7, 2024

Introductions

- Lisa Bates, Data Strategy Sub Task Lead at Charles Stark Draper Laboratory
- Carelyn Martinez, RAM Engineer at DEVCOM AvMC
- Michele Platt, Founder and CEO of AVNIK Defense Solutions, Inc.
- Dr. Ana Wooley, Assistant Professor within the Department of Industrial Systems Engineering and Engineering Management (ISEEM) at The University of Alabama in Huntsville

DRAPER®

Women in Engineering

Panelist: Lisa Bates

Authors: Lisa Bates

November 5, 2024

The Charles Stark Draper Laboratory, Inc.
555 Technology Square, Cambridge Mass. 02139-3563
CAGE Code: 51993

Introduction

- Current Role:
  - Lisa Bates is a Distinguished Solutions Architect with Charles Stark Draper Laboratories. Currently working in Digital Engineering for a classified Program as the Data Strategy sub task lead
    - Leading the development of the Digital Engineering Ecosystem infrastructure development pipeline for a classified program
- Years of Experience
  - 17 years of DoD experience
- Previous Roles
  - Lisa has worked as several different roles in Product Life Cycle engineering involving proposals, capture, logistics, RAM, digital sustainment, data analytics, research, and equipment health monitoring
- Education
  - Raytheon Certified AIML Practitioner training, Raytheon Certified Architect, TOGAF 9 certified, Mississippi State University, Some PhD level courses in Computational Engineering, 2019, University of Alabama in Huntsville, MS in Operations Research, 2014, University of North Alabama 2014, BS in Physics 2008, Northeast Mississippi Community College, Associates of Mathematics 1990

Career Journey

- Associates Degree in 1990, 3 kids by 1993
- Started my own business in 1994 – 2017 off and on Jingles the clown & Friends
- Bachelors in Physics while working an average of 48 hours a week, 3 teenagers, homeschooling in 2008
- DoD contractor Journey - Multiple progressive roles
  - Cost Account Managing, Functional & Technical Lead Roles
  - Continuous learning of in-Demand innovative skillsets
  - Promotions on average every 2 ish years
- Work-life re-balance in 2023
- Major Achievements
  - Undergrad research led to University of North Alabama Sigma Pi Sigma award for contributions to the science of Physics 2010 and several conference papers and awards.
  - Multiple Innovation and Designated Strategic Information Awards
  - Dependability committee Chair for the ECIA (Electronic Components Industry Association) an SDO (Standards Developing Organization)
  - RAMS management committee or moderator for several years
  - Several Featured Engineer awards at work and as an Alumni of UAH

Current Role and Projects

- Distinguished Solutions Architect with Charles Stark Draper Laboratories. Currently working Digital Engineering for a classified Program as the Data Strategy sub task lead
  - Leading the development of the Digital Engineering Ecosystem infrastructure development pipeline for a classified program
  - Liaison with the Digital Engineering IRAD for my program
  - Using my RAM training in innovative ways to connect the data form multiple groups together

Strong ties between requirements, software, systems can all be made using the natural FMECA or Fault Tree hierarchy of a system and its' data

Challenges and Opportunities for Women in Engineering

Challenges

- Underrepresentation
- Culture
- Work-Life Balance
- Unconscious Gender Bias
- Unclear Promotion Paths
- Lack of Confidence
- Poor Communication

Opportunities

- Diverse Perspectives
- Supportive Networks
- Flexible work
- Growing Awareness
- Mentorship or Sponsorship
- Online Leadership/Technical Training

Mentorship and Support

- Understand you need both mentorship and sponsorship
- My best sponsors/ mentors have been mostly men
- Participate in work mentorship programs if it works for you.
  - Don’t be afraid to not participate if it doesn’t work for you but conversely find yourself a mentor / sponsor
- Understand yourself so you can help others understand you better
  - Take the online personality tests
  - Role playing with people close to you about work situations / communication style
  - Listen but don’t necessarily take other opinions to heart
  - Don’t let other people limit your potential in word, thought or deed.

Work-Life Balance

- Demand flexible work arrangements
- Build your network through relationships
  - Barter/ Swap childcare, elder care
  - Get the help you need at home whether that be a bi-weekly cleaning service, kids chores, meal prep, meal delivery
- Find something to do outside of sitting in the office chair working
  - Something you will do and you like
- Build a working plan but be flexible to iteration
- Practice Good Boundaries

Future of Engineering

- AI Integration into workflows reducing labor intensive tasks and facilitating the breakdown of communication silos between engineering groups working the same project:
  - Example – Diagnostics is built from a Failure Modes & Effect Criticality Analysis (FMECA) early in the design. Then real time changes affect the Bill of Materials. DD254 – As Built doesn't match early design so diagnostics has to be re-worked. AI
- More Software Centric skills needed, more cross functional skills
  - Artificial Intelligence/ Machine Learning, systems engineering and Reliability engineering combined skillsets are emerging with Degrees to match like Computational Engineering
- Better Graph Data Visualization for enabling ties from requirements to supply chain to field reliability issues

Q & A

- Linkedin Mary "Lisa" Williams Bates | LinkedIn
- Email: lbates@draper.com

Carelyn Martinez

Stockpile Reliability Program (SRP)

Engineer

RAM Engr & SA Division

SRD/AvMC

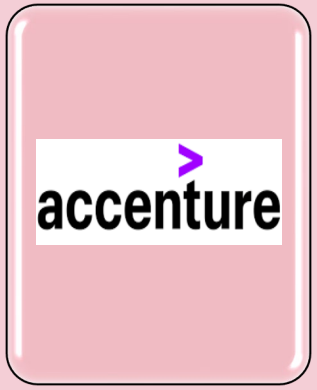
Professional Background/Expertise: Expert managing the HELLFIRE SRP, an Army-Wide program that supports Army readiness by monitoring the safety, reliability and performance of the HELLFIRE missile systems as they age to ensure they achieve their maximum useful shelf life.

Career Journey

2007

BS in Industrial Engineering

University of Puerto Rico Mayaguez



2007

Consulting Analyst, SAP Capability Group

Accenture, El Segundo, CA

2009

General Engineer

DEVCOM AvMC (former AMRDEC), Redstone Arsenal, AL.

2009-2014

Quality Engineer

Mainly supporting PM Aviation – Apache

2014-2015

Executive Office to the Director of Engineering Directorate

2015 – Present

Reliability/ SRP Engineering

PM Missiles and Space – TAGM

2021

MS in System Engineering Management

Naval Postgraduate School Monterrey

Career Journey, cont.

Challenges/Overcomes:

- ✓ Relocation: Engaging socially and professionally with peers, staying connected with family
- ✓ English not first language: Practicing and continuing to speak up, reading widely, embracing mistakes. ***Do not be ashamed of your accent!***
- ✓ Male-dominated field: Deepening my knowledge, found mentors, communicating assertively and staying resilient.

Achievements/Milestones:

- ✓ *Master's degree – Systems Engineering Management, Naval Postgraduate School*
- ✓ *15 years civilian service*
- ✓ *Leadership roles*

Current Role and Project

Current Role:

- ✓ **Lead SRP Engineer for HELLFIRE missile systems**: An Army program that continually measures stockpile reliability providing data to ensure that ammunition and ammunition components are available for issue/use and are safe/reliable.

Current Project:

- ✓ **Missile Reliability Data (MRD) Manifold** (a.k.a. LUCI): an AI tool to transform unstructured visual inspection data into structured failure/defect code and analyzable information.

Challenges and Opportunities for Women in Engineering

Challenges:

- ✓ Underrepresentation (lack of role models and mentors), ***however, I think this is improving!***
- ✓ Workplace culture

Opportunities:

- ✓ Cultural shifts
- ✓ Diverse perspective
- ✓ Growing initiatives for inclusion

Mentorship and Support

- Mentorship is very important for career advancement and professional/personal growth. ***Find yourself a mentor!***
- When you find your mentor, set clear goals, have open communication and accept all the feedback and critical criticism.
- ***I recommend a mentor that represents you and that you look up to!***

Work-Life Balance

- Balancing professional responsibilities with personal and family life can be very challenging!
- Advocate for flexible work arrangements
- Clearly understand our benefits. Familiarize yourself with the policies on maternity leave, parental leave, and family support services.
- Establish boundaries and prioritize self-care

Future of Engineering

- Artificial Intelligence - data-driven decision-making and innovative problem-solving
- Model Based Systems Engineering (MBSE)

Q&A

Contact:

Carelyn E. Martinez

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AVNIK
DEFENSE SOLUTIONS, INC.

Michele Platt – Founder, President, and CEO of AVNIK Defense Solutions

- Originally from Detroit, MI
- Engineering career
- Founded AVNIK in 2006

- **Overview of their career path including key roles and transitions.**
  - College Path: Hotel Restaurant Management to Nutrition to Engineering to MBA
  - Lockheed Martin (1984-1994)
    - Gyro Engineer on Apache
    - Foreign Military Sales Program Manager for Apache sight system (TADS/PNVS)
  - Apache Program Management Office (1994-2015)
    - Developed, Tested, and Fielded 1st generation Flight Data Recorder
    - Designed and implemented Apache Condition Based Maintenance (CBM) program

- **AVNIK full time (2015-Present)**
  - Challenges faced and how the challenge was overcome
  - Getting that 1st contract
    - Develop Relationships
    - Identify Customer Needs
    - Hiring Quality Personnel – IS KEY!
  - Try lots of different paths – Its just as important to learn what you don't want to do
  - Find your niche
  - Ask for help

- **Major achievements and milestones**
  - Started AVNIK 2006
  - First contract for other employees – Growing AVNIK
  - Opened a real brick and mortar office called "AVNIK"
  - Facility Clearance
  - DCMA Approved Accounting System
  - First SBIR for Army – Familiar customer
  - First SBIR for Navy – Whole new customer

- **Chief Executive Officer / SBIR Principal Investigator**
  - NAVAIR N182-100 - Software Automated Analysis Toolset System (SAATS)
  - NAVAIR N192-065 - Concurrent Engineering Layered Logistics Structure (CELLS)
  - Army A21.C-T013 - intelligent Frequency Modulated Continuous Wave (iFMCW)

- **AVNIK projects ranging from:**
  - Sustainment supporting AMCOM and PEOAVN
  - Engineering supporting PEO Aviation, PEO Missiles & Space, and Systems Readiness Directorate (SRD)
  - R&D supporting Army Small Business Technology Transfer (STTR) and Navy Small Business Innovative Research (SBIR) Projects

- **Community Projects Bring our Team Together**
  - Madison CEO supporting young professionals
  - Liz Hurley Breast Cancer Golf Tournament
  - Liz Hurley Ribbon Run
  - American Heart Association Heart Walk
  - Huntsville Energy

Challenges:

- Glass Ceiling? - Find the crack
- Wet Noodle? - Don’t push it (it will never move)

Opportunities:

- Focus on your desired end state
- Eliminate distractors – don’t listen to “naysayer”
- Create your own destiny
  - Identify opportunities
  - Become an expert
- Tell the truth - you’ll gain trust
- Make mistakes - take responsibility and fix it – *Learn The Lesson*
  - *The consequences get higher the next time*
- Learn from every experience

- You must be receptive to advice from a mentor
  - When it happens you'll know it
  - Take time to listen – you have **two ears** and **one mouth** for a reason
  - Surround yourself with encouraging people
- Give mentorship without reservation
  - Remember where you came from
- Don't know you can't
- Set goals with one foot in front of the other

- Learn to say no
- Start with taking care of yourself
  - you can't help anyone else if you're sick
  - Healthy habits and exercise (look who's in the gym at 0500?)
- Plan your day and execute your plan
  - Interruptions will happen – embrace change

Seven Habits of Highly Effective People

First 3 habits move us from **dependence to independence** (i.e., self-mastery):

1 - Be proactive - Take responsibility for your reaction to your experiences, take the initiate to respond positively and improve the situation.

2 - Begin with the end in mind - Envision what you want in the future so you can work and plan towards it.

3 - Put first things first

I - ***Urgent and important*** **(Do)** – important deadlines and crises	**III -** ***Urgent but not important*** **(Delegate)** – distractions with deadlines
II -***Not urgent but important*** **(Plan)** – long-term development	IV - ***Not urgent and not important*** **(Eliminate)**

https://en.m.wikipedia.org/wiki/The_7_Habits_of_Highly_Effective_People?wprov=sfti1

Seven Habits of Highly Effective People

The next 3 habits talk about **Interdependence** (e.g., working with others):

4 - Think win-win - Genuine feelings for mutually beneficial solutions or agreements in your relationships.

5 - Seek first to understand, then to be understood - Use **empathetic** listening to genuinely **understand** a person, which compels them to reciprocate the listening and take an open mind to being influenced by you.

6 - Synergize! - Combine the strengths of people through positive teamwork, so as to achieve goals that no one could have done alone.

Seven Habits of Highly Effective People

The 7th habit is continuous improvement – both personally and interpersonally

7 - Sharpen the Saw - Growth

- Balance and renew your resources, energy, and health to create a sustainable, long-term, effective lifestyle.
- Exercise for physical renewal
- Good prayer (meditation, yoga, etc.)
- Good reading for mental renewal
- Service to society for spiritual renewal

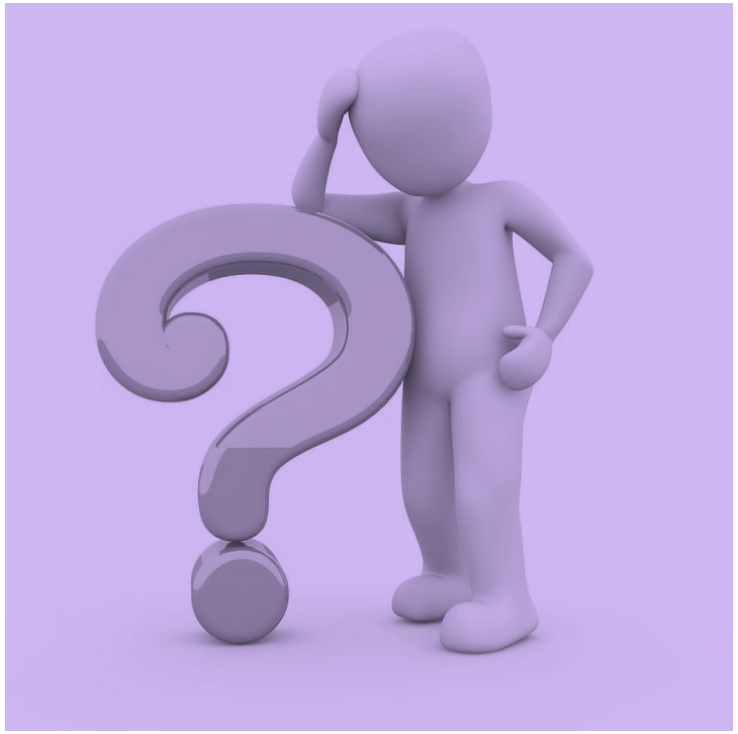
Emphasis on innovation

Automation of repetitive tasks

Novel new ideas – Organizations are using SBIR Funding:
$2.3B - DoD – Defense
$1.2B - Health and Human Services (HHS)
$ 315M - DOE – Energy
$ 174M - NASA – Space
$ 215M - National Science Foundation (NSF)
$ 42M - Department of Agriculture (USDA)
$ 18M - Department of Homeland Security (DHS)
$ 15M - Department of Commerce (DOC)
$ 10M - Department of Education (ED)
$ 9M - Department of Transportation (DOT)
$ 5M - Environmental Protection Agency (EPA)

https://www.sbir.gov/participating-agencies

QUESTIONS?



Contact Information for follow up questions:

LinkedIn is Best!
https://www.linkedin.com/in/michele-kochoff-platt/

Text: 256.682.6261

THE UNIVERSITY OF
ALABAMA IN HUNTSVILLE

Women in Engineering

Ana Wooley, Ph.D., Assistant Professor, ISEEM Department

ABOUT ME

Ana **Wooley**, Assistant Professor,
Industrial and Systems Engineering
and Engineering Management (ISEEM)

THE UNIVERSITY OF
ALABAMA IN HUNTSVILLE

DIGITAL MANUFACTURING

MANUFACTURING
- Advanced Manufacturing
- Lean Manufacturing
- Smart Manufacturing
- Industry 4.0

MODELING
- Simulation
- Modeling Systems

DIGITAL TECHNOLOGIES
- Digital Thread
- Digital Twin
- Digital Transformation
- Digital Engineering

CARRER JOURNEY

Challenges + Achievements

THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

2012
Started B.S. INSY
Universidade Federal de Itajuba/Brazil

2014
1.5 years B.S INSY
Auburn University

2017
Process Improvement Intern
São Paulo/Brazil

2018
Earned B.S. in INSY

2019
Started M.S. and Ph.D. INSY
Auburn University

2019
Graduate Fellowship

2020
Earned M.S.

2021
Graduate Certificate of Automotive Manufacturing Systems

2023
Ph.D.

CURRENT ROLE AND PROJECTS

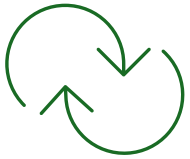
Conceptualization

- Help clarify what is DT and how it differs from other technologies, such as simulation

Manufacturing

- Help Small and Medium Enterprise (SME's) to adopt Digital Twin technology
  - Provide guidelines to determining if DT is a good solution to their problem
  - How to leverage existing technologies and transform it to DT's
  - DT Tool Box

Life Cycle



- Investigate how DT behaves in the different phases of a product life cycle
- Explore how the DT model can transition in the life cycle stages

CHALLENGES AND OPPORTUNITIES FOR WOMEN IN ENGINEERING

Challenges

- Gender biases and stereotypes in engineering fields.
- Balancing career progression with personal and family life.
- Limited access to leadership roles.

Opportunities

•Increasing focus on diversity and inclusion in STEM.

•Growth in mentorship programs and networking opportunities.

•The potential for women to lead transformative change in engineering.

MENTORSHIP AND SUPPORT

- Importance of Mentorship
- Confidence building, career guidance, navigating workplace dynamics.
- Support Systems

- Society of Women in Engineering (Advisor)

swe™
Society of Women Engineers

WORK-LIFE BALANCE

Setting Boundaries

Time Management

Flexible Hours

Academia Job

You are never “off”

FUTURE OF ENGINEERING

1	2	3
• Role of Women in Engineering	• Encourage more women to take up leadership roles in innovative engineering fields.	• Diversity is important for fostering creativity and innovation in engineering.

THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

QUESTIONS?

Ana Wooley, Ph.D., Assistant Professor, ISEEM Department

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Panel Discussion

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- Can you tell us about your journey into engineering and what inspired you to choose this career path?
- What are some of the biggest challenges you face as a woman in engineering and how did you overcome them?
- How can we encourage more young women to pursue engineering degrees and STEM fields in general?
- What are some strategies or policies that companies can implement to support gender diversity in engineering?
- What advice do you have for women seeking leadership roles in the engineering field?
- How important is mental health and well-being in your professional life and what steps do you take to maintain it?
- What are the biggest opportunities for women in engineering as we move into a more technology-driven industries (e.g., AI, digital engineering, etc.)?
- What advice would you give to women who may doubt their abilities in male-dominated spaces?
- What is the best advice that you received that helped you grow in your engineering career?
- What legacy do you hope to leave behind for future women in engineering?

Q&A with Audience

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Closing Remarks

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