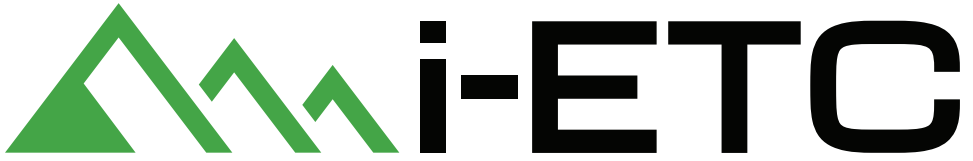


# i-ETC Conference 2025 Program



Intermountain Engineering, Technology and Computing Conference



**Innovations & Solutions for Today's Challenges**

**The 5th Intermountain Engineering, Technology and Computing Conference**

May 9-10, 2025 at Utah Valley University (UVU)

# Friday May 9th, 2025 i-ETC Schedule

Location UVU Computer Science Building

- 08:00-08:45**      **Registration/Breakfast - CS Atrium**
- 08:45-10:00**      **Opening - CS 404**  
**Keynote** - Manish Parashar, University of Utah  
Harnessing Responsible AI for Science Discovery, Innovation, and Impact
- 10:00-12:00**      **Conference Session 1**  
Rooms: CS 404 Engineering | CS 402 Technology | CS 403 Computing
- 12:00-01:30**      **Lunch/Posters - CS Atrium/Engineering Hallway**
- 01:30-03:30**      **Conference Session 2**  
Rooms: CS 404 Engineering | CS 402 Computing | CS 403 Computing
- 03:30-04:00**      **Break - CS Atrium**
- 04:00-06:00**      **Conference Session 3**  
Rooms: CS 404 & CS 402 Engineering | CS 403 & CS 411 Computing
- 06:00-07:00**      **Roots of Knowledge / UVU Tour**  
**Science Planetarium / UVU Tour**  
(Optional, in-person registration required on May 9 at registration desk)

# Saturday May 10th, 2025 i-ETC Schedule

Location UVU Computer Science Building

- 08:00-08:45**      **Breakfast**
- 08:45-09:45**      **Keynote** - Rohit Nair, PacifiCorp  
Powering the Future: Innovation at the Heart of the Energy Transition
- 09:45-10:00**      **Break**
- 10:00-12:00**      **Conference Session 4**  
Rooms: CS 404 & CS 402 Engineering | CS 403 Computing
- 12:00-01:15**      **Lunch/Posters - CS Atrium/Engineering Hallway**
- 01:15-02:15**      **Conference Session 5**  
Rooms: CS 404 & CS 402 Engineering | CS 403 & CS 411 Computing
- 02:15-02:45**      **Closing/Awards**



## 2025 Intermountain Engineering, Technology and Computing (i-ETC 2025)

Welcome to i-ETC 2025!

On behalf of the organizing committee, we extend a warm welcome to all attending the Fifth Intermountain Engineering, Technology and Computing Conference (i-ETC 2025, <https://i-etc.org>). The theme of the conference is Innovations & Solutions for Today's Challenges, focusing on the future path and new emerging solutions in engineering, computing and technology.

This year the i-ETC organizing committee received 100 paper submissions. All papers were reviewed by at least two independent peer reviewers and 78 papers were accepted to be presented and discussed in 17 oral sessions at the conference. All accepted and presented papers will be submitted for inclusion to the IEEE Xplore subject to meet the IEEE Xplore's scope and quality requirements. We will also have 35 posters presented in two poster sessions. Our sincere thanks go to all the reviewers for their time and effort in reviewing the papers.

For this year's conference with over 185 registered participants, we are very pleased to put forward two distinguished keynote speakers, Manish Parashar, Chief AI Officer, Director of the Scientific Computing and Imaging Institute, and Presidential Professor at University of Utah, and Rohit Nair, Director, Grid Modernization and Standards at PacifiCorp.

We would like to acknowledge technical support from IEEE, IEEE Utah Section, IEEE PES Utah chapter, IEEE-USA, Utah Valley University, Brigham Young University, Utah State University, Montana State University, Idaho State University, Weber State University, and University of Utah (UoU), Utah System of Higher Education (USHE), members of the I-ETC 2025 organizing committee, and the i-ETC 2025 technical review committee.

We would like to acknowledge financial support from Utah Valley University, Rocky Mountain Power, PacifiCorp, Utah Ready-Mixed Concrete Association, Advanced Technologies Consults, Ryse Energy, Keysight Technologies, Wavetronix, and Tektronix.

On behalf of the organizing committee let me welcome you all to i-ETC 2025, which is set to be a rewarding technical and social experience.

**Mohammad A.S. Masoum**

**General Chair, i-ETC 2025, <https://i-etc.org>**

# Sponsors

## Education Sponsors



## Industrial Sponsors



# i-ETC Committee

Committee members have worked hard to ensure the success of i-ETC and create a lasting impact that will inspire knowledge and innovation for generations to come.

## Executive Chairs



**Mohammad A.S. Masoum**  
General Chair (UVU)



**Spencer Guthrie**  
General Co-Chair &  
Engineering Track Co-Chair (BYU)



**John Edwards**  
General Co-Chair (USU)



**Stephen Schultz**  
Advisory Board &  
Engineering Track Co-Chair (BYU)



**Kelly Flanagan**  
Advisory Board (UVU)



**Neil Harrison**  
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## Program Chairs



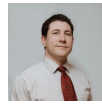
**Brad Whitaker**  
Publication Chair (MSU)



**Taher Deemyad**  
Engineering Track Chair (ISU)



**Jingpeng Tang**  
Computing Track Chair (UVU)



**David Grismann**  
Computing Track Chair (BYU)



**Rawan Al-Nsour**  
Technology Track Chair (UVU)



**Majid Memari**  
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**Dan Hatch**  
Web Chair (UVU)  
Conference MC



**Shelby Schaerrer**  
Web Intern (UVU)



**Dawn Stuver**  
Registration Chair (UVU)



**Masood Amin**  
Local Arrangement Chair (UVU)



**Afsaneh Minaie**  
Committee Member (UVU)



**Masood Parvania**  
Chair, IEEE Utah PES



**Shanker Shrestha**  
Chair, IEEE Utah



**Todd Palmer**  
Treasurer (UVU)



**Stefan Harlan**  
Sponsorship Chair and  
Industry Liaison (UVU)



**Rita Kuo**  
Committee Member (UVU)

# Friday May 9th, 2025 i-ETC Schedule

Location UVU Computer Science Building

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- 10:00-12:00**      **Conference Session 1**  
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- 03:30-04:00**      **Break - CS Atrium**
- 04:00-06:00**      **Conference Session 3**  
Rooms: CS 404 & CS 402 Engineering | CS 403 & CS 411 Computing
- 06:00-07:00**      **Roots of Knowledge / UVU Tour**  
**Science Planetarium / UVU Tour**  
(Optional, in-person registration required on May 9 at registration desk)

## Session 1A (Engineering)

Location CS 404, Friday, 10:00 am until 12:00 pm

Session Chair - Taher Deemyad

- 10:00 am: Damage to Epoxy Coating on Steel Reinforcement in Concrete Bridge Deck Construction**  
Alexis Post (Brigham Young University, USA); Mavrik Thomas (Brigham Young University, USA); Jared Baxter (Brigham Young University, USA); W. Spencer Guthrie (Brigham Young University, USA); Brian A Mazzeo (Brigham Young University, USA)
- 10:20 am: Non-Proprietary Ultra High Performance Concrete Mixture Design Using Response Surface Methodology**  
Md Abdullah Al Sarfin (Utah State University, USA); Srishti Banerji (Utah State University, USA); Andrew D. Sorensen (Texas A&M, USA)
- 10:40 am: Enhancing Soil-Concrete Interface Friction Using a Biomimetic Sawtooth Snakeskin Texture**  
Jenna Dayley (Brigham Young University, USA); Allison Kunz (Brigham Young University, USA); Kenneth Quintana (Brigham Young University, USA); Kyle Rollins (Brigham Young University, USA); Taylor J. Sorensen (Brigham Young University, USA)

**11:00 am: Within-Batch Variability in Stiffness of Rapid-Setting Concrete Produced Using a Volumetric Concrete Mixer**

Bryan Diego (Brigham Young University, USA); Steven B Burdette (Brigham Young University, USA); Matthew Christensen (Brigham Young University, USA); W. Spencer Guthrie (Brigham Young University, USA)

**11:20 am: Comparison of Springtime Modulus Values for Cement-Treated and Untreated Pavement Base Layers in Northern Utah**

Mason R. K. Millard (Brigham Young University, USA); W. Spencer Guthrie (Brigham Young University, USA)

**11:40 am: Sampling Guidelines for Measuring Cover Depth on New Concrete Bridge Decks Using a Rolling Cover Meter**

Jason T Richins (Brigham Young University & State of Utah, USA); Robert J Stevens (Infrastructure Research LLC, USA); W. Spencer Guthrie (Brigham Young University, USA)

## **Session 1B (Technology)**

Location CS 402, Friday, 10:00 am until 12:00 pm

Session Chair - Stephen McLaughlin, Ph.D

**10:00 am: Bridging Static and Dynamic Frontiers: a Systematic Review of Malware Detection Techniques**

Nicholas Addotey (Montana State University, USA); Fatima Rilwan Ododo (Montana State University, USA)

**10:20 am: Use of Google Gemini to Classify and Generate American and British Spelling Variants of Biomedical Terms**

Charles Paul Morrey (Utah Valley University, USA); Christopher G. Chute (Johns Hopkins University, USA)

**10:40 am: Gamified Virtual Reality Exposure Therapy for Mysophobia: Evaluating the Efficacy of a Simulated Sneeze Intervention**

Md Mosharaf Hossan (Idaho State University, USA); Rifat Ara Tasnim (Idaho State University, USA); Farjana Eishita (Idaho State University, USA)

**11:00 am: Digital Twins in the Ancient and Historical World**

Emily Hedrick (Utah Valley University, USA); Daniel Hatch (Utah Valley University, USA); Eric Oliver (Utah Valley University, USA)

**11:20 am: Analyzing the User Experience of Google Drive Storage Management with Alert Notification**

Aney Rani Paul (Idaho State University, USA); Md Mosharaf Hossan (Idaho State University, USA); Farjana Eishita (Idaho State University, USA)

## Session 1C (Computing)

Location CS 403, Friday, 10:00 am until 12:00 pm

Session Chair - Jingpeng Tang

### 10:00 am: Intelligent Meal Planning: a Generative LLM-Based Autonomous Agent Application

Ethan Howlett (Utah Valley University, USA); Joe Catlett (Utah Valley University, USA); Majid Memari (Utah Valley University, USA)

### 10:20 am: Tracking Variations in Pelican Horn Size Across the Breeding Season Using Deep Learning

Chhimi Sherpa (Westminster University, USA); Yuhao Xu (Westminster University, USA); Jingsai Liang (Westminster University, USA)

### 10:40 am: Scalable Algorithms for Uniform Max Size-Constrained Correlation Clustering

Nathan Corder (Utah Valley University, USA); George Kollios (Boston University, USA)

### 11:00 am: Intraday Stock Market Prediction Using a Machine Learning-Enhanced Moving Average Crossover Strategy

Mounica Kandula (Montclair State University, USA); Vaibhav Anu (Montclair State University, USA)

### 11:20 am: Machine Learning Classification of AI and Real Images

Joshua Hall (Utah Valley University, USA); Jingpeng Tang (Utah Valley University, USA); Ting Cao (Utah Valley University, USA)

### 11:40 am: Fake Image Detection Utilizing Transfer Learning-Based Vision Transformer

Aney Rani Paul (Idaho State University, USA); Farjana Eishita (Idaho State University, USA); Mostafa M Fouda (Idaho State University, USA)

## Lunch Break

Location Computer Science Atrium

12:00-13:30 Lunch/Posters in the Engineering Hallway

## Poster Presentations

Computer Science Building - Engineering Hallway

Poster Chair - Majid Memari

## Engineering Poster Track

### Desert Fire Detection Using YOLO Deep Learning Techniques

KristiAnne Duersch, & Sunshin Jo

### UVU Spectre Chess

Jade Stevens, & Nathan Archer

### Smart Chess

Kaden Clements, & Nathan Silva



### **Traffic Control Using Reinforcement Learning**

Benjamin Collier, & Tandon Belliston

### **Smart Book Scanner**

James Moos, & Dawson Ellis

### **Autonomous Medical Delivery/Emergency Notification Rover**

Joshua Barsdorf, & Christopher Huntington

### **Piezoelectric Energy Harvesting From Flow Induced Vibrations**

Joshua Gull, Bo Yu

### **Individualized Prosthesis Actuation Design using Adaptive Reinforcement Learning**

Christian Done, Kayson Oakey, Atulan Gupta, Janet Franklin, Sidney Hagedorn, & Marco Schoen

### **Phased Antenna Array**

Jacob Harms, & Dr. Waseem Sheikh

### **Self-Healing Potential of Quicklime-Based Concrete for Bridge Deck Durability Under Varied Conditions**

Srishti Banerji, & Robert J Thomas

### **Numerical Study on the Fire Performance of Polymer-Modified Concrete Beams**

Ahmed Almaadawy, & Srishti Banerji

### **Autonomous Precision Landing Drone**

Joseph Shipley, & Dallen Kever

### **Finding Young's Modulus of Contained Soil Samples Through Finite Element Analysis**

Bryan Diego, & Becky Stevens

### **Lehi City Storm Drain Analysis**

Isaac Dillman, Justin Zemp, & Jacob Waite

### **Design and fabrication of a flow system for flow cytometry via a custom benchtop imaging system**

Bryce Clawson, Marren Williams, & Vincent M. Rossi

### **Ultra-High-Performance Concrete for Compressed Air Energy Storage**

Greesh Nanda Vaidya, Arya Ebrahimpour, Bruce Savage, & Prateek Karna

### **Rocket Research Group**

Christopher Whatcott, Bijan Parvizi, Joshua Gull, JoEll Martin, & Morgan Judd

### **Smart Cornhole**

Jacob Eazarsky, & Christian Lewis

### **Ultra Digiscope Retrofit Kit**

Joshua Bradshaw, & William Spurlock

### **Rotating Solar Panel**

Zach Fisher, and Spencer Sheffield

### **EEG Smart Clothing**

Paden Memmott, & Garrett Rowley

### **Fire Detection and Location System**

Victory Odhiambo, & Terin Richardson,

### **Smart Communication Device for the Hard of Hearing: Sign Language Gloves**

Timothy Hansen, & Hector Petit,

### **Smart Baby Monitoring System**

Caleb Stephens, & Devyn Ritchey,

### **Interactive Projector**

Jared Simons

### **Innovations in Sanitization for 3D-Printed Parts in Medical and Critical Applications**

Israad Jaafar, Abdennour Seibi, & Masood Amin

### **Sound Analysis on UVU Pedestrian Bridge**

Patrick Bless, Abolfazl Amin, Bonnie Andersen, Brian Patchett, and Issac Settle

## **Technology Poster Track**

### **Photorealistic Recreation of the Beit Loya Basilica**

Benjamin Chandler, & Brandon Ro

### **Transitioning a CBT-Based Serious Game from Smartphone to Virtual Reality: A Pilot Study**

Rifat Ara Tasnim, & Farjana Eishita

### **Design Optimization and Improvement for Quantitative Phase Imaging Incubators**

Spencer Brown, & Dr. Vincent Rossi

### **Predicting Protein Function with Graph Neural Networks**

Xi Chen

### **Using Satellite Imagery to Monitor Algal Blooms in Utah Lake**

Vikram Athithan, Sowmya Selvarajan, Seunggyu Shin, and Weihong Wang

### **Portable Self-Playing Pipe Organ**

Josh Goates, Josh Houtz, Cameron McDougal, Gabe Patterson, Sam Davis, Truman Murray, Abolfazl Amin, and Abdennour Seibi

## **Computing Poster Track**

### **The Dark Side of Software Dependencies**

Costain Nachuma, Md. Mosharaf Hossan, Asif K. Turzo, & Minhaz F. Zibran

### **Exploring Maven Ecosystem Vulnerabilities and Delays**

Arifa I. Champa

### **Enhancing Phishing Awareness Through Visual Cues and Feedback-Based Learning**

Md Fazle Rabbi

### **Graph-Based Sensor Metadata Management for Advancing Exposure Health Research**

Sunho Im

## Robotic Airplane Tug Software System

Team Hammerhead: Jaden Hathaway, Jake Hathaway, Steven Mahlum, & Mackay Grange

## Development of a Smart parking system for outdoor parking lot occupancy detection

Patrick Fox, Pierce Anderson, & Samuel Elliott

## Session 2A (Engineering)

Location CS 404, Friday, 01:30 pm until 03:30 pm

Session Chair - Arya Ebrahimpour

### 01:30 pm: Ultra-High-Performance Concrete for Compressed Air Energy Storage

Greesh Vaidya (Idaho State University, USA); Arya Ebrahimpour (Idaho State University, USA); Bruce Savage (Idaho State University, USA); Prateek Karna (Idaho State University, USA)

### 01:50 pm: Acoustic Performance of Thin-Shell Concrete Domes and Wood-Framed, Modular Structures

Eduardo Ibanez (Brigham Young University, USA); Evan Bingham (Brigham Young University, USA); Andrew South (Brigham Young University, USA); Daira Sofia Velasco Vega (Brigham Young University, USA)

### 02:10 pm: Life Cycle Costs of the Little Cottonwood Canyon Transportation Scenarios Under Varied Economic Conditions and Analysis Periods

Emma Reeves (Brigham Young University, USA); Dane R Richards (Brigham Young University, USA); Darrell Sonntag (Brigham Young University, USA)

### 02:30 pm: Review of Thermal Efficiency Techniques in Cold-Formed Steel External Wall Systems

Ethan B. Pike (Brigham Young University, USA); Taylor J. Sorensen (Brigham Young University, USA)

### 02:50 pm: A Review of the Applications of Non-Proprietary Ultra High-Performance Concrete in U.S. Highway Bridges

Ali Shokrgozar (Tindall, USA); Dustin Taylor (Idaho State University, USA); Aryan Baibordy (Idaho State University, USA); Arya Ebrahimpour (Idaho State University, USA); Ahmed A. Ibrahim (University of Idaho, USA)

### 03:10 pm: A New Signalized Right-in/Right-Out Design to Enhance Traditional Intersections

Khaled Shaaban (Utah Valley University, USA); Ram Kumar (Westpac Group, Australia)

## Session 2B (Computing)

Location CS 402 Friday, 01:30 pm until 03:30 pm

Session Chair - Rita Kuo

### 01:30 pm: A Pedagogical Approach to Modeling Diffractive Phenomena via Discrete Implementation of the Huygens-Fresnel Principle

Vincent M Rossi (Utah Valley University, USA)

**01:50 pm: Implementation of an Educational Game to Teach the Digital File System**

Wesley M Camphouse (New Mexico Institute of Mining and Technology, USA); Rita Kuo (Utah Valley University, USA); Ramyaa Ramyaa (New Mexico Institute of Mining and Technology, USA)

**02:10 pm: Compilable States**

Sulove Bhattarai (Tribhuvan University, Nepal); John M Edwards (Utah State University, USA)

**02:30 pm: Computational Model of Fermat's Principle via Path Integration to Illustrate the Law of Reflection, Snell's Law and Dispersion in a Prism**

Vincent M Rossi (Utah Valley University, USA)

**02:50 pm: Exploring COVID-19's Impact on Computer Science Education Using Student Reviews**

Xi Chen (Utah Valley University, USA); Jingsai Liang (Westminster University, USA); Rita Kuo (Utah Valley University, USA); Jingpeng Tang (Utah Valley University, USA)

## Session 2C (Computing)

Location CS 403 Friday, 01:30 pm until 03:30 pm

Session Chair - David Grimsman

**01:30 pm: Analyzing AI Models on 3D Point Cloud Data**

Jordan L Reed (University of Idaho, USA); Justin Baldwin (University of Idaho, USA); John Shovic (University of Idaho, USA)

**01:50 pm: Win Dominance: a New Approach to Ranking Teams in Incomplete Tournaments**

Jesse N Melville (Brigham Young University, USA); David Grimsman (Brigham Young University, USA); Chris Archibald (Brigham Young University, USA)

**02:10 pm: The Role of AI in Transforming Education: a Systematic Review of Trends**

Eshita Zaman (Utah Valley University, USA); Qudrat E Alahy Ratul (Utah Valley University, USA); Saikat Das (Utah Valley University, USA); Majid Memari (Utah Valley University, USA)

**02:30 pm: Smart University Assistant: Leveraging Graph Databases and Vector Embeddings for Efficient Information Retrieval**

Dishank Inani (Utah Valley University, USA); Jingpeng Tang (Utah Valley University, USA); Rita Kuo (Utah Valley University, USA)

**02:50 pm: Analysis of Small Wind Turbine Inspection via Autonomous Drone**

Edward G Haymore (Utah Valley University, USA); Kale Guymon (Utah Valley University, USA); Ian Gotcher (Utah Valley University, USA); Mohammad A.S Masoum (Utah Valley University, USA); Farzad Ahmadi (Utah Valley University, USA)

## 30 Min Break

Location Computer Science Atrium

**03:30-04:00** Break

## Session 3A (Engineering)

Location CS 404, Friday, 04:00 pm until 06:00 pm

Session Chair - Farshina Nazrul Shimim

### 04:00 pm: Stress and Refractive Index of PECVD SiO<sub>2</sub> Films at Different Deposition Conditions

Edward A Marcos (Brigham Young University, USA); Isadora C Hubner Cavinatto (Brigham Young University, USA); Aaron R Hawkins (Brigham Young University, USA)

### 04:20 pm: Microfabrication on a Suspended Polymer

Tyler Adams (Brigham Young University, USA); Aaron R Hawkins (Brigham Young University, USA); Jordyn Palmer (Brigham Young University)

### 04:40 pm: Fabrication of a Silicon Carbide Probe Card with Through-Wafer Vias

Andrew W Hafener (Brigham Young University & Nielson Scientific, USA); Noah M Johnson (Brigham Young University, USA); Dillon R Jensen (Brigham Young University, USA); Gregory Nielson (Nielson Scientific, USA); Stephen Schultz (Brigham Young University, USA)

### 05:00 pm: Nanoscale Surface Roughening Using SU-8 Nano Grass as an Etch Mask

James G Harkness (Brigham Young University, USA); Anne E Lee (Brigham Young University, USA); Porter B Dixon (Brigham Young University, USA); Thomas D. Yuzvinsky (University of California Santa Cruz, USA); Holger Schmidt (UC Santa Cruz, USA); Aaron Hawkins (Brigham Young University, USA)

### 05:20 pm: An Experimental Wind Farm Emulator with a Dual Variable-Speed Drive Configuration

Noah Gruman (Oklahoma Gas and Electric Corp., USA); Paul Moses (University of Oklahoma, USA); Clemens Jauch (Flensburg University of Applied Sciences, Germany)

## Session 3B (Engineering)

Location CS 402, Friday, 04:00 pm until 06:00 pm

Session Chair - Stephen Schultz

### 04:00 pm: Analysis of Simulated Autonomous Wheelchair Driving Using GA-PID and RL Based Controllers

Atulan Gupta (Idaho State University, USA); Marco P Schoen (Idaho State University, USA)

### 04:20 pm: Measuring the Effects of the Leaf Blades and Leaf Sheaths on the Dynamic Behavior of Maize

Grant Ogilvie (Brigham Young University, USA); Douglas Cook (Brigham Young University, USA)

### 04:40 pm: Flipping the Switch: Leveraging Pinball Machines to Teach PLC Programming and Control Systems

James Lasso (University of Idaho, USA); Gary Banks (University of Idaho, USA); John Shovic (University of Idaho, USA); Kevin Wing (University of Idaho, USA); Tim Lybeck (University of Idaho, USA)

**05:00 pm: Maize Stalk Lodging: Quantitative and Qualitative Analysis of the Structural Failure Process**

Douglas Cook (Brigham Young University, USA); Addison McClure (Brigham Young University, USA); Luke Howell (Brigham Young University, USA); Alyson Burton (Brigham Young University, USA); Cole Dunn (Brigham Young University, USA); Andrew Tagg (Brigham Young University, USA)

**Session 3C (Computing)**

Location CS 403, Friday, 04:00 pm until 06:00 pm

Session Chair - Xi Chen

**04:00 pm: Direct Prediction of PM 2.5 from Raw Satellite Data**

Subhajit Chakrabarty (Louisiana State University Shreveport, USA); Mridula Mavuri (Louisiana State University Shreveport, USA); Udaysinh Rathod (Louisiana State University Shreveport, USA); Devesh Sarda (LSU Shreveport, USA); Tirthankar Chakraborty (Pacific Northwest National Laboratory, USA)

**04:20 pm: Leveraging Selected Lifestyle Factors from NHANES Data for Chronic Heart Disease Risk Prediction**

Sharmin Nahar (LSU Shreveport, USA); Zhonghui Wang (Louisiana State University in Shreveport, USA); Subhajit Chakrabarty (Louisiana State University Shreveport, USA); Xi Jin (LSU Shreveport, USA)

**04:40 pm: A New Data Driven Approach for Identifying Underserved Areas of Hospitals Accepting Medicare**

Subhajit Chakrabarty (Louisiana State University Shreveport, USA); Devesh Sarda (LSU Shreveport, USA); Udaysinh Rathod (Louisiana State University Shreveport, USA); Sweta Singh (LSU Shreveport, USA); Mridula Mavuri (Louisiana State University Shreveport, USA)

**05:00 pm: From Supercomputers to Desktops: an Interactive and Portable System for Particle in Cell Simulation and Visualization Using Commodity Hardware**

Kim Peterson (Utah State University, USA); Jess D Tate (University of Utah, USA); Steve Petruzza (Utah State University, USA)

**05:20 pm: Horizon Detection Hardware Accelerator for FPGA Based Space Computers**

Benjamin Macht (Montana State University, USA); Zachary Becker (Montana State University, USA); Lucas L Ritzdorf (University of Washington, USA); Mackenzie Smith (Montana State University, USA); Hezekiah Austin (Montana State University, USA); Christopher M Major (Montana State University, USA); Brock LaMeres (Montana State University, USA)

## Session 3D (Computing)

Location CS 411, Friday, 04:00 pm until 06:00 pm

Session Chair - Eshita Zaman

### **04:00 pm: Unsupervised Mapping of Quantitative Measures to Qualitative Characteristics in Hierarchical Software Quality Assurance**

Kaveen G Liyanage (Montana State University, USA); Ethan Gerard (Montana State University, USA); Derek Reimanis (Gianforte School of Computing, Montana State University, USA); Ann Marie Reinhold (Montana State University, USA); Clemente Izurieta (Montana State University, USA); Brock LaMeres (Montana State University, USA); Bradley M Whitaker (Montana State University, USA)

### **04:20 pm: SPADE: a Library for Programmatic Parsing and Verification of Discrete Data Structures**

Russell B Phillips (Idaho State University, USA); Paul Bodily (Idaho State University, USA)

### **04:40 pm: Performance Behavior Parameters, Visualization of Computing Resources, and Testing Performance in Cloud Computing**

Surakshya Jaishi (University of Central Lancashire, United Kingdom (Great Britain))

### **05:00 pm: Development of a User-Focused Hexahedral Meshing Software for Swept Surfaces**

Hayden E Emmertson (Brigham Young University, USA); Kendrick M Shepherd (Brigham Young University, USA); Caleb B. Goates (Brigham Young University, USA)

### **05:20 pm: Efficient Bangla OCR via Sequence-Level Knowledge Distillation**

Md Tareq Mahmud (LSU Shreveport, USA); Nafis Iqbal (North South University, Bangladesh); Shayam Imtiaz Shuvo (North South University, Bangladesh); Qingsong Zhao (LSU Shreveport, USA); Subhajit Chakrabarty (Louisiana State University Shreveport, USA)

## Optional UVU Tours

(Optional, in-person registration required on May 9 at registration desk)

**6:00-7:00 Roots of Knowledge / UVU Tour**  
**Science Planetarium / UVU Tour**

# Saturday May 10th, 2025 i-ETC Schedule

Location UVU Computer Science Building

- 08:00-08:45**      **Breakfast - CS Atrium**
- 08:45-09:45**      **Keynote - Rohit Nair, PacifiCorp - CS 404**  
Powering the Future: Innovation at the Heart of the Energy Transition
- 09:45-10:00**      **Break - CS Atrium**
- 10:00-12:00**      **Conference Session 4**  
Rooms: CS 404 & CS 402 Engineering | CS 403 Computing
- 12:00-01:15**      **Lunch/Posters - CS Atrium/Engineering Hallway**
- 01:15-02:15**      **Conference Session 5**  
Rooms: CS 404 & CS 402 Engineering | CS 403 & CS 411 Computing
- 02:15-02:45**      **Closing/Awards - CS 404**

## Session 4A (Engineering)

Location CS 404, Saturday, 10:00 am until 12:00 pm

Session Chair - Stephen Schultz

### **10:00 am: SoK: Trusted Execution in SoC-FPGAs**

Garrett R Perkins (Montana State University, USA); Benjamin Macht (Montana State University, USA); Lucas L Ritzdorf (University of Washington, USA); Tristan Running Crane (Montana State University, USA); Brock LaMeres (Montana State University, USA); Clemente Izurieta (Montana State University, USA); Ann Marie Reinhold (Montana State University, USA)

### **10:20 am: On Coherent Detection of PCM/FM in Aeronautical Mobile Telemetry**

Michael Rice (Brigham Young University, USA); Zach Hilton (Brigham Young University, USA)

### **10:40 am: Estimating Damping and Frequency-Dependent Wave Velocity Using Arrays of Seismic Sensors**

Todd K Moon (Utah State University, USA)

### **11:00 am: Supervised Machine Learning for Modbus Communication Protocol Decoding**

Skyler Reid (Montana State University, USA); Maximus Marceau (Montana State University, USA); Keith M Filler (Montana State University, USA); Keith Mecham (Idaho National Lab, USA); Bradley M Whitaker (Montana State University, USA)

### **11:20 am: The Role of Artificial Intelligence in Transforming VLSI Design, Testing, and Manufacturing**

Antora Dev (Idaho State University, USA); Mostafa M Fouda (Idaho State University, USA); Steve Chiu (Idaho State University, USA)



### **11:40 am: Full-Duplex Gigabit Ethernet Signal Separation Using LSTM**

Keith M Filler (Montana State University, USA); Maximus Marceau (Montana State University, USA); Skyler Reid (Montana State University, USA); Stephen Ude (Idaho National Lab, USA); Noah Netz (Idaho National Lab, USA); Keith Mecham (Idaho National Lab, USA); Bradley M Whitaker (Montana State University, USA)

## **Session 4B (Engineering)**

Location CS 402, Saturday, 10:00 am until 12:00 pm

Session Chair - JJ Liu

### **10:00 am: Passive RF Smart Contact Lens for Accurate and Low-Power Eye Tracking**

Blake P Crosby (Brigham Young University, USA); Ethan W Graham (Brigham Young University & Nielson Scientific, USA); Stephen Schultz (Brigham Young University, USA); Gregory Nielson (Nielson Scientific, USA)

### **10:20 am: Multiple Moving Object Detection and Tracking Across Complex Terrain and Skylines**

Jen-Jui Liu (Brigham Young University, USA); Randy Beard (Brigham Young University, USA)

### **10:40 am: An Analysis of Wave Propagation Through Snow Packs for Remote Sensing Applications**

Trevor T Wiseman (Brigham Young University, USA)

### **11:00 am: Creating Industry Relevant Experiences for Undergraduates via Laser Design, Construction, and Optimization**

York E. Young (Utah Valley University, USA)

### **11:20 am: Low-Power Pupil Dilation Sensing Using a Passive Smart Contact Lens**

Ethan W Graham (Brigham Young University & Nielson Scientific, USA); Blake P Crosby (Brigham Young University, USA); Joel G Kartchner (Brigham Young University, USA); Stephen Schultz (Brigham Young University, USA); Gregory Nielson (Nielson Scientific, USA)

### **11:40 am: UAV Propeller Frequency and Angle Analysis Using Lidar and Sliding Windows**

Zachary L Crennen (Los Alamos National Laboratory & Montana State University, USA); Trevor C Vannoy (Montana State University, USA); Wyatt Weller (Montana State University, USA); Riana Chatterjee (Arizona State University, USA); Joseph A Shaw (Montana State University, USA); Bradley M Whitaker (Montana State University, USA)

## **Session 4C (Computing)**

Location CS 403 Saturday, 10:00 am until 12:00 pm

Session Chair - Ting Cao

### **10:00 am: AURANET: Recurrent Alternate Update Training for Spatiotemporal Prediction with Incomplete Observations**

Farshina Nazrul Shimim (Montana State University, USA); Shilan Felehgari (Montana State University, USA); Brett Griesbaum (Montana State University, USA); Bradley M Whitaker (Montana State University, USA); Paul W Nugent (Montana State University, USA)

**10:20 am: Predicting Heat of Combustion from SMILES with Machine Learning**  
Braden Garrett (Utah Valley University, USA); Jingpeng Tang (Utah Valley University, USA); Xi Chen (Utah Valley University, USA)

**10:40 am: Classification of Right Hemisphere Damage Using MFCC Paralinguistic Voice Features**  
Visar Rraci (LSU Shreveport, USA); Landrum Anderson (LSU Shreveport, USA); Subhajit Chakrabarty (Louisiana State University Shreveport, USA)

**11:00 am: Simulated Object Detection in Underwater Environments**  
P. Flint Morgan (Montana State University, USA); Liam G. White (Montana State University, USA); David H Jensen (Montana State University, USA); Bradley M Whitaker (Montana State University, USA)

## Lunch Break

Location Computer Science Atrium  
Poster Chair - Majid Memari

**12:00-13:15 Lunch/Posters in the Engineering Hallway**

## Session 5A (Engineering)

Location CS 404, Saturday, 01:15 pm until 02:15 pm  
Session Chair - James Harkness

**01:15 pm: Wrapping a Pattern to Scanned Curved Surfaces for Ablation**  
Jonathan P Wright (Utah State University & Brigham Young University, USA); Christopher A Chinh (Brigham Young University & Nielson Scientific, LLC, USA); Bradley E Ferguson (Brigham Young University & Nielson Scientific, USA); Gregory Nielson (Nielson Scientific, USA); Stephen Schultz (Brigham Young University, USA)

**01:35 pm: Software Surface Tracking of Curved Surfaces to Facilitate Laser Nano-Ablation**  
Christopher A Chinh (Brigham Young University & Nielson Scientific, LLC, USA); Bradley E Ferguson (Brigham Young University & Nielson Scientific, USA); Stephen Schultz (Brigham Young University, USA); Gregory Nielson (Nielson Scientific, USA)

## Session 5B (Engineering)

Location CS 402, Saturday, 01:15 pm until 02:15 pm  
Session Chair - Khadijeh Bazargani

**01:15 pm: A Low-Cost, Scriptable, Microcontroller-Based Voltage Driver for Digital Electro-Optic Modulator Polarization Control**  
Nicholas R Townsend (Brigham Young University, USA); Ryan Camacho (Brigham Young University, USA)

**01:35 pm: A Simple Method to Measure and Correct the Size-of-Source Effect of Infrared Thermometers Using the Emissivity Setting**  
Travis J Moore (Utah Valley University, USA)

## Session 5C (Computing)

Location CS 403, Saturday, 01:15 pm until 02:15 pm

Session Chair - Imtiaz Parvez

### 01:15 pm: Raspberry Pi: AWS Automated Smart Greenhouse

Brek'n Shumway (Utah Valley University, USA); Sayeed Sajal (Utah Valley University, USA)

### 01:35 pm: Using Android to Showcase Arduino as a Powerful IOT Device

Carston Dastrup (Utah Valley University, USA); Sayeed Sajal (Utah Valley University, USA)

### 01:55 pm: Security Enhancement on Network Access Control (NAC)

Jeanlin Kalonji (Utah Valley University, USA); Sayeed Sajal (Utah Valley University, USA)

## Session 5D (Computing & Technology)

Location CS 411, Saturday, 01:15 pm until 02:15 pm

Session Chair - Jingsai Liang

### 01:15 pm: Is Artificial Intelligence the Answer to Everything?

Neil B Harrison (Utah Valley University, USA); George L Rudolph (Utah Valley University, USA); Peter Aldous (Utah Valley University, USA)

### 01:35 pm: Automated Techniques for Prediction and Classification of Technology Addiction: a Review

Ashley Etheridge (Montclair State University, USA); Vaibhav Anu (Montclair State University, USA)

### 01:55 pm: Verification Tool for Securing RISC-V FPGA-Based Process Control System

Christine L Johnson (Montana State University & Software Engineering and Cybersecurity Laboratory, USA); Ann Marie Reinhold (Montana State University, USA); Clemente Izurieta (Montana State University, USA); Bradley M Whitaker (Montana State University, USA); Brock LaMeres (Montana State University, USA)

## i-ETC Closing & Awards

Location CS 404

02:15-02:45 Closing/Awards

