Illinois Scholars Undergraduate Research (ISUR) Program Research Expo
Thursday, April 21, 4:00 PM – 6:00 PM
Illini Union Rooms A, B, and C

The Grainger College of Engineering Illinois Scholars Undergraduate Research (ISUR) Program Research Expo showcases the various science and engineering projects our scholars and their mentors have been working on this year. ISUR is a two-semester, structured, mentored research experience for undergraduate students in science and engineering. Through the learning-by-apprenticeship model, students learn about the research process, develop their research and technical communication skills, and gain experience needed for graduate school acceptance or research in industry.

Under the ISUR umbrella are the following programs: Clare Boothe Luce Research Program, DaRin Butz Foundation Research Program, Semiconductor Research Corporation Undergraduate Research Program, and C3SR-Undergraduate Research in Artificial Intelligence. This year, we also have presentations from ROTC students in the Accelerated Learning and Engineering Research Training (ALERT) Program in Electronic and Cyber Security.

ISUR Scholars

Study of Liver Progenitor Cells Through Changes in Micropatterning
Ayusha Acharya (ADM Scholar), Senior, Bioengineering, Grainger College of Engineering

Multimodal Imaging of Peripheral Arterial Disease Comorbid with Type 2 Diabetes
Yamenah Ambreen, Senior, Bioengineering, Grainger College of Engineering

Biomaterials to Investigate Pathophysiological Mechanisms of Glioblastoma Invasion and Chemotherapeutic Resistance
Joseph Boyce, Senior, Materials Science and Engineering, Grainger College of Engineering

Label-Free Tissue Histopathology Using Infrared Spectroscopic Imaging
Jaime Chen, Senior, Bioengineering, Grainger College of Engineering

A 3D Tissue Engineering Model of Endometrial Vessel Networks
Noah Chiou, Junior, Bioengineering, Grainger College of Engineering

A Model of HIV Latency in Monocytes Reveals Monocyte to Macrophage Differentiation Increases Latency Reactivation
Rob Coronado, Senior, Bioengineering, Grainger College of Engineering

Full State Estimation of a Ballbot Using a Contactless Optical Flow Sensor
Skyler Do, Senior, Systems Engineering, Grainger College of Engineering

Aluminum Plate-Based Tensegrity Structures
Christina Garcia, Junior, Civil and Environmental Engineering, Grainger College of Engineering

Optimization and Evaluation of 3D Bioprinter
Lauren Krause, Junior, Bioengineering, Grainger College of Engineering

Development of a Planar Inverted Pendulum Testbed

David Lam, Senior, Mechanical Engineering, Grainger College of Engineering

The Virtual Reality Method on Analyzing Extinction-Based Classical Conditioning Learning

Beulah Lee, Junior, Computer Engineering, Grainger College of Engineering

Inferring Regulatory Motifs from Fungal Genomic Sequences

Simon Liu, Junior, Computer Science, Grainger College of Engineering

Tuning the Topology of Substrates for Coral Larval Recruitment

Eliza Lovrich, Junior, Bioengineering, Grainger College of Engineering

Investigation of the Synthesis of YSZ Aerogels Using Crystalline Precursors

Jordan Meyer, Senior, Materials Science and Engineering, Grainger College of Engineering

A Graphical User Interface for Rapid Prototyping of Imaging Phantoms for Nuclear Medicine Applications

Emma Morano, Sophomore, Nuclear, Plasma, and Radiological Engineering, Grainger College of Engineering

Biomaterial-Based Tumor Models to Analyze the Role of Glioma Extracellular Matrix in Therapeutic Efficacy

Edward Neves, Senior, Chemical Engineering, LAS

Determining the Effects of Mesenchymal Stromal Cell Matrix Remodeling on Hematopoietic Stem Cell Maintenance

Alison Nunes (ADM Scholar), Senior, Materials Science and Engineering, Grainger College of Engineering

Metabolomic and Lipidomic Analysis of Metastatic Castration Resistant Prostate Cancer Plasma

Ege Gungor Onal, Senior, Bioengineering, Grainger College of Engineering

Understanding the Impact of Fluid Flow on Liver Sinusoidal Endothelial Cells in Conjunction with Human Stellate Cells

Danny Owen, Senior, Bioengineering, Grainger College of Engineering

Highly Efficient High Harmonic Generation in a Hollow-Core Fiber from a Ytterbium Laser

Sahaj Patel, Junior, Physics, Grainger College of Engineering

Investigating the Effect of Mineralized Collagen Scaffolds on the Immunomodulatory Capacity of Human Mesenchymal Stem Cells

Maxwell Polanek, Junior, Chemical Engineering, LAS

Central Illinois Intercropping: Intersection between Ancient Agriculture and Midwestern Prairie Restoration

Daniela Pope (ADM Scholar), Senior, Agricultural and Biological Engineering, Grainger College of Engineering

Electrical Detection of Dopamine Using a Graphene-Field Effect Transistor
Malaak Saadah, Senior, Materials Science and Engineering, Grainger College of Engineering

Design of A Textile Sensor Embedded Shirt for Posture Monitoring
Drashti Sikligar, Senior, Bioengineering, Grainger College of Engineering

Design, Development, and Testing of a Microfluidic Phantom Setup for a Preclinical Nuclear Imaging System
Lisa Silverstein, Sophomore, Nuclear, Plasma, and Radiological Engineering, Grainger College of Engineering

Investigation of Ionic Conductivity in Mixed Conducting Perovskite Oxide Thin Films during Crystallization
Joshua Simpson-Gomez, Senior, Materials Science and Engineering, Grainger College of Engineering

Kinetic Modeling of CO2 Electroreduction on Silver Nanoparticles
Sujay Someshwar, Senior, Chemical Engineering, LAS

The Surface Energy of Chemically and Physically Functionalized Graphene
Jules Suarez, Senior, Mechanical Engineering, Grainger College of Engineering

Noisy Policies for Visual Embodied Navigation
Nikash Walia, Junior, Computer Science, Grainger College of Engineering

Ultrasonic Measurements of Binderjet Additively Manufactured Parts
Madison Yang, Junior, Mechanical Engineering, Grainger College of Engineering

Electrodeposition of Si Anodes for Li-ion Batteries
Muhemmad Yåçîn, Senior, Materials Science and Engineering, Grainger College of Engineering

Clare Boothe Luce Research Scholars

Study of Liver Progenitor Cells Through Changes in Micropatterning
Madeline Blaauw, Senior, Bioengineering, Grainger College of Engineering

CO2 Electroreduction Catalyzed by Intermetallic Gold-Copper Nanoparticles
Maya Chattoraj, Senior, Chemistry, LAS

Comparative Investigation of a Continuous DC Plasma Electrode Against Boron-doped Diamond during PFAS Degradation
Jasmine Dinari, Junior, Nuclear, Plasma, and Radiological Engineering, Grainger College of Engineering

Engineering Commensal Microbes for Optimized Therapeutic Delivery to the Gut
Shweta Khorana, Senior, Bioengineering, Grainger College of Engineering

Interrogating the Metal/Acid Site Balance in Bifunctional Catalysts Toward Oxygenate Upgrading
Melissa Manetsch, Senior, Chemical Engineering, LAS

Dual Role of Strigolactone Signaling Partner in Inhibiting Substrate Hydrolysis
Briana Sobecks, Senior, Chemical Engineering, LAS

Hierarchical Planning with Annotated Skeleton Guidance
Ananya Yammanuru, Senior, Computer Science, Grainger College of Engineering

Oxidation and Crystallization Behavior of Ternary Aluminum Diborides
Dana Yun, Senior, Materials Science and Engineering, Grainger College of Engineering

DaRin Butz Foundation Research Scholars

Investigation of the Gas Phase of a Plasma-Water Interface
Elizabeth Perez, Senior, Physics, LAS

Development and Evaluation of Biopolymer Robotic Actuators for Healthcare Applications
Adia Radecka, Junior, Electrical Engineering, Grainger College of Engineering

Development of Capacitance-Voltage Measurement Method for Non-Uniform Dopant Profiling in III-V Solar Cells
Karen Yang, Senior, Materials Science and Engineering, Grainger College of Engineering

Semiconductor Research Corporation – Undergraduate Research Program

Optimizing Nanoparticles Using Microfluidic Instruments
Nathaniel Anderson (Siemens EDA Scholar), Junior, Materials Science and Engineering, Grainger College of Engineering

Antimicrobial Peptides: The New Generation of Antibiotics to Create a World Free of Cancer and Bacteria
Juan David Campolargo (IBM Scholar), Sophomore, Undeclared, DGS

Evaluation of Novel Halide-Based Solid-State Electrolytes for Lithium-Ion Battery Systems
Daniel Cudzich (TI Scholar), Sophomore, Materials Science and Engineering, Grainger College of Engineering

HOPPY: An Open-source Kit for Education with Dynamic Legged Robots
Michaela Horn (Intel Scholar), Junior, Computer Science, Grainger College of Engineering

Using Computer Vision to Relieve the Crop Phenotyping Bottleneck
Liana Koleva (IBM Scholar), Senior, Computer Engineering, Grainger College of Engineering

Fabrication and Testing of Metamorphic $In_{0.63}Ga_{0.37}P$ Solar Cells
Amanda Loutris (Intel Scholar), Senior, Materials Science and Engineering, Grainger College of Engineering

Exploration of a Stand-Alone PV System and Implementation of FarmBot

Daniel Moreno (Intel Scholar), Senior, Systems Engineering and Design, Grainger College of Engineering

Teaching Electromagnetism through 3D VR Immersion

Savannah Pagan (TI Scholar), Sophomore, Electrical Engineering, Grainger College of Engineering

Instability-Induced Pattern Formation for Functional Materials

Anisha Sharma (Intel Scholar), Junior, Materials Science and Engineering, Grainger College of Engineering

Full State Estimation of a Ballbot Using a Contactless Optical Flow Sensor

Piyush Sud (Siemens EDA Scholar), Senior, Computer Engineering, Grainger College of Engineering

Conformationally Switchable Copper Complexes

Claire Zimmerman (Siemens EDA Scholar), Senior, Chemistry, LAS

C3SR – Undergraduate Research in Artificial Intelligence

Parallelizing the Sparsification of Matrices and Hypergraphs

Manav Agrawal, Senior, Computer Engineering, Grainger College of Engineering

Living Dictionary: Automatically Generating Wikipedia-like Content from Keywords

Nishant Balepur, Junior, Computer Science, Grainger College of Engineering

Towards a Lab Test Results Advisor

Zach Cacini, Junior, Bioengineering, Grainger College of Engineering

Adversarial Learning on Federated Models

Anusha Ghosh, Sophomore, Computer Science, Grainger College of Engineering

The Information Forest: Context and Connections

Matthew Jin, Junior, Computer Engineering, Grainger College of Engineering
Jacob Levine, Sophomore, Computer Science, Grainger College of Engineering
Chirag Rastogi, Junior, Computer Engineering, Grainger College of Engineering

Text-Based Models for Federated Learning and Adversarial Training

Suchita Joshi, Junior, Computer Science, LAS

Generating Large Synthetic and Real Graph Datasets

Arpandeep Khatua, Junior, Computer Engineering, Grainger College of Engineering

7IBM Analog AI Hardware Acceleration Kit

Joseph Rejive, Junior, Computer Engineering, Grainger College of Engineering

Stereotype Bias Mitigation in Masked Language Models with Few-shot Learning
Emily Sallenback, Junior, Computer Science, Grainger College of Engineering

The "Living" Encyclopedia
Sanjana Sarkar, Senior, Computer Science, Grainger College of Engineering

Ranking Different Concepts in MOOCs
Taksh Singh, Junior, Computer Science, Grainger College of Engineering

Interactive Aspect-Based Information Retrieval System for IT Tickets
Victor Szabo, Junior, Computer Science, Grainger College of Engineering

Methodology for Compressing Multilingual Transformer
Heyi Tao, Senior, Computer Engineering, Grainger College of Engineering

Federated Machine Unlearning
Rem Yang, Junior, Computer Science, Grainger College of Engineering

IBM Analog Hardware Acceleration Kit
Bowen Xiao, Senior, Electrical Engineering, Grainger College of Engineering

Accelerated Learning and Engineering Research Training (ALERT) in Electronic and Cyber Security

Detecting Anomalous Behaviors for Assured Command and Control
Benjamin Candee, Senior, Mathematics, LAS
Luke Lalumandier, Senior, Aerospace Engineering, Grainger College of Engineering

Reconfigurable Antenna System to Detect and Mitigate GPS Spoofing/Jamming
Josh Carpenter, Senior, Mechanical Engineering, Grainger College of Engineering
Adam Spitzner, Junior, Systems Engineering, Grainger College of Engineering

Stretchable Wrinkled WSe_2 for Tunable Single Photon Emitters
Henry Feldhaus, Senior, Mechanical Engineering, Grainger College of Engineering
Mary Pelzer, Junior, Mechanical Engineering, Grainger College of Engineering

Machine-Learning Based Anomaly Detection and Resiliency for Autonomous UUV Swarms
Riley Hudson, Senior, Systems Engineering and Design, Grainger College of Engineering
Neel Khattri, Junior, Computer Engineering, Grainger College of Engineering

Trustworthy Machine Learning - Image Classification
Jisu Kim, Junior, Mechanical Engineering, Grainger College of Engineering

Autoencoder Based IDS
Krishna Vasudev, Sophomore, Physics, LAS

Next Generation Power Electronics
Samuel Weiss, Junior, Systems Engineering, Grainger College of Engineering

Small Array Behavior on Portable/Mobile Platforms

Patrick Yim, Senior, Mechanical Engineering, Grainger College of Engineering