



2024

i-ETC 2024: The Fourth Annual Intermountain  
Engineering, Technology, and Computing Conference

Theme: *Unleashing Innovation*

## Welcome Message

On behalf of the organizing committee, I extend a warm welcome to all attending the fourth annual Intermountain Conference on Engineering, Technology, and Computing. The theme of this year's conference is Unleashing Innovation. The theme expresses a dynamism expressed by the lifeblood of this conference: young investigators, including students. While we get contributions from a wide swath of engineers and scientists, the vibrancy of this conference is manifest primarily in the fresh ideas of those just entering the world of research.

And, indeed, this conference is vibrant! This year we had 103 paper submissions with 83 papers accepted for presentation and publication. Of the accepted papers, 59 are in engineering, 7 are in technology, and 17 are in computing, all of which will be presented in 19 paper sessions. We will also have 39 posters presented in two poster sessions. A big thanks to the veritable army of reviewers who made our conference program possible!

We will also hear from two great keynote speakers, Michael Masquelier, Chief Commercial Officer of the ASPIRE NSF Engineering Research Center, and Adam Robertson, co-founder and CTO of Fortem Technologies and former member of the Utah house of representatives. Couple those with over 100 technical talks and posters and it becomes clear that now is an exciting time to be involved in i-ETC!

I look forward to a wonderful and stimulating conference.

John Edwards  
General Chair, i-ETC 2024  
Logan, Utah, USA

Sponsors



## Schedule Overview

### Monday May 13

- 9:00 **Plenary and keynote** (Main 121)  
Michael Masquelier  
Chief Commercial Officer, ASPIRE NSF Engineering Research Center
- 10:20 **Break**
- 10:40 **Paper session 1**  
Engineering: Embedded Systems and Digital Design Innovations (Main 326)  
Engineering: Construction Technology Innovations (Main 115)  
Technology: Careers & AI; Quality of Life (Main 119)  
Computing: Algorithms & Cybersecurity (Main 121)
- 12:20 **Lunch and poster session 1** (TSC, Sunburst Lounge)
- 1:40p **Paper session 2**  
Engineering: Robotics and Automation I (Main 326)  
Engineering: Innovations in Medical Device Technology (Main 115)  
Technology: Applications of Technology (Main 119)  
Computing: CS Education and Classroom Experience (Main 121)
- 3:00p **Break**
- 3:20p **Paper session 3**  
Engineering: IoT and Machine Learning Applications (Main 326)  
Engineering: Advancements in Concrete Technology (Main 115)  
Engineering: Control and Optimization Techniques (Main 119)  
Computing: Data Science & Machine Learning (Main 121)

### Tuesday May 14

- 9:00 **Plenary and keynote** (Main 121)  
Adam Robertson  
Co-founder and CTO, Fortem Technologies; Utah House of Representatives
- 10:00 **Break**
- 10:20 **Paper session 4**  
Engineering: Robotics and Automation II (Main 326)  
Engineering: Advanced Fabrication and Optical Devices (Main 115)  
Engineering: Transportation and Infrastructure Studies (Main 119)  
Computing: Wireless Network & Communication (Main 121)
- 12:00 **Lunch and poster session 2** (TSC, Sunburst Lounge)
- 1:20p **Paper session 5**  
Engineering: Advanced Machine Learning Applications (Main 326)  
Engineering: Transportation Safety and Infrastructure (Main 115)  
Engineering: Measurement and Sensing Technologies (Main 121)
- 2:45p **Closing plenary and awards** (Main 121)
- 3:00p **Aggie Ice Cream on the Quad**



## i-ETC Committee Members

### Executive

General chair	John Edwards (USU)
General co-chair	Spencer Guthrie (BYU)
General co-chair	JP Tang (UVU)

### Program

Program chair	Brad Whitaker (MSU)
Engineering track chair	Taher Deemyad (ISU)
Technology track chair	Barry Lunt (BYU)
Computing track co-chair	Sayeed Sajal (UVU)
Computing track co-chair	Frank Jones (UVU)
Poster chair	Dan Hatch (UVU)


### Advisory committee

Mohammad A.S. Masoum (UVU)
Kelly Flanagan (UVU)
Neil Harrison (UVU)
Stephen Schultz (BYU)

### Support

IEEE liaison	Mohammad Shekaramiz (UVU)
Treasurer	Todd Palmer (UVU)
Web chair	Dan Hatch (UVU)
Web support	Belle Edwards (UVU)
Sponsorships	Stefan Harlan (UVU)
Chair, IEEE Utah	Shanker Shrestha
Chair, IEEE Utah PES	Masood Parvania
Registration	Dawn Stuver (UVU)

## Detailed Schedule

 indicates a best paper award nominee

### Monday May 13

#### 9:00 **Plenary and keynote (Main 121)**

**Michael Masquelier**

**Chief Commercial Officer, ASPIRE NSF Engineering Research Center**



Michael holds the role of Chief Commercial Officer at ASPIRE, Utah State University's Engineering Research Center, which works to improve health and quality of life by catalyzing sustainable and equitable electrification across the transportation industries. Prior to his role at ASPIRE, Michael served as CEO and CTO at WAVE, where he led the team that developed today's market-leading wireless charging solutions for commercial electric vehicles. In leadership roles at Motorola, Michael architected a mobile sensing platform to serve the enterprise, consumer, and government markets. He holds a B.S.E.E. from the University of Illinois at Urbana-Champaign, an M.S.E.E. from Arizona State University and holds patents in wireless power transfer, power electronics and microelectronics. He also serves as co-chair of the SAE J2954 Heavy Duty standards committee on wireless charging of electric vehicles.

#### 10:20 **Break**

#### 10:40 **Paper session 1**

##### **Engineering: Embedded Systems and Digital Design Innovations (Main 326)**

10:40 Redesigning Embedded System I Course  
*Farzad Ahmadi; Abolfazl Amin*

11:00 The Digidot: A Low-Cost, Haptic-Enabled Implementation of the Braille Writing Device  
*Christian Poulsen; Zachary Ward; Afsaneh Minaie*

11:20 A Comparison of Many Approaches to Solving the Multiple Traveling Salesman Problem  
*Derek Redmond; Greg Droge; Mark Soulier*

11:40 Digital Design Education Using an Open-Source, Cloud-Based FPGA Toolchain  
*Weston Smith; Zachary Driskill; Jeffrey Goeders; Michael Wirthlin*

12:00 Image Classification of Forest Fires Using Machine and Deep Learning 🏆  
*Mason Davis; Mohammad Shekaramiz*

### **Engineering: Construction Technology Innovations (Main 115)**

10:40 Exploring the Level of Awareness and Acceptance in Using Innovative Technologies Concerning Safety Performance in the Construction Industry in the Philippines  
*Elijah James F. Lumanlan; Krista J. Eseo; SJ Louis F. Bayazid; Gilford B. Estores*

11:00 Advancements and Insights in Autoclaved Aerated Concrete: A Comprehensive Review in Sustainable and Resilient Structural Design  
*Hunter Scoresby; Zoey Duncan; Andrew South; Taylor J. Sorensen*

11:20 Optimizing Concrete Mixture Designs for Additive Manufacturing: A Review of 3D Concrete Printing  
*Ivy Stout; Grant Godfrey; Jenna Dayley; Dexter Rodriguez; W. Spencer Guthrie; Taylor J. Sorensen*

11:40 Stiffness and Strength of Concrete Comprising Natural Pozzolans Available in Utah  
*Battsagaan Ilch*

12:00 Beneficiation of Clayey Soils Using Aggregate Blending and Cement Stabilization  
*Adam Guthrie; W. Spencer Guthrie; Robert J Stevens*

### **Technology: Careers & AI; Quality of Life (Main 119)**

10:40 The Implication of AI Tools on Job Market and Skill Requirements  
*Samaya Pillai; Suparna Bera; Pankaj Pathak*

11:00 AI-Powered Customized University and Career Guidance 🏆  
*Shadi Jawhar; Jeremy Miller; Zeina Bitar; Mohamad Jawhar*

11:20 Advanced Mobility: Integrating Visible Light Communication and Sensing Technologies  
*Khaled Shaaban; Muhammad Asif Khan; Hamid Menouar; Ridha Hamila*

11:40 Adaptive UI/UX for Smart Geriatric Users  
*Samyam Narayan; Vishnu Athreya; Keerthi Raghavendra; Srujana Golla; Nitin Pujari*

### **Computing: Algorithms & Cybersecurity (Main 121)**

10:40 An Analysis of Informed Search Algorithms Applied on Road Networks  
*David De Leo; Jacob Banuelos; Imtiaz Parvez*



11:00 Improving Malware Detection From Binary Control Flow Graphs Using Supervised Learning

*Bryan Portillo; Bradley M Whitaker; Kaveen Liyanage*

11:20 Comparative Empirical Analysis of Dancing Links Implementations to Solve the Exact Cover Problem

*Andrija Sevaljevic; Paul Bodily*

11:40 Robust Parameterization of Swept Geometries for Isogeometric Analysis

*Caleb B. Goates; Kendrick M Shepherd*

12:00 Addressing the Challenge of Missing Medical Data in Healthcare Analytics: A Focus on Machine Learning Predictions for ICU Length of Stay 🏆

*Mahmad Isaq Karankot; Max Marceau; Ethan M. Glenn; Rylan P Fowers; David Hedges; Bonnie Sheehey; Bradley M Whitaker*

## 12:20 **Lunch and poster session 1 (TSC, Sunburst Lounge)**

Evaluating Cyanobacteria and Cyanotoxins in Surface Water and Aerosols near Utah Lake

*Dylan McPeake, Donal Olsen, Issac Orrill, Randal Martin, Joan McLean, Sierra Young*

Recreating the Past: A Digital Exploration of the 6th Century Basilica at Horvat Beit Loya

*Joseph Laudie, Thomas Cryer, Brandon Ro*

"Spirit of the Condor" Exploring the Orientation of Bolivian Sacred Architecture

*Samuel Zenteno, Brandon Ro*

Advancing Camera-Based Monitoring for Operational Hydrologic Applications

*Razin Bin Issa, Safran Khan, Sajan Neupane*

An Innovative Solution for Autonomous Precision Pest Control

*Khadijeh Bazargani Bazargani*

Artificial Intelligence Baby Monitoring System

*Logan Chenworth, Hunter Johnson*

Automated Optimal Parameter Tuning of the Fast Multipole Method with Error Constraint

*Porter Nelson, Ryan Anderson, Andrew Ning*

Autonomous Surveillance Breakthrough by Implementing Facial Recognition in Dog Robots

*Amir Hafezi, Taher Deemyad, Minhaz Zibran*

Autonomous Wind Turbine Inspection using DJI Matrice 300 RTK Drone and AI Path Planning

*Angel Rodriguez, Joshua Zander*

Beyond Boundaries: LIDAR and Depth Camera Fusion in Remote Ground Navigation

*Kyler Draper*

Bluetooth Steering Wheel for Enhanced Virtual Gaming Experience and RC Control

*Jeremiah Engel, Aidan Young, Afsaneh Minaie*

Building a Single Pixel Camera

*Cole Alldredge, Alex Young*

ChatGPT in Aiding Software Development: An Empirical Study

*Costain Nachuma, Arifa Islam Champa, Md Fazle Rabbi, Minhaz F. Zibran*

Crafting the Shield Against Email Phishing with Curated Datasets

*Arifa islam Champa, Md Fazle Rabbi, Minhaz Zibran*

Data Augmentation and Neural Network for Football Formation Recognition

*Audrey Hong, Benjamin Orr, Shad Torrie, D.J. Lee*

Design of a Low-Cost Home Security System

*Hua Tang, C. Silmanan, J. Durie, B. johnson*

Designing a Robotic Dinosaur Skeleton Inspired by Oryctodromeus Biomimetic Locomotion

*Kyler C. Bingham, Amir Hafezi, Anish Thapa, Sara Sourani Yancheshmeh, Christopher Zakrevski, Matthew Berry, Shaibal Das, Payton Walker, Juan Cortez Lopez, Dominik Thompson, Robert J. Gay, Taher Deemyad*

Designing Home: An Architectural Analysis of Transitional Housing for Foster Youth

*Rebekah Phillips, Brandon Ro*

Enhancing constructability and durability of electrified roadways

*Utkarsha Bhetuwal, Bethany Romney, Srishti Banerji, Marv Halling*

## 1:40pm **Paper session 2**

### **Engineering: Robotics and Automation I (Main 326)**

1:40 Mission Planning and Execution Architecture for Robotic Systems Using BPMN

*Justin Whitaker; James Swedeen; Greg Droge*

2:00 Design and Kinematic Analysis of an Aerial Robotic Arm for Precision Agriculture 🏆

*Kyler C. Bingham; Taher Deemyad*

2:20 Effect of Autonomous Vehicles on Roundabout Efficiency Through Microsimulation Analysis

*Mohammad Shareef Ghanim; Khaled Shaaban*

2:40 Source Localization Using a Single Array of Sensors in Nearfield Configuration, and Application to Active Noise Cancellation

*Todd Moon; Mohammad Shekaramiz; Jake Gunther*

### **Engineering: Innovations in Medical Device Technology (Main 115)**

1:40 Near-Field Magnetic Loop Antenna for Fetal Cardiac Monitoring

*Jacob M LeFevre; Preston K Manwaring; Ben Merrell*

2:00 Liver Cancer - Tumor Detection Using Image Processing and ML Techniques

*Palak Chhajed*

2:20 Development of a Bio-Inspired Microfluidic Valve

*Todd Flake; Reece Villella; Matthew S Ballard*

2:40 Low-Power Embedded ECG Acquisition System for Real-Time Monitoring and Analysis

*Hiren Mewada; Deepanraj Balakrishnan*

### **Technology: Applications of Technology (Main 119)**

1:40 The Sample Rate Battle: Opposing Approaches as to Sample Rates When Digitizing Audio

*Arlen Card; Daniel Hatch*

2:00 Analyzing Differential Impact Text-Based Instructions in Video Games 🏆

*Rifat Ara Tasnim; Md Mosharaf Hossan; Farjana Eishita*

2:20 Archaeoastronomy at the Byzantine Church Complex at Horvat Beit Loya 🏆

*Brandon R Ro*

### **Computing: CS Education and Classroom Experience (Main 121)**

1:40 Coding Bootcamps: Employment Outcomes

*Logan L Hendricks; John M Edwards*

2:00 White-Label Bootcamps: Branding and Opinions

*Logan L Hendricks; John M Edwards*

2:20 Generative AI Adoption in Classroom in Context of Technology Acceptance Model (TAM) and the Innovation Diffusion Theory (IDT) 🏆

*Aashish Ghimire; John M Edwards*

2:40 Revisiting Plagiarism Deterrence in CS1 Through Keystroke Data  
*Caleb R Syndergaard; John M Edwards*

**3:00pm Break**

**3:20pm Paper session 3**

**Engineering: IoT and Machine Learning Applications (Main 326)**

3:20 The Impact of IoT on Customer Relationship Management: Opportunities and Challenges  
*Samaya Pillai; Nimisha Gupta; Pankaj Pathak*

3:40 Optimized Two-Stage Scheduling for Electric Vehicle Charging: A Machine Learning Approach  
*Abdullah Al Mehadi; Orion Watson; Abhilash Kamineni*

4:00 IoT Sensor Networks Optimization for Ultra-Low Latency in 6G URLLC Environment  
*Muhammad Nauman Irshad; Rardchawadee Ann; Imran A. Khoso; Tayyab Asad; Muhammad Ejaz*

4:20 ML-Based Real-Time Gesture Recognition Platform: Mouse Replacement as a Case-Study  
*Khaled Salah*

4:40 Machine Learning Analysis on Gunshot Recognition  
*Siddat B Nesar; Bradley M Whitaker; Robert Maher*

**Engineering: Advancements in Concrete Technology (Main 115)**

3:20 A Deep Learning Network for Classification and Visual Deterioration Detection of Concrete Surfaces  
*Deepanraj Balakrishnan; Hiren Mewada*

3:40 Understanding and Reducing Tire-Pavement Interface Noise  
*Mason R. K. Millard; W. Spencer Guthrie*

4:00 Advancing Understanding: Welded Wire Reinforcement Ductility in Concrete Structures  
*Alvaro E. Montes; Spencer B. Tanner; Taylor J. Sorensen*

4:20 Airtightness Performance of Thin-Shell Concrete Dome Structures  
*Eduardo Ibanez; Evan Bingham; Daira Sofia Velasco Vega; Andrew South*

4:40 Distress Surveys of Rapid-Setting Concrete Repairs in Pavement Panels and Bridge Decks

*Steven B Burdette; W. Spencer Guthrie; Robert J Stevens; Lorenzo A. Eusebi-Diehr*

### **Engineering: Control and Optimization Techniques (Main 119)**

3:20 Microphone Placement for Sparse 2D Beamforming Arrays

*Curtis Garner; Jonathan Blotter; Scott Sommerfeldt*

3:40 Velocity-Based Wind Turbine Blade Deblurring Using Richardson-Lucy Algorithm 🏆

*Bridger K Altice; Todd Moon; Mohammad Shekaramiz*

4:00 Automatic Regulation of Airspeed and Altitude of Aircraft Using LQR

*Anish Thapa; Marco P Schoen*

4:20 Power Flow Analysis Methods for Curved Shells 🏆

*Tysum R Ruchti; Jonathan Blotter*

4:40 Generalized Steady-State Behavior Model for DC Wind Turbine Power and Speed Control

*Dillon R Jensen; Joseph Hewett; Davi Cavinatto*

### **Computing: Data Science & Machine Learning (Main 121)**

3:20 Video Preprocessing for American Football Formation Recognition

*Kimi S Wright; Shad Torrie; Benjamin C Orr; Dah-Jye Lee*

3:40 Analyzing Gender Based-Variations in Visual Attention Patterns During Right Turn Maneuvers: Unsupervised Machine Learning Approach

*Arsenyan Ani; Zhanwen Liu; Chrispus Z Oroni*

4:00 Exploring Racial Bias in Deep Face Recognition Models

*Benjamin C Orr; Andrew W Sumsion; Shad Torrie; Dah-Jye Lee*

4:20 Tiered Object Detection in Underwater Environments

*David H Jensen; P. Flint Morgan; Bradley M Whitaker*

4:40 Autonomous Surveillance Breakthrough by Implementing Facial Recognition in Dog Robots

*Amir Hafezi; Minhaz Zibran; Taher Deemyad*

## Tuesday May 14

### 9:00 **Plenary and keynote (Main 121)**

**Adam Robertson**

**Co-founder and CTO, Fortem Technologies; Utah House of Representatives**



Mr. Robertson is a devoted husband and the proud father of eight children. He is the co-founder and CTO of Fortem Technologies, where he led the early development of the groundbreaking TrueView radar and DroneHunter products. His technical areas of expertise include millimeter wave electronics, compound semi-conductors, radar systems for drones, and avionics. His business areas of expertise include contract law, intellectual property, negotiation, international export, strategy, business development, and raising capital. He holds an MSEE and MBA from BYU and is the inventor on multiple patents. Mr. Robertson has served in the community as an elected official in the Utah House of Representatives and is currently serving on the Board of the Provo City Airport and as a high school mountain biking assistant coach.

### 10:00 **Break**

### 10:20 **Paper session 4**

#### **Engineering: Robotics and Automation II (Main 326)**

10:20 Utilizing Augmented Reality for Upper-Extremity Prosthesis Dimensioning  
*Jaden S Palmer; Kayson Oakey; Marco P Schoen; Nancy Devine*

10:40 Differentially Flat Model Predictive Trajectory Tracking for Mobile Robots  
*Justin Whitaker; Greg Droge*

11:00 Innovative Automatic Tool Changing Mechanism for Robotic Arms  
*Shaibal Das; Matthew Berry; Taher Deemyad*

11:20 Wind Turbine Classification for Autonomous Inspection: A Case Study Using Deep Learning  
*Zachary Ward; Austin Phillips; Cherif Seibi; Masoum Mohammad A. S.; Mohammad Shekaramiz; Abdennour Seibi*

11:40 Optimizing Structural Integrity: Stress Analysis of a Chassis Frame Using SolidWorks  
*Sara Sourani Yancheshmeh; Anish Sebastian; Taher Deemyad*

### **Engineering: Advanced Fabrication and Optical Devices (Main 115)**

10:20 Roughening of SU8 Waveguides to Accentuate Light Scattering

*James G Harkness; Aaron Hawkins; Holger Schmidt; Porter B Dixon; Anne E Lee; Md Nafiz Amin; Tyler Adams; Zoe Weber*

10:40 Fabricating Copper Probe Tips for Vertical Probe Card Using Electroplating and Photolithography 🏆

*Noah M Johnson; Dillon R Jensen; Alexander J Horspool; Stephen Schultz; Gregory Nielson*

11:00 DLD Particle Separation Device With Thin Top Membrane 🏆

*Tanner N Wells; Jesse X Wayment; Ephraim M Ong; Isadora C Hubner Cavinatto; Holger Schmidt; Aaron Hawkins*

11:20 Thin Membrane Hybrid Rib and Air Core ARROW Waveguides

*Seth Walker; Holger Schmidt; Aaron Hawkins*

11:40 Fabrication of High Density Flex Cables Using Direct Write Laser Ablation

*Joel G Kartchner; Bradley E Ferguson; Dillon R Jensen; Jared E Payne; Gregory Nielson; Stephen Schultz*

### **Engineering: Transportation and Infrastructure Studies (Main 119)**

10:20 Investigating Commuting Patterns of University Students in a High-Income Developing Country

*Khaled Shaaban*

10:40 The Water Quality Smart Monitor: A Cost-Conscious Approach for Personal Water Testing

*David Horne; Logan Stranc; Afsaneh Minaie*

11:00 Comparing Driver Behavior Across Road Sections With and Without Pedestrian Crossings in a Campus Environment

*Khaled Shaaban; Lindsay Helm; Payson Johnson; Erik Prazak; Day Rodriguez*

11:20 Effects of the Leaf Sheath on Stalk Strength in Maize

*Grant Ogilvie; Douglas Cook; Ryan Hall; Christian Shamo; Jacob Hall; Kenneth Smith; Carter Noh*

11:40 A Study on Current Travel Patterns and Anticipated Impacts of the Qatar Bahrain Causeway

*Khaled Shaaban*

## Computing: Wireless Network & Communication (Main 121)

10:20 A Multi-User Down-Link Non-Orthogonal Transmission Scheme for Enhanced Secrecy and Reliability in Next-Generation Wi-Fi Communication

*Muhammad Furqan Zia*

10:40 Quantum-Accelerated Nash Equilibrium Search for Optimal Relay Selection in Wireless Networks

*Tanner Kocher; Samuel Braude; Krishna Murthy Kattiyam Ramamoorthy*

11:00 Load Balanced Handover Planning for LEO Satellite Communication Networks 🏆

*Steven S. W. Lee; Geng-Li Zhou; Hua-Lung Tsai*

## 12:00 Lunch and poster session 2 (TSC, Sunburst Lounge)

Enhancing Efficiency: Isolation Ionic Conductivity Measurements for Solid Oxide Fuel Cells

*Jackson Hancey, Ty Parkinson, Christopher Nyborg, Dr. Oliver Johnson*

Evaluating Cyanobacteria and Cyanotoxins in Surface Water and Aerosols near Utah Lake

*Dylan McPeake, Sierra Young, Randal Martin, Joan McLean, Donald Olsen, Issac Orill*

Evaluating the Code Quality and Security of AI-Generated Python Code

*Md Fazle Rabbi, Md Fazle Rabbi, Arifa I. Champa, Minhaz F. Zibran*

Exploring Nash Equilibrium with Quantum Computers: Game Theory Advancements

*Sam Braude, Tanner Kocher*

Fractal Geometry in Architecture: Exploring Restorative Properties of Biophilic Design

*Jean-Claude Coomer, Brandon Ro*

High Temperature, High Purity Induction Furnace

*Ryan Weber, Oliver Johnson, Christopher Nyborg*

Improvement on the Wireless Fencing Scoring System with Capacitive Touch

*Victor Galayda, Andrew Butler*

Increasing Digital Accessibility for the Vision Impaired through an Economical Communication Solution

*Zachary Ward, Christian Poulsen*

Performance Guitar Pedal using Chorus Modulation Effect

*Colton Seegmiller, Afsaneh Minaie*



Real-time Gesture-Based Music Composition

*Brent Watson, Dylan de Hoyos*

Real-Time Pressure Map and Body Weight Measurement System

*Benjamin Heaton, Brayden Harding*

Recreating the Past: A Digital Exploration of the 6th Century Basilica at Horvat Beit Loya

*Joseph Laudie, Thomas Cryer, Brandon Ro*

Scaling Architectural Engagement: Analyzing Detail at Varying Scales

*Zachary Cooper, Brandon Ro*

Simulated G-force on a Human Body Via Encoded Motors Using Field Oriented Control

*Esteban Mendoza*

The Visual Attention of the Fractal Dimension

*Josh Lythgoe, Brandon Ro*

Using Open Source Software for Safe and Reliable Engineering

*Matt Thomas, Noah Boettcher*

Water Quality Monitoring

*David Horne, Logan Stranc, Afsaneh Minaie*

Wind Turbine Fault Localization Using Deep Learning

*Mason Davis, Edwin Nazario*

Wireless Charging Dock for Drones

*Brennen Barfuss, Lalle N'diaye*

Wireless Fencing with Smart Devices Using Capacitive Touch Sensors

*Andrew Butler, Victor Galayda, Afsaneh Minaie*

## 1:20pm **Paper session 5**

### **Engineering: Advanced Machine Learning Applications (Main 326)**

1:20 Integrating Satellite Imagery and Infield Sensors for Daily Spatial Plant Evapotranspiration Prediction: A Machine Learning-Driven Approach 🏆

*Farshina Nazrul Shimim; Ethan M. Glenn; Shilan Felehgari; Brett Griesbaum; John Fike; Bradley M Whitaker; Paul W Nugent*

1:40 Q-Learning Based Control for Swing-Up and Balancing of Inverted Pendulum

*Antora Dev; Marco P Schoen; Kanan Roy Chowdhury*

2:00 Wind Turbine Blade Fault Detection via Thermal Imaging Using Deep Learning  
*Benjamin Collier; Majid Memari; Mohammad Shekaramiz; Masoum Mohammad A. S.;  
Abdenmour Seibi*

2:20 Model-Based Reinforcement Learning With System Identification and Fuzzy Reward  
*Nusrat Farheen; Golam Gause Jaman; Marco P Schoen*

### **Engineering: Transportation Safety and Infrastructure (Main 115)**

1:20 Investigating Cyclist Injuries in Road Crashes  
*Khaled Shaaban; Abdelrahman Abouzaid*

1:40 Transit Stops in a Developing Country: Unraveling Challenges and Complexities  
*Khaled Shaaban*

2:00 Flashing Stop Signs Vs Traditional Stop Signs: An Investigation Into Driver Compliance at  
All-Way Stop-Controlled Intersections  
*Khaled Shaaban; Dustin Wall*

### **Engineering: Measurement and Sensing Technologies (Main 121)**

1:20 Particle Concentration and Flowrates Using Electroactuated Nanopumps 🏆  
*Wesley Z Collyer; Lars H Flores; Aaron Hawkins*

1:40 Charge Detection Mass Spectrometry (CDMS) of Microparticles 🏆  
*Eric Christie; Hyrum Jardine; Austin Barlow; Clayton Armstrong; Parker Allred; Yixin Song;  
Daniel Austin; Shiu-hua Wood Chiang; Aaron Hawkins*

2:00 Assessing LWIR and Visual Sensor Modalities for UAV Detection and Tracking  
*Emma Wadsworth; Jacob Brinton; Trevor C Vannoy; Bradley M Whitaker*

2:20 Fabrication of Tungsten Probe Tips on a Silicon Carbide Probe Card  
*Alexander J Horspool; Noah M Johnson; Ryan T Beazer*

**2:45pm Closing plenary and awards (Main 121)**

**3:00pm Aggie Ice Cream on the Quad**

## Nominees for best paper awards

AI-Powered Customized University and Career Guidance (Monday 11:00)

*Shadi Jawhar; Jeremy Miller; Zeina Bitar; Mohamad Jawhar*

Image Classification of Forest Fires Using Machine and Deep Learning (Monday 12:00)

*Mason Davis; Mohammad Shekaramiz*

Addressing the Challenge of Missing Medical Data in Healthcare Analytics: A Focus on Machine Learning Predictions for ICU Length of Stay (Monday 12:00)

*Mahmad Isaq Karankot; Max Marceau; Ethan M. Glenn; Rylan P Fowers; David Hedges; Bonnie Sheehey; Bradley M Whitaker*

Design and Kinematic Analysis of an Aerial Robotic Arm for Precision Agriculture (Monday 2:00)

*Kyler C. Bingham; Taher Deemyad*

Analyzing Differential Impact Text-Based Instructions in Video Games (Monday 2:00)

*Rifat Ara Tasnim; Md Mosharaf Hossan; Farjana Eishita*

Archaeoastronomy at the Byzantine Church Complex at Horvat Beit Loya (Monday 2:20)

*Brandon R Ro*

Generative AI Adoption in Classroom in Context of Technology Acceptance Model (TAM) and the Innovation Diffusion Theory (IDT) (Monday 2:20)

*Aashish Ghimire; John M Edwards*

Velocity-Based Wind Turbine Blade Deblurring Using Richardson-Lucy Algorithm (Monday 3:40)

*Bridger K Altice; Todd Moon; Mohammad Shekaramiz*

Power Flow Analysis Methods for Curved Shells (Monday 4:20)

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Fabricating Copper Probe Tips for Vertical Probe Card Using Electroplating and Photolithography (Tuesday 10:40)

*Noah M Johnson; Dillon R Jensen; Alexander J Horspool; Stephen Schultz; Gregory Nielson*

DLD Particle Separation Device With Thin Top Membrane (Tuesday 11:00)

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Load Balanced Handover Planning for LEO Satellite Communication Networks (Tuesday 11:00)

*Steven S. W. Lee; Geng-Li Zhou; Hua-Lung Tsai*

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