



Building Meaningful Partnerships and Collaborations with the Air Force



Tactical Autonomy - University Affiliated Research Center TA - UARC

8 Jun 2023

D. Tim Williams – UARC Program Manager
CMSgt Crystal Bridges – Outreach Coordinator



Consortium Membership



Howard University
Delaware State
Bowie State
Hampton University
Norfolk State
Florida Memorial College
Jackson State
Tougaloo
Tuskegee

} 12-16 Jun



Government Support



■ DAF Sponsor – Dr. Victoria Coleman

- Mr. D. Tim Williams, SAF/CDM
- Ms. Asheley Blackford, AFRL
- CMSgt Crystal Bridges - USAFR
- CDR Art Mosley - USNR

■ Executive Leadership / Steering Committee

- Dr. Deitra **Trent**, WHI-HBCUs
- Mr. Maynard **Holliday**, OUSD(R&E)
- Ms. Marianne **Malizia**, SAF/DI
- Mr. Farook **Mitha**, OUSD(A&S)
- Dr. Jagadeesh **Pamulapati**, OUSD(R&E)
- Dr. Kimberly **Sablon**, OUSD(R&E)
- Ms. Tawanda **Rooney**, SAF/CDM
- BrigGen Christopher **Walker**, SAF/DI

Advisors

Ms. Valerie Hall, Director FFRDC & UARC, USD(R&E)

Ms. Evelyn Kent, Director HBCU/MI Program & Outreach

■ SAF/PA – Ms. Ann Stefanek

- Ms. Laura McAndrews

■ SAF/AQ (PEM) – Bradrick Oeth (AQRE)

■ AFRL IPT; Executive Advisor Mr. Timothy Sakulich, Dr. Marcus Smith

- **DP**
 - ♦ Mr. Brian Stevens
 - ♦ Ms. Brooke Belickis
- **FM - Mr. Rodney Izor**
 - ♦ Ms. Rebekah Buck
- **JA - Ms. Sabra Tomb**
 - ♦ Mr. Jonathan Compton
- **PA – Mr. Bryan Ripple**
- **PK – Adam Wentworth** (Noreen Bennett)
- **SB - Ms. Paula Lemke**
- **Sensors(RY) – Dr. Juan Vasquez** (RYZA)

■ Additional Advisors –

- Dr. Steven Rogers – (AFRL/ACT3)
- Dr. Cindy Achat-Mendes USD(R&E)
- Dr. Shannon Arnold USD(R&E)
- Mr. David Busigo, USD(A&S)



Requirements: Technical



Definition:

- Tactical Autonomy is defined as autonomous systems acting with **delegated and bounded authority** of humans in support of tactical, short-term actions associated with a longer-term strategic vision.



Requirements: Technical



Trust in Mission Autonomy

- Systems will behave as expected when exposure to the operators or “users” results in behavior expectations (a mental model of what the system will do) and users are willing to be vulnerable to the actions taken by the autonomous solution.

Collaboration Between Platforms

- Study interaction between various autonomous agents to determine feasibility. To achieve mosaic warfare requires disaggregation / distribution across manned and unmanned platforms. The composition of legacy solutions with new systems/platforms can create an adaptive kill web but should not be overly costly to develop.

Human-Machine Teaming

- Hybrid teaming where individuals have different roles. Roles need to be flexible – subordinate, peer, and supervising/tasking.
- Identify levels of acceptance, failure, etc., for approval. Describe and develop assessments to define levels of success.



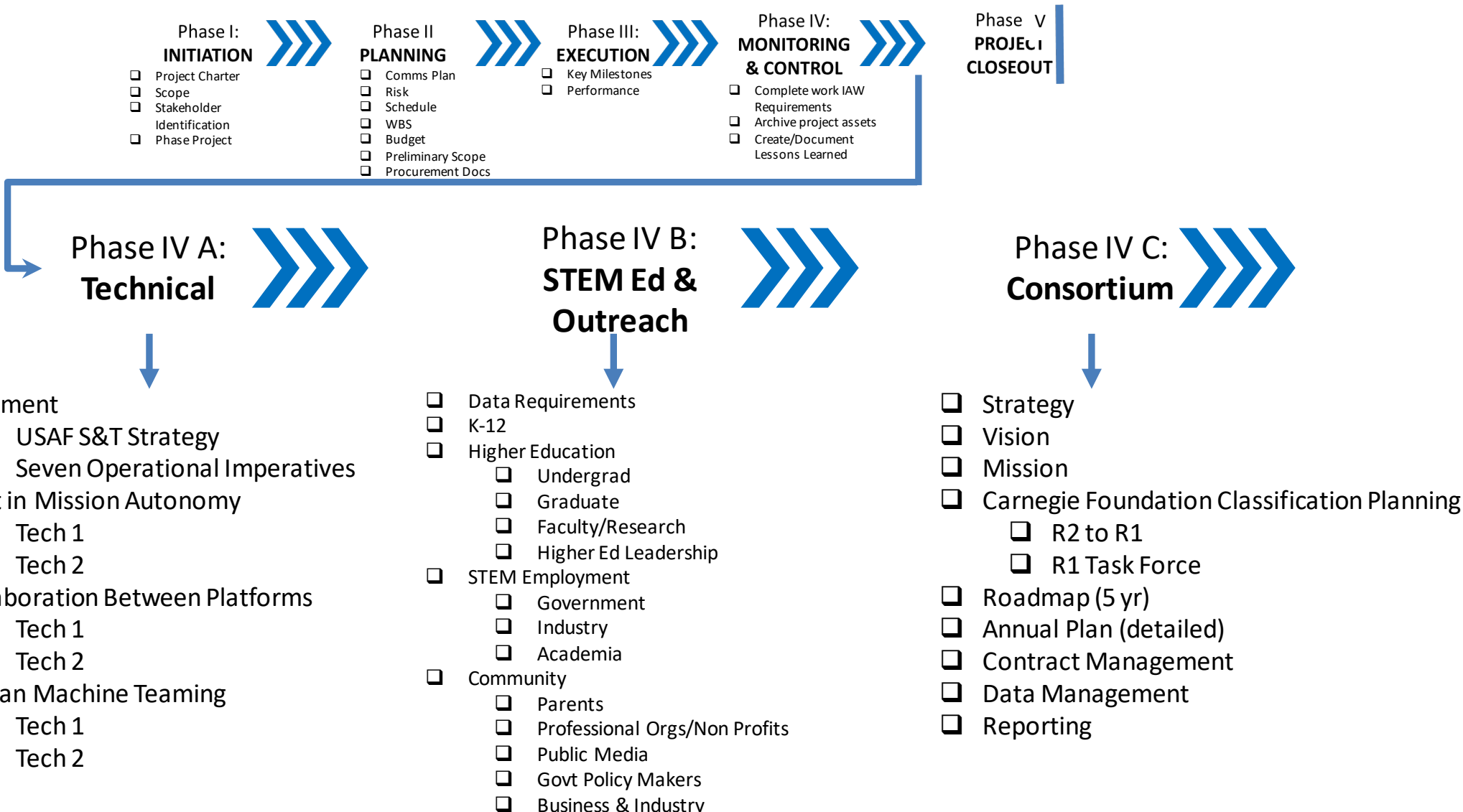
TA UARC



| Strategic Goals | | | |
|--------------------------------|-----------------------------------|--------------------|--|
| <i>Goals</i> | <i>HAF/SAF OPR(s)</i> | <i>Due Date(s)</i> | |
| TA Technology Research | Dr. Juan Vasquez / CDR Art Mosley | Jun 2023 | |
| STEM Ed & Outreach | CM Sgt Crystal Bridges | Jun 2023 | |
| Build Consortium of HBCUs | Mr. Tim Williams | Mar 2023 | |
| Operational Objectives | | | |
| <i>Objectives/Initiatives</i> | <i>OPR(s)</i> | <i>Due Date(s)</i> | |
| Tech Research | UARC | FY24 Q2 | |
| STEM Ed Operational Plan | UARC | FY23 Q3 | |
| Barriers (Risks) | Govt | FY23 Q3 | |
| Career Development | UARC | FY24 Q3-Q4 | |
| R2 to R1 Status | Consortium | FY28 | |
| Strategic Outreach | Govt | FY23 Q4 | |
| Implementation Plans | | | |
| <i>Action(s) Assigned</i> | <i># AF OPR(s)</i> | <i>Due Date(s)</i> | |
| IMS | M.s. A. Blackford | | |
| Data Management | CDR Art Mosley | | |
| Education & Outreach Metrics | Chief C. Bridges | | |
| <u>Community CyberSecurity</u> | CDR A. Mosley | | |



Enabling the DAF Autonomy UARC





Milestones




Project Kickoff
1 Feb 2023

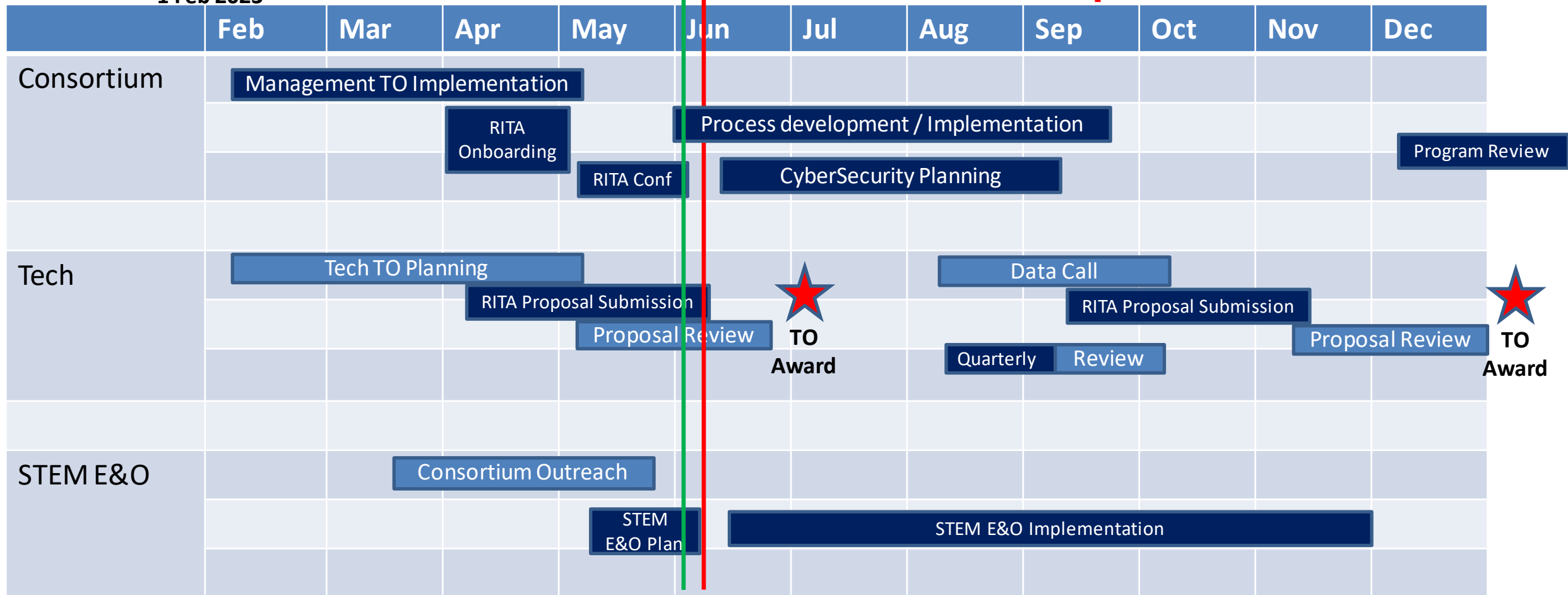
Today

Summer Break


BoA Review

RITA

DAF





TA UARC Goals, Actions, & Accomplishments



| FOCUS AREA | DESIRED OUTCOMES | ONGOING ACTIONS | ACCOMPLISHMENTS |
|----------------------------|--|---|---|
| Tech Req | <ul style="list-style-type: none"> ▪ Develop techniques / technologies <ul style="list-style-type: none"> ▪ Trust in mission autonomy ▪ Collaboration between platforms ▪ Human/Machine teaming ▪ Enhance Real-time SA & Autonomous Decision Making ▪ Est/Leverage AI infrastructure ▪ Industrial Security Compliance ▪ Annual TO delivery ▪ Data repository initiation ▪ Continuous interaction between TPOC/PIs ▪ Grad/Undergrad participation | <ul style="list-style-type: none"> ▪ TIM planning ▪ University proposal dev ▪ RITA proposal submission ▪ Tech TO development ▪ Proposal Review ▪ Contract Negotiation ▪ TO delivery | <ul style="list-style-type: none"> ▪ Data Call Complete (15) ▪ Tech Req distro to PIs ▪ Intranet (collab) est. ▪ Public Q&A ▪ Finalizing contract req ▪ HU Consolidating Tech submissions ▪ JHU-APL AI-CCA Workshop (Scenario Development) |
| STEM Ed & Train | <ul style="list-style-type: none"> ▪ Attract/train cadre of diverse researchers to enhance STEM pipeline <ul style="list-style-type: none"> ▪ Build STEM Autonomy pipeline ▪ Create Curriculum for Autonomy ▪ Support equitable access ▪ Promote widespread education and understanding of autonomy principles ▪ Fully integrated and standardized K-12, post-secondary, and faculty ed. ▪ Standardized POI (Curricula) | <ul style="list-style-type: none"> ▪ STEM Ed metrics (data collection) & STEM Evaluation Plan ▪ STEM Ed in DAF training ▪ Core competencies, curricula, and learning objectives ▪ Develop webinars, information sessions, summer workshops, and video tutorials | <ul style="list-style-type: none"> ▪ NASEM STEM E&O Metrics ▪ Identification of future req: <ul style="list-style-type: none"> ▪ K-12 ▪ Post Secondary ▪ PhD ▪ Faculty ▪ Shared DoD Plan ▪ Shared DAF Plan |



TA UARC Goals, Actions, & Accomplishments



| FOCUS AREA | DESIRED OUTCOMES | ONGOING ACTIONS | ACCOMPLISHMENTS |
|---------------------------------|--|--|--|
| Strat Eng & Outreach | <ul style="list-style-type: none"> ▪ Increase exposure to DAF employment, research, fellowship, internship, and contract opportunities ▪ Market DAF as a model employer ▪ Broaden DAF reach and access ▪ Maintain partnerships w/ organizations with STEM equities ▪ Participate in school/job fairs to increase awareness of the DAF | <ul style="list-style-type: none"> ▪ Consortium member visits ▪ Collaboration w/external partners ▪ USD(R&E) advisory group ▪ DMOC engagement ▪ DAFBAWG engagement ▪ Social media development ▪ Develop POAM for FY25 POM resources ▪ Dev unified strategic msging ▪ Leadership exposure, support, and engagement | <ul style="list-style-type: none"> ▪ Norfolk, Hampton, Bowie, Delaware State visits ▪ Engagement opportunities: <ul style="list-style-type: none"> ▪ NSPAA ▪ Digital Literacy Summit ▪ TCRDF ▪ USD(R&E) AI Workshop ▪ Enabling organizations ▪ Finalized “Southern Tour” |
| Consortium | <ul style="list-style-type: none"> ▪ Quantitative/Qualitative data collection to Increase research classification from R2 to R1 ▪ Build UARC-wide spirit of inclusive research collaboration ▪ Coordinated data governance / management across consortium to support objective assessments ▪ Expand consortium ecosystem | <ul style="list-style-type: none"> ▪ Evaluate peer-reviewed research ▪ Collect the # of BS, MS, PhD graduations ▪ Evaluate tech transition efforts ▪ Identify potential consortium members ▪ Catalyze new ideas / meritorious initiatives across consortium ▪ Solicit, enable, and foster innovative collaborative projects ▪ Grow business and government investment | <ul style="list-style-type: none"> ▪ IDIQ development/Release <ul style="list-style-type: none"> ▪ TO1 (Management) release ▪ TO2 (Tech) development ▪ Strategic outreach to Consortium Membership ▪ Consortium Conference ▪ AAR w/DAF ▪ Functional Battle Rhythms |



TA UARC Goals, Actions, & Accomplishments



FOCUS AREA

DESIRED OUTCOMES

ONGOING ACTIONS

ACCOMPLISHMENTS

Info Tech (IT)

- Clearly articulated, understood, and planned Technology Roadmap
 - Security/tools/backend
 - ROI-costs
 - Support requirements
 - Consortium distribution (current / future)
- Network availability
 - On-prem
 - Remote
- Network acceptability
 - Government
 - Academia
 - DIB/Industry/Small Business

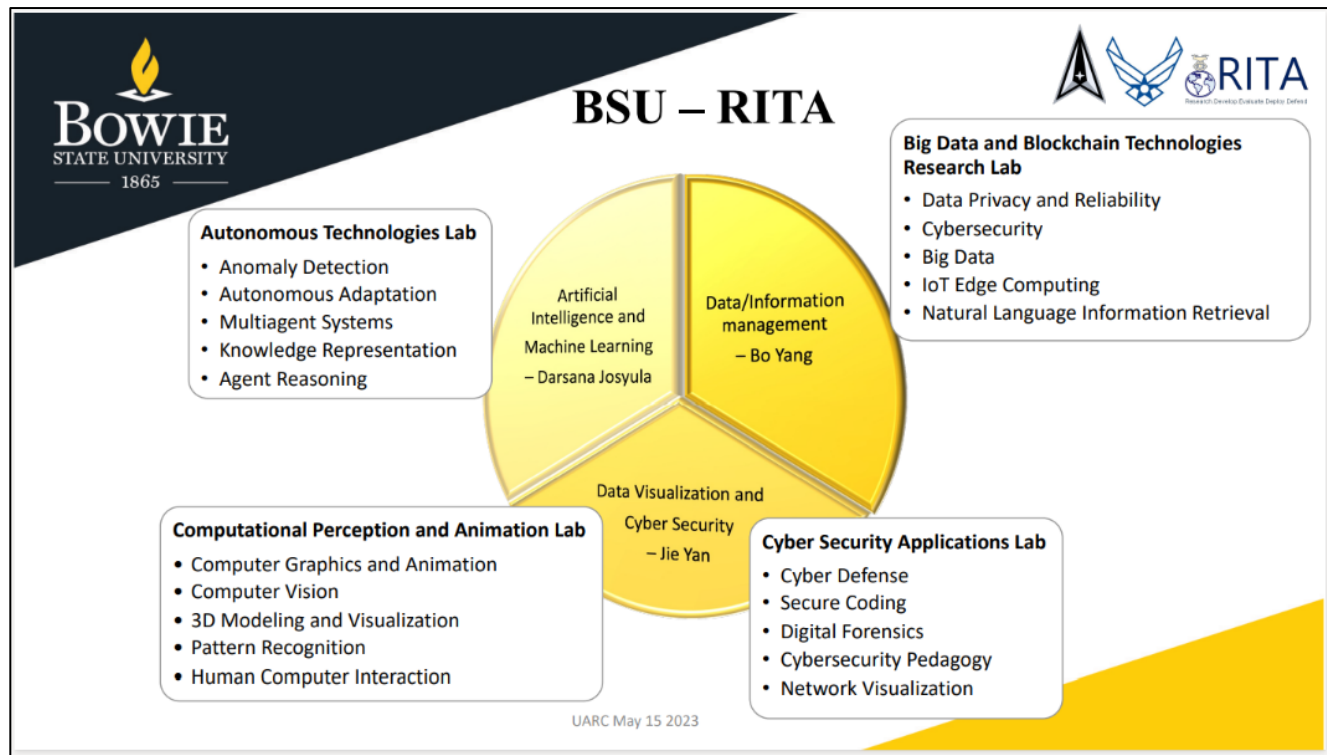
- Evaluation of current/planned capabilities
- Requirement generation for CUI compliant environment(s)

- CUI compliant MSOffice 365 installed
- Gov Access Enabled
- Consortium member enabled
- System Security Plan (SSP) Development
- Internal Security Assessment Planning



Consortium Conference 15-16 May 2023:

- **Clear understanding of the consortium processes and procedures for effective research center management**
- **Potential challenges at the individual university level**



BSU – RITA

Autonomous Technologies Lab

- Anomaly Detection
- Autonomous Adaptation
- Multiagent Systems
- Knowledge Representation
- Agent Reasoning

Artificial Intelligence and Machine Learning – Darsana Josyula

Data/Information management – Bo Yang

Data Visualization and Cyber Security – Jie Yan

Computational Perception and Animation Lab

- Computer Graphics and Animation
- Computer Vision
- 3D Modeling and Visualization
- Pattern Recognition
- Human Computer Interaction


Cyber Security Applications Lab

- Cyber Defense
- Secure Coding
- Digital Forensics
- Cybersecurity Pedagogy
- Network Visualization


Big Data and Blockchain Technologies Research Lab

- Data Privacy and Reliability
- Cybersecurity
- Big Data
- IoT Edge Computing
- Natural Language Information Retrieval

UARC May 15 2023



TOUGALOO COLLEGE
Where History Meets the Future



NORFOLK STATE UNIVERSITY

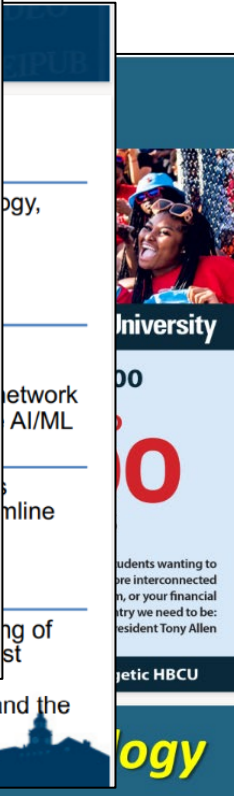
aviation

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management

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University

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students wanting to be interconnected, or your financial strategy we need to be: resident Tony Allen

etic HBCU

ogy

Alabama A&M, FAMU, Howard, Jackson State, Morgan State, NCA&T, Norfolk State, Prairie View, Southern, Tennessee State, Tuskegee, UDC, UMES, Virginia State, & Hampton University

Research Institute for Tactical Autonomy University Affiliated Research Center

May 15-16, 2023

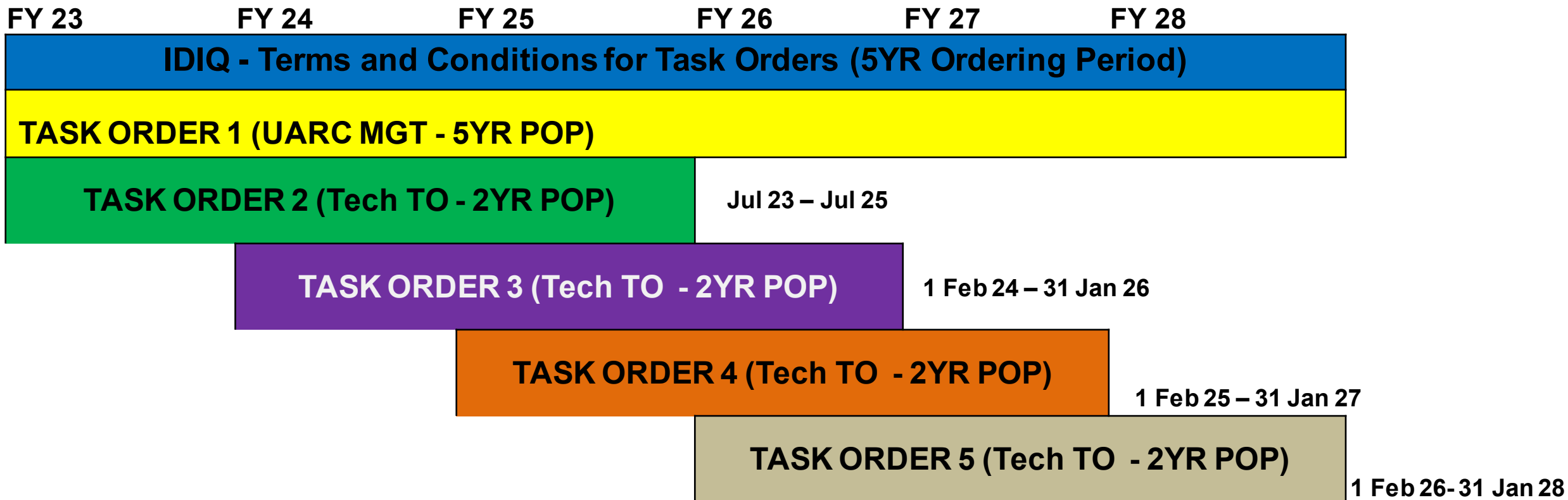
program of research into health data science. This includes the application of AI/ML techniques to the analysis of medical data and the pursuit of groundbreaking biomedical discoveries.



Task Orders



IDIQ and flow down CPFF Task Orders





Department of Defense/Department of the Air Force Reporting and Invoicing



Understanding the Contract Data Requirements List (CDRLs)

- 17 (CDRLs) are assigned to the Howard University contract
 - A001 Status Report (monthly)
 - A002 Contract Funds Status Report (quarterly)
 - A003 Presentation Materials (as required)
 - A004 Technical Report-Study/Services (as required)
 - Trade Studies, Analysis, and Investigations
 - A005 Acceptance Test Plan (as required)
 - A006 Acceptance Test Report (as required)
 - A007 Computer Software Product (as generated)
 - A008 Digital Imaging (as generated)
 - A009 Government Property Inventory Report (annually)
 - A010 Technical Report-Study/Services
 - Operations and Maintenance Instructions for Research and Development (R&D) Equipment
 - A011 Operations Security (OPSEC) Plan (as required)
 - A012 Project Planning Chart (semi-annually)
 - A013 Report, Record of Meetings/Minutes (as generated)
 - A014 Software User Manual (as required)
 - A015 Systems Safety Hazard Analysis Report (as required)
 - A016 Scientific and Technical Reports (as required)
 - A017 Technical Report-Study Services (as generated)
 - Invention Report

| CONTRACT DATA REQUIREMENTS LIST <i>(1 Data Item)</i> | | | | | | | | | | Form Approved OMB No. 0704-0188 | | | |
|---|--|--|------------------------|--|--|---|-------------------------------------|------------------|-----------------------|------------------------------------|--|-------|--|
| <small>The public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Executive Services Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please do not return your form to the above organization. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.</small> | | | | | | | | | | | | | |
| A. CONTRACT LINE ITEM NO. All CLINs | | | B. EXHIBIT A | | C. CATEGORY: TDP _____ TM _____ OTHER _____ | | | | | | | | |
| D. SYSTEM/ITEM | | | | E. CONTRACT/PR NO. FA9550-23-D-0001 | | | F. CONTRACTOR Howard University | | | | | | |
| 1. DATA ITEM NO. A001 | 2. TITLE OF DATA ITEM Status Report | | | | | 3. SUBTITLE | | | | | | | |
| 4. AUTHORITY (Data Acquisition Document No.) DI-MGMT-80368A | | | | 5. CONTRACT REFERENCE | | | 6. REQUIRING OFFICE See Block 16 | | | | | | |
| 7. DD 250 REQ LT | 9. DIST STATEMENT REQUIRED | | 10. FREQUENCY MTHLY | | 12. DATE OF FIRST SUBMISSION See Block 16 | | | 14. DISTRIBUTION | | | | | |
| 8. APP CODE N/A | See Block 16 | | 11. AS OF DATE 0 | | 13. DATE OF SUBSEQUENT SUBMISSION See Block 16 | | | a. ADDRESSEE | | b. COPIES | | | |
| 16. REMARKS Submit electronically. Each deliverable shall identify both the Contract No. identified in Block E and the Task Order Contract No. Block 6: As specified in individual Task Order PWS Block 9: All STINFO shall be marked with Distribution Statement F as follows: DISTRIBUTION STATEMENT F. Further dissemination only as directed by [insert controlling DoD office (CDO) identified in the Task Order PWS] (date deliverable is signed) or higher DoD authority. Distribution Statement F is preliminary only. Final distribution statement will be determined by the Government during the review process along with any additional CUI or export controlled markings as appropriate. Block 11: At the end of the contractor's monthly accounting period Block 12: 25 days after Block 11 Block 13: 25 days after end of subsequent monthly accounting period Block 14: Additional distribution addressees will be identified in the PWS. Distribution method, names and e-mail addresses shall be coordinated with the requiring office. | | | | | | | | See Block 16 | | Draft | | Final | |
| | | | | | | | | Reg | | Repro | | | |
| 15. TOTAL | | | | | | | | 0 | | 0 | | | |
| G. PREPARED BY Seana McNeal <small>Digitally signed by MCNEALSEANA.A.1281288411 DN: cn=Seana.A.1281288411, Date: 2023.01.13 09:42:49 -0500</small> | | | | H. DATE 01/13/2023 | | I. APPROVED BY Lexcie Potter <small>Digitally signed by POTTERLEXCIE.A.1273401187</small> | | | J. DATE 01/13/2023 | | | | |



Understanding the Contract Data Requirements List (CDRLs), ctd.

- Job aid document developed to assist in the easy consolidation and tracking for Howard University to report CDRLs

RITA UARC Monthly Status Reporting (A001)

| | |
|---------------------------------------|--|
| Contract Requirement(s): | |
| Contract Number: _____ | |
| Task Order Number: _____ | |
| Data Item Number: _____ | |
| Period of Performance: _____ | |
| PI - Principal Investigator: _____ | |
| Report Preparer: _____ | |
| Report Security Classification: _____ | |
| Distribution Statement: _____ | |

Research Reporting Components

| Professors/Researchers Engaged/Names & E-mails | Student Researchers Engaged / College Status: |
|--|--|
| • _____ | • <i>Jane Doe / 2nd year Grad Student</i> |
| • _____ | • <i>John Doe / Sophomore Undergrad</i> |
| • _____ | • _____ |

Narrative Reporting Updates

| | |
|--|--|
| Summary: | What is the overall project status, accomplished technical activities and development, objectives of efforts, summary results of effort, identify major problems/deficiencies with impact and recommendations? |
| Milestones Completed This Performance Period: | If applicable, is the project/task on schedule, if not what is the status of each milestone and plan of action. (Start / End dates) |
| Technical Accomplishments This Performance | Technical accomplishments |

| | |
|--|---|
| Period: | |
| Milestones to be Completed in Next Performance Period: | |
| New Problem Areas or Deficiencies Anticipated | Any problems that will affect the overall work effort of the project. |
| Itemized man-hour costs: | Itemized man-hour and cost expenditure incurred during the reporting period by category and task, total contractual expenditures and funds remaining as of reporting date. |
| Research Work Completed | A short/brief synopsis key research performed, aligned with contractual TASK(s) |
| Contract Deliverables Status for this CDRL and This Period of Performance | Data Deliverables within this CDRL/DID |
| Informational Deficiencies, if any? | <ul style="list-style-type: none"> - What was missing? - Were there any difficulties? - Do you need further explanation and/or support from SMEs or Professors? - Government - Consortium Members/Lead |
| Overall Project Health: (Red, Yellow, Green). Each issue clearly identified, if applicable. | - |

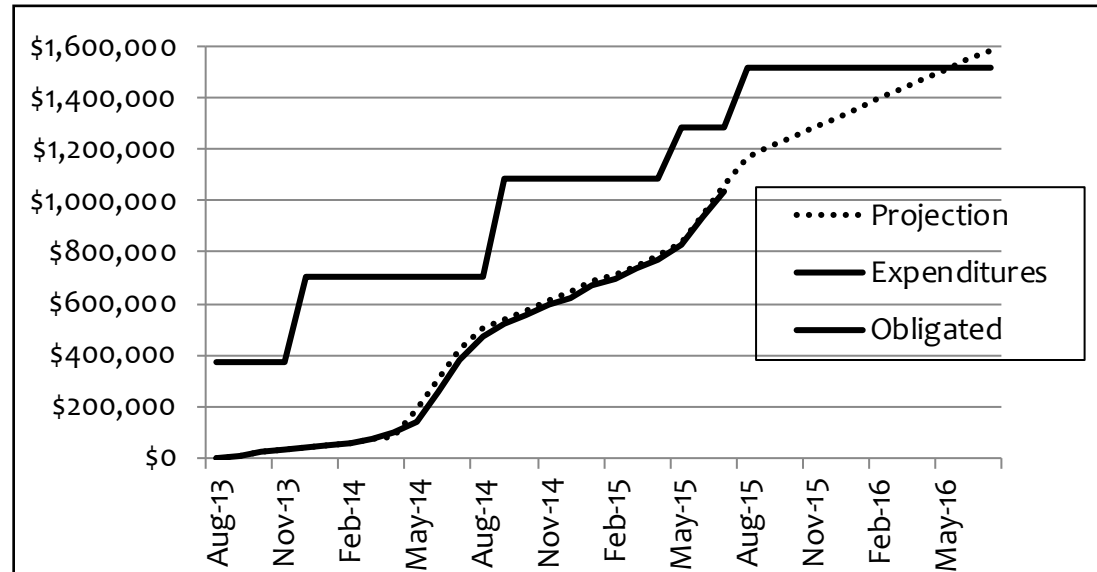
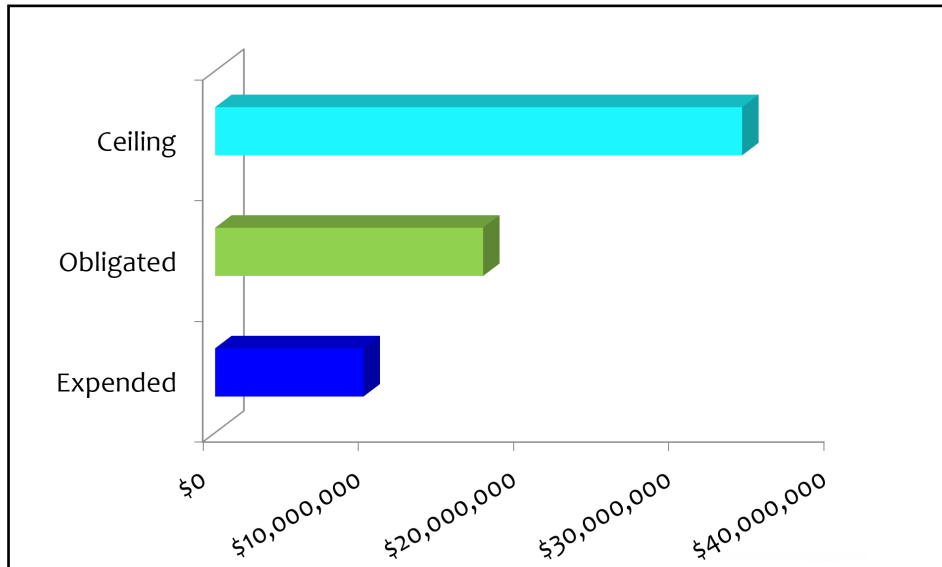
| | | |
|---|---|---|
| Mitigation Strategy/Course Correction for Each Issue Noted Above (if applicable). Should also include an estimated timeline. | - | |
| CDRLs: A002-A017 report on these CDRLs in accordance with or stated frequency or as generated | A001 - Monthly A002 - Quarterly A003 - As Gen/Req A004 - As Gen/Req A005 - As Gen/Req A006 - As Gen/Req A007 - As Gen/Req A008 - As Gen/Req A009 - Annual | A010 - As Gen/Req A011 - As Gen/Req A012 - Semi-annually A013 - As Gen/Req A014 - As Gen/Req A015 - As Gen/Req A016 - As Gen/Req A017 - As Gen/Req |



Importance of Timely Invoicing

- Ensures timely payment to consortium members
- Shows your institution(s) is staying on track with tasks requirements
- Enables for the next installment(s) of funds to be issued as expected
- Government team can report expenditures being executed appropriately

Reference examples of tracking funding execution





University Leadership:

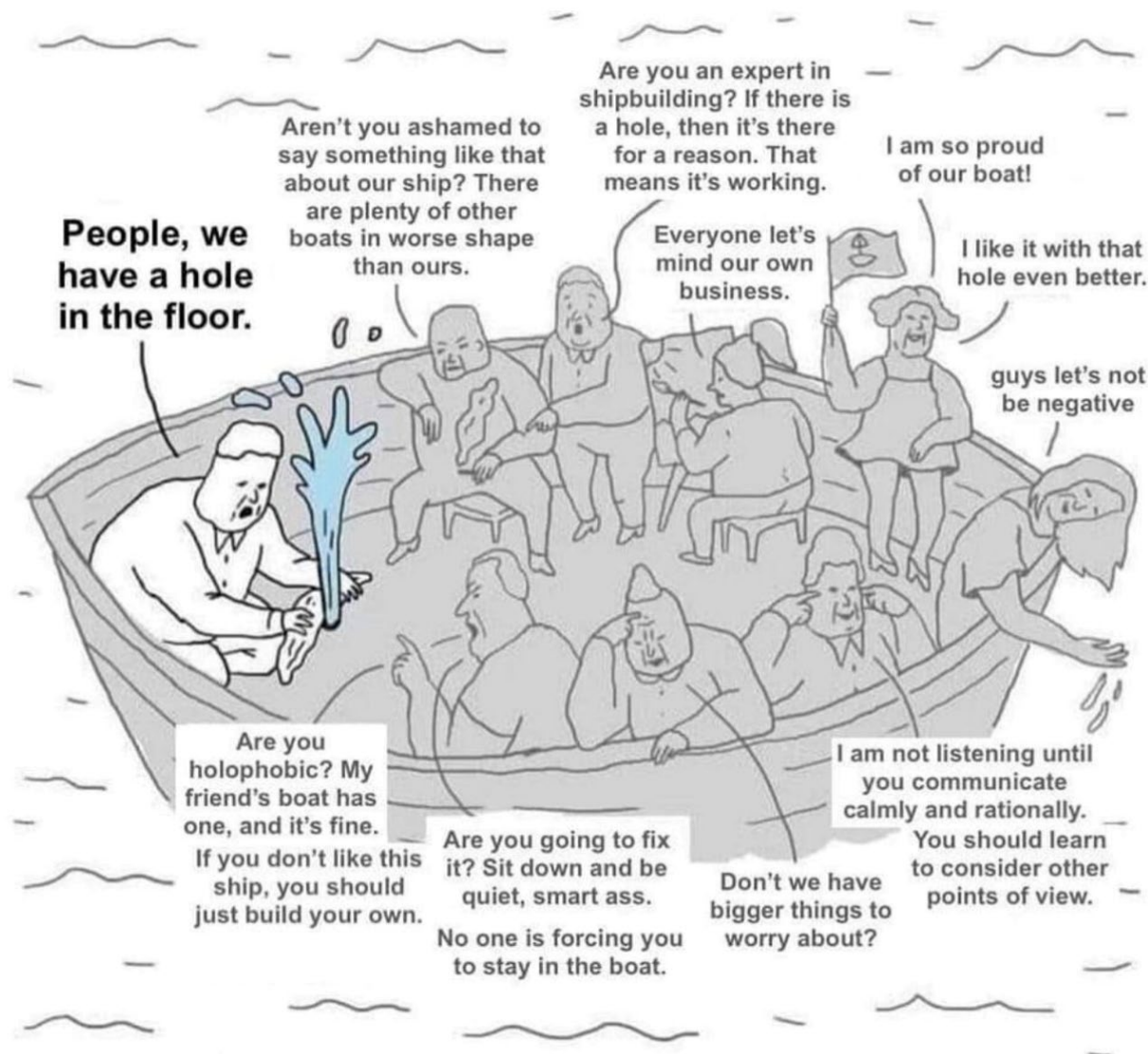
- Critical to success
- Resource appropriately
- Understand/Apply Consortium Coordination Plan Requirements
 - ◆ Legal implications
 - ◆ IP rights/responsibilities
 - ◆ Compliance
 - ◆ Rates / Fee Structure
- Communication

Opportunities:

- NRO
- NIA
- USSOCOM
- Industry
- *Additional Universities*



Do not Suffer in Silence





Questions?



Important Dates



| | |
|----------------|--|
| 7 Feb 2023 | SAF/AA PEM Parade (Personnel) |
| 6 Apr 2023 | UNCF Meeting |
| 6 Apr 2023 | TCRDF Meeting |
| 7 Apr 2023 | Gartner Workshop (HypeCycle) |
| 10 Apr 2023 | Hampton / Norfolk Visit |
| 11 Apr 2023 | Bowie State Visit |
| 12 Apr 2023 | HSI Tagup |
| 18 Apr 2023 | Delaware State Visit |
| 21 Apr 2023 | Naval Intel Activity meeting (Rooney) |
| 21 Apr 2023 | Peake's Community Led Cyber Defense |
| 24 Apr 2023 | 90% of HU UARC Hires |
| 27 Apr 2023 | FFRDC/UARC Program Managers Forum |
| 1 May 2023 | MSRDC (MSI STEM Research & Development) Meeting |
| 3 May 2023 | Consortium Conference Agenda Finalization |
| 4 May 2023 | UARC Consolidation Discussion (CDM/Dr. Starr) |
| 10 May 2023 | A1 Discussion on STEM Recruiting |
| 10 May 2023 | HBCU/MSI Workshop WPAFB |
| 15-16 May 2023 | RITA Consortium Conference |
| Jun 2023 | TO 2 (Technical) |
| Jun 2023 | MIT AI CCA Workshop |
| Jun 3-6 2023 | NSPAA Workshop |
| Jun 20-22 | USD(R&E) AI Workshop (Technical Baseline) |
| 11-13 Sep | AFA Air, Space & Cyber Conference |
| 9-11 Oct | AUSA Association of the US Army |
| 29 Jan – 1 Feb | CCME (Council of College and Military Educators) |
| 18 Jan 2028 | Contract Completion |