

WELCOME!

We will begin promptly at 8:00 am



*Cathedral of Learning
University of Pittsburgh*

**Welcome Remarks and
Workshop Overview**

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

Ruishu F. Wright, Ph.D.
National Energy Technology Lab.

Date: August 25th, 2022



Natural Gas, Oil, & H₂ Transport & Storage



Civil (Road, Bridges, Water)

Electricity Grid Transport & Storage

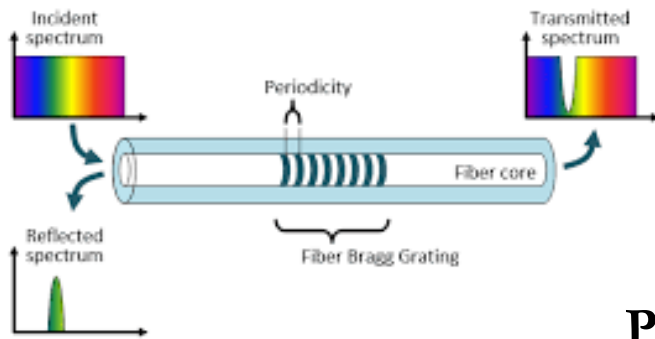


Conventional & Renewable Generation

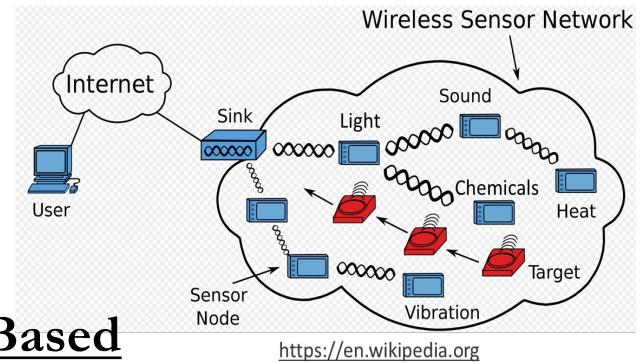


Mission: UPIISC Seeks to Pursue Research and Innovation, Workforce Development, and Technology Transfer in the Area of Critical Infrastructure Sensing and Monitoring

Optical Fiber Sensing

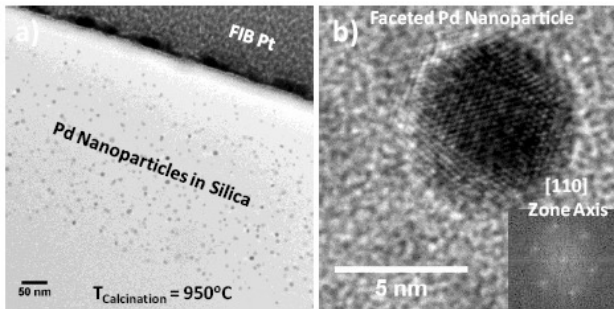


Passive Wireless Sensing

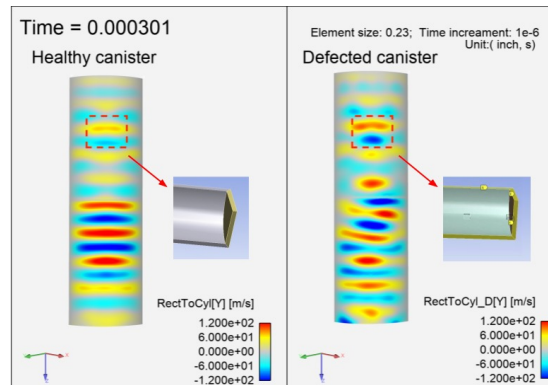


Physics Based

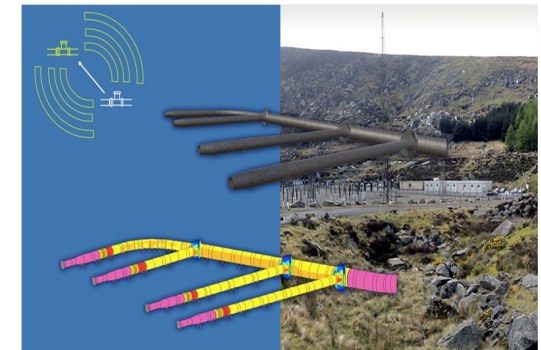
Novel Sensing Materials



Machine Learning & AI

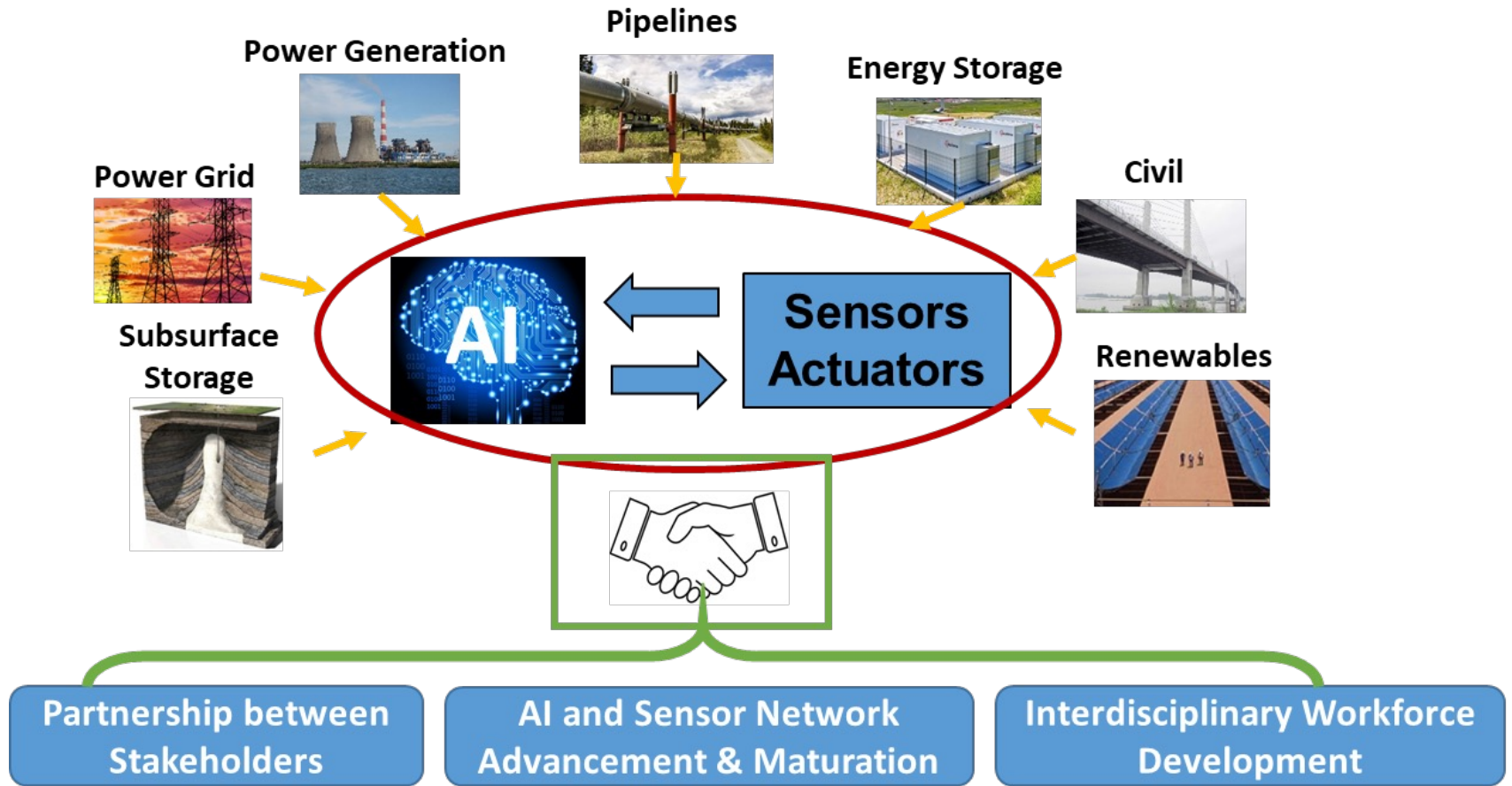


Digital Twin Models



Enabling Technologies: UPIISC Scope Encompasses all Aspects of Critical Infrastructure Sensing Spanning Enabling Technology, Hardware, Communications, Data, and Analytics.

Objective of UPIISC Workshop : Community and Partnership Development



University, Lab, Industry, and Government Partnerships are Necessary to Maximize Impact

How Can We Expand and Build Upon Partnerships Moving Forward?



GOALS

The goals of the workshop are to increase awareness of existing on-going research and collaborations with University of Pittsburgh and regional stakeholders in the following areas:

1. Development of novel sensor technologies as solutions to infrastructure sensing needs;
2. Regional collaboration to promote workforce development in the emerging sensor area for near-term R&D capability needs and future deployment and commercial needs;
3. Engagements with industry and stakeholders, regarding sensor technologies and related technology transfer;
4. Team and collaboration partnerships capable of responding to funding agencies' and industry's call for sensor technologies.

**Voice of Industry and
Government Stakeholders**

**Technology Maturation and
Technology Transfer**

**Workforce
Development**

SCOPE

The workshop particularly seeks to focus on the following areas:

1. Multiple sensing platforms with spatially distributed sensing capability (e.g. optical fiber sensing, passive wireless sensors, electrochemical sensors, chip sensors)
2. Spanning sensor technology development areas from fundamental principles of sensor materials to prototypes in field validations, prototypes in field validations,

IMPACT

The workshop seeks to promote intelligent infrastructure sensing for the following impacts:

1. Predictive monitoring before infrastructure failures occur (structural, electrical, etc.)
2. Mitigation of green-house gas emissions,
3. Enabling large-scale H₂ transportation,
4. Supporting needs for a robust and resilient electricity and natural gas transportation and delivery system,
5. Early detection of environmental contamination.

STEERING COMMITTEE MEMBERS

The steering committee is a group of prominent scientists and leaders that were carefully selected to represent key segments and application areas of critical importance to the UPittISC objectives. The advisory group provides the faculty and leadership team with insights about emerging needs and trends within relevant industries and across various agencies.

Tony Lindsay, GTI, Managing Director, tlindsay@gti.energy

Josh Gould, Duquesne Light Company, Director, Innovation, jgould@duqlight.com

Susan Maley, Electric Power Research Institute (EPRI), Program Manager, smaley@epri.com

C. Ravi, Aquatech, ravic@aquatech.com

Saba Almalkie, Ansys, Engineering Manager, Digital Twins, saba.almalkie@ansys.com

Robert Lieberman, Lumoptix, President, lumoptix@aol.com

Gary Choquette, Pipeline Research Council International (PRCI), gchoquette@prci.org

Arvind Tiwari, GE Research, arvind.tiwari1@ge.com

THURSDAY – AUGUST 25, 2022

(ALL REGISTERED ATTENDEES)

Morning Agenda

8:00 am	Welcome Remarks and Introduction to the Workshop – Objective, Scope, Steering Committee
8:10 am	Keynote Speaker Introduction
8:15 am	Keynote Speakers – Case for a Sensing Collaboration <ul style="list-style-type: none">• 15-min – Dr. Mike Holland, Vice Chancellor for Science Policy and Research Strategies, University of Pittsburgh• 15-min – Dr. Bryan Morreale, Associate Laboratory Director for Research & Innovation Center, NETL
8:45 am	Topic One Speaker Introduction
8:50 am	Topic One – EPRI Perspective on Advanced Sensing Needs <ul style="list-style-type: none">• 20-min – Ron Schoff, EPRI• 10-min Q&A
9:20 am	Workshop Logistics – Day One, Morning
9:25 am	Break

9:40 am **Topic Two Speaker Introduction**

9:45 am **Topic Two – Sensor Device Technologies – Optical, Passive Wireless, IC, etc.**

- 15-min – Ruishu Wright, NETL
- 15-min – Paul Ohodnicki, University of Pittsburgh
- 10-min Q&A

10:25 am **Topic Three Speaker Introduction**

10:30 am **Topic Three – Sensor Data Communication, Integration, and Analytics**

- 20-min – Christopher Ziolkowski, GTI Energy
- 10-min Q&A

11:00 am **Panel Introduction**

11:10 am **Sensing Opportunities and Needs – Industry, University, and National Lab Perspective Panel**

- Moderator – Ruishu Wright, NETL
- 5-min Panelist 1 – Susan Maley, EPRI
- 5-min Panelist 2 – Elizabeth Cook, Duquesne Light
- 5-min Panelist 3 – David Alman, NETL
- 5-min Panelist 4 – Gary Choquette, Pipeline Research Council International
- 35-min Moderated Q&A

12:10 pm **Logistical Announcements / Lunch / Networking Break**

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Afternoon Agenda

1:15 pm	Afternoon Announcements
1:20 pm	Topic Four Speaker Introduction
1:25 pm.	Topic Four – Physics Based Models and Digital Twins in Industry <ul style="list-style-type: none">• 20-min – Sameer Kher, Ansys• 10-min Q&A
1:55 pm	Topic Five Speaker Introduction
2:00 pm	Topic Five – Geo-Analytics and Machine Learning for Infrastructure <ul style="list-style-type: none">• 20-min – Kelly Rose, NETL• 10-min Q&A
2:30 pm	Topic Six Speaker Introduction
2:35 pm	Topic Six – Digital Twin Models and Interfacing with Real-Time Sensing <ul style="list-style-type: none">• 20-min – Lea Boche, EPRI• 10-min Q&A
3:05 pm	Break

3:30 pm **Second Panel – How Can We Partner to Create Opportunity and Have Impacts?**

- Moderator – Paul Ohodnicki, University of Pittsburgh
- 5-min Panelist 1 – Saba Almalkie, Ansys
- 5-min Panelist 2 – Joshua Gould, Duquesne Light)
- 5-min Panelist 3 – Robert Lieberman, Lumoptix
- 5-min Panelist 4 – Robie Lewis, NETL
- 5-min Panelist 5 – Arvind Tiwari, General Electric
- 30-min Moderated Q&A

4:35 pm **Summary of Action Items and Preparation for Report Out**

4:40 pm **Looking to the Future and Next Steps**

- Paul Ohodnicki (University of Pittsburgh), Ruishu Wright (NETL), James Ferguson (NETL)
- Workshop closeout report discussion
- Where we go from here and how to be involved?
- Etc.

5:10 pm **Final Remarks and Poster Session Summary**

5:15–6:30 pm **Poster Session with a Social Hour and Light Refreshments**
