

UPIISC UNIVERSITY OF
PITTSBURGH
INFRASTRUCTURE
SENSING

COLLABORATION WORKSHOP



2023 UPIISC Update & Progress on Action Items



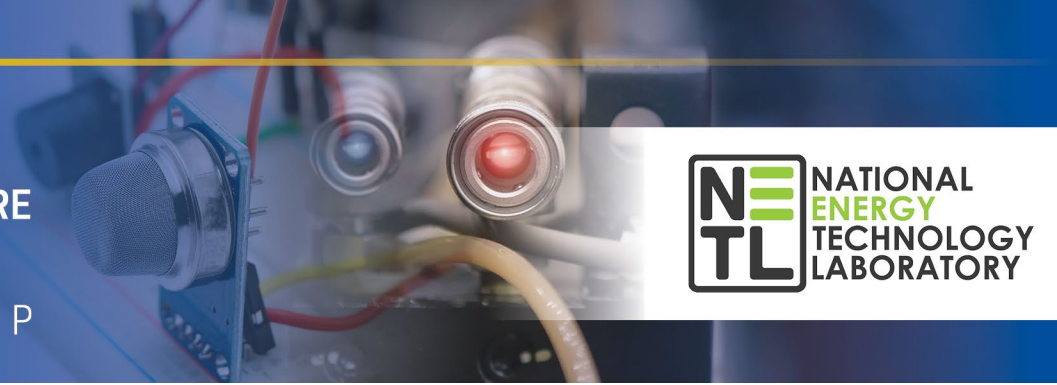
*Cathedral of Learning
University of Pittsburgh*

Prof. Paul R. Ohodnicki, Jr.
University of Pittsburgh

Dr. Ruishu Wright
National Energy Technology Lab.

Date: November 8th, 2023





2022 UPIISC Inaugural Workshop : August 2022



UPIISC UNIVERSITY OF PITTSBURGH
INFRASTRUCTURE SENSING
COLLABORATION WORKSHOP

UPIISC Inaugural Workshop
August 2022

Energy Innovation Center

www.engineering.pitt.edu/UPISC

75 Registered Attendees

Strong Feedback and Dialogue
Encouraged Annual Offering as Well as
Action Items Into the Future

Highly Successful Initial Workshop Held in 2022 Confirmed the Need and Opportunity

Expanding and Build Upon Partnerships Moving Forward



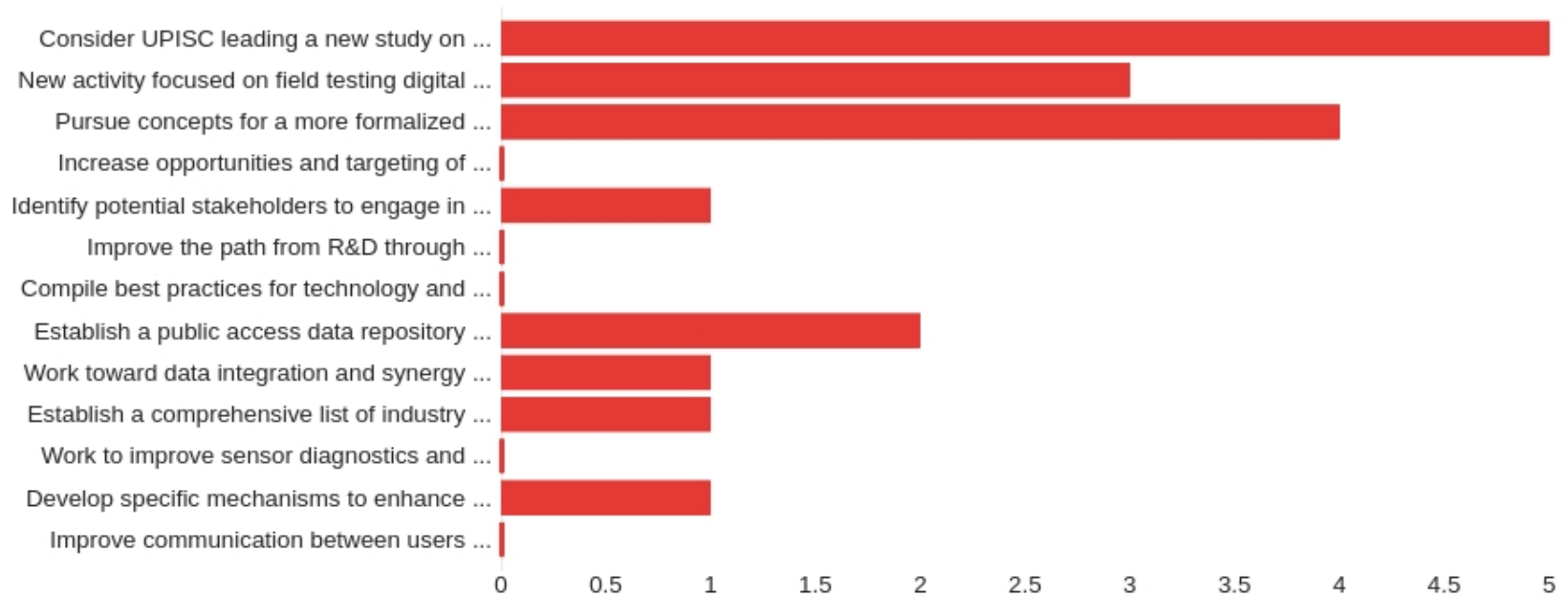
Examples of Organizations in Attendance at Previous 2022 Meeting or Collaborating

Potential Pathways Forward and Action Items From August 2022 Meeting

1. Consider UPIISC leading a new study on this topic (National Academies?)
2. New activity focused on field testing digital twins (data normalization, experimental facilities, etc.)
3. Pursue concepts for a more formalized collaboration (center, major proposals, etc.)
4. Increase opportunities and targeting of workforce training in universities.
5. Identify potential stakeholders to engage in the future
6. Improve the path from R&D through commercialization and technology transfer.
7. Compile best practices for technology and knowledge dissemination and adoption.
8. Establish a public access data repository to collect and share information among stakeholders
9. Work toward data integration and synergy standardization across infrastructure segments
10. Establish a comprehensive list of industry needs
11. Work to improve sensor diagnostics and reliability, potentially even self-diagnosing sensors.
12. Develop specific mechanisms to enhance collaboration of industry, academia, government, others.
13. Improve communication between users and developers.

Collaborated with Steering Committee to Prioritize “Top Three”

UPIISC Survey Results of Steering Committee Recommendations



1. Consider UPIISC leading or initiating a new study on this topic
2. Pursue concepts for a more formalized collaboration
3. New activity focused on field testing digital twins

Subsequent “Top Three” Vote to Determine Prioritized Next Steps with UPIISC

Recommended Next Steps for High Priority Action Items

1. Potential Agencies / Groups to Engage:
 1. Department of Energy
 2. Department of Transportation
 3. National Geospatial Intelligence Agency
 4. State, Regional, and City of Pittsburgh



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2. Identify Potential Venues and Vehicles:
 - National Academies
 - Consultants
 - Professional Societies



NATIONAL ACADEMIES Sciences
Engineering
Medicine

3. Develop and submit a proposal – Targeting Calendar Year 2024 / 2025

Recommendation #1: UPIISC Initiates a New Study On This Topic

Recommended Next Steps for High Priority Action Items

1. Established an MOU Between NETL and U. Pitt. (Completed 1/2023)
2. Considering Other Mechanisms to Formalize Partner Participation
3. Pursue Collaborations and Joint Proposals
 - EERE H2 Shot, Earthshot, ARPA-E ULTRAFast, NSF, etc.
 - **Funding Successes!** ARPA-E SEA CO2, DOE GMI
 - **Partnership Successes!** 2 – Joint R&D 100 Awards (2022, 2023)

U. Pitt and NETL
Joint R&D 100 Awards
and Funding Support!

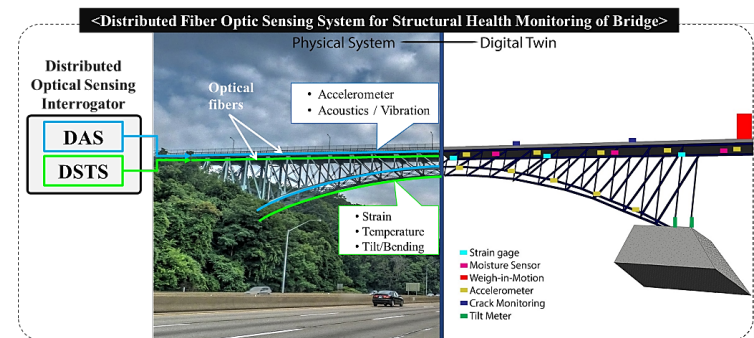


Recommendation #2: Pursue Concepts for a More Formalized Collaboration

Recommended Next Steps for High Priority Action Items

1. City of Pittsburgh Collaborations
 - Real-Time Monitoring of Bridges (Distributed Sensing + Digital Twins)
 - Submitted to 2023 SMART Cities and U. Pitt. Momentum Funds, Pending
2. Regional Roadmapping Exercise Discussions
 - Infrastructure Sensing in Pittsburgh and the Region
 - Information Could Be Utilized in Future Regional or National Studies
3. Other UPIISC Industry Partners – Also Interested in Collaboration

U. Pitt, NETL, and
City of Pittsburgh
Collaborations!



Recommendation #3: New Activity Field Testing of Digital Twins

Topical Areas and Applications to Cover at 2023 UPIISC Workshop

1. DOE

- H2 Infrastructure - Emphasis
- Electric Power Grid - Emphasis



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ENERGY



2. DOT

- Civil / Transportation Infrastructure - Emphasis



3. Sensor Alignment (Applications and Capabilities)

- Value Proposition
- Standards and Requirements
- Installation Costs and Challenges
- Networking and Integration
- Technological Relevance
- Digital Twin Integration and Analytics



GE VERNOVA



gecko
robotics

Moving Forward into 2024 and Beyond... Let's Keep the Momentum Going!



October 2023 – EIC
Visit from DOE Secretary Granholm

1. Continued Progress on Existing Action Items
 - UPIISC Initiated Study
 - Formalization of UPIISC Collaboration
 - Initiate New Project Activities
2. Identification of New Action Items
 - City of Pittsburgh / Regional Roadmap?
 - Other Ideas?
3. Strengthen Partnerships and Broaden Collaborations to Maximize Impacts
4. Coordinate with Other Existing Initiatives and Activities at Pitt, NETL, and Other Partners

Any Questions, Comments, or Discussion?