POSTER LISTINGS FOR THE 2023 ENGINEERING GRADUATE RESEARCH SYMPOSIUM
POSTER SESSION 1
POSTER GROUP A
9:30AM - 11:00AM
2300 HALLWAY AND 2400 HALLWAY
Poster Number: S1-A1  
Authors: Jaewon Han; Annick Anctil  
Title: THE LIFE CYCLE ASSESSMENT OF PLASTIC CHEMICAL UPCYCLING  
Advisor: Annick Anctil  
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
Keywords: LIFE CYCLE ASSESSMENT, PLASTIC RECYCLING, CHEMICAL UPCYCLING

Poster Number: S1-A2  
Authors: Siddhant Gautam; Saiprasad Ravishankar  
Title: ADAPTIVE SAMPLING FOR DYNAMIC MR IMAGING  
Advisor: Saiprasad Ravishankar  
Research Category: HEALTH AND BIOMEDICAL  
Keywords: MACHINE LEARNING, SIGNAL PROCESSING, DEEP LEARNING

Poster Number: S1-A3  
Authors: Tyler Stump; Julie Celini; Michael Kaven; Yunxiu Qiu; Bin Wen; Kirk Dolan  
Title: PARAMETER ESTIMATIONS FOR PREDICTIVE INACTIVATION MODELING OF SALMONELLA  
Advisor: Jade Mitchell  
Research Category: HEALTH AND BIOMEDICAL  
Keywords: ESTIMATION, PARAMETER, MODELING

Poster Number: S1-A4  
Authors: Brandon Howard; John Dorgan; Scott Calabrese Barton  
Title: GREEN PE UPCYCLING USING ACID ONLY ACTIVATION  
Advisor: Scott Calabrese Barton  
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
Keywords: POLYETHYLENE, SULFONATION, DEPOLYMERIZATION  
This work is supported by the Department of Energy award to the REMADE Institute.

Poster Number: S1-A5  
Authors: Saima Alam; Norbert Mueller  
Title: NUMERICAL MODELING OF THERMAL EXPANSION VALVE REMOTE SENSING BULB  
Advisor: Norbert Mueller  
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
Keywords: HEAT PUMP, THERMAL EXPANSION VALVE, VAPOR COMPRESSION CYCLE  
This work is supported by the Ford Motor Company.
Poster Number: S1-A6
Authors: Ceren Aydin; Mustafa Hatipoglu; Bora Cetin; Halil Ceylan
Title: DETERMINATION OF CROSS-ANISOTROPY RATIOS FOR THE RESILIENT MODULUS OF IOWA SOILS AND GEOMATERIALS
Advisor: Bora Cetin
Research Category: MATERIALS, MECHANICS AND ADVANCED MANUFACTURING
Keywords: PAVEMENT FOUNDATION LAYERS, RESILIENT MODULUS, CROSS-ANISOTROPY
This work is supported by the Iowa Highway Research Board (IHRB).

Poster Number: S1-A7
Authors: Oyendrila Dobe; Borzoo Bonakdarpour; Stefan Schuup; Axel Legay; Ezio Bartocci; Miroslav Pajic; Yu Wang
Title: STATISTICAL MODEL CHECKING OF LINEAR TIME HYPERPROPERTIES
Advisor: Borzoo Bonakdarpour
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: INFORMATION FLOW CONTROL, HYPERPROPERTIES, FORMAL VERIFICATION
This work is supported by the NSF SaTC Award 2100989.

Poster Number: S1-A8
Authors: Qasim Zulfiqar; Syed Waqar Haider; Bora Cetin; Haluk Sinan Coban
Title: STRESS STATE ANALYSIS OF RECYCLED AGGREGATE BASE USING FWD DATA
Advisor: Syed Waqar Haider
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: PAVEMENTS, STRESS STATE, RECYCLED AGGREGATE BASE

Poster Number: S1-A9
Authors: Aochuan Chen; Sijia Liu
Title: UNDERSTANDING AND IMPROVING VISUAL PROMPTING: A LABEL-MAPPING PERSPECTIVE
Advisor: Sijia Liu
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: VISUAL PROMPTING, LABEL MAPPING, TRANSFER LEARNING

Poster Number: S1-A10
Authors: Manoj Madhavan; Ripla Arora
Title: ABERRANT UTERINE FOLDING DISRUPTS EMBRYO-UTERINE AXIS ALIGNMENT AND CHAMBER FORMATION
Advisor: Ripla Arora
Research Category: HEALTH AND BIOMEDICAL
Keywords: WOMEN'S HEALTH, UTERUS, IMPLANTATION
This work is supported by the NIH R01 grant #1R01HD109152.
Poster Number: S1-A11
Authors: Chuwei Ye; Shaoting Lin
Title: STRAIN-PROGRAMMABLE HOPPING DIFFUSION IN HYDROGELS
Advisor: Shaoting Lin
Research Category: MATERIALS, MECHANICS AND ADVANCED MANUFACTURING
Keywords: HYDROGEL, STRAIN, HOPPING DIFFUSION

Poster Number: S1-A12
Authors: Anthony James Franco; Evangelyn Alocilja
Title: WHERE DOES SALMONELLA COME FROM? PRELIMINARY MONITORING OF THE PRESENCE OF SALMONELLA AT VARIOUS STAGES OF POULTRY PROCESSING
Advisor: Evangelyn Alocilja
Research Category: HEALTH AND BIOMEDICAL
Keywords: SALMONELLA, NANOBIOSENSOR, POULTRY PROCESSING
This work is supported by the US Department of Agriculture (RC113747).

Poster Number: S1-A13
Authors: Ehsan Naghavi; Seungik Baek; Lik-Chuan Lee; Haifeng Wang
Title: INVERSE MODELING OF THE CLOSED LOOP CARDIOVASCULAR BLOOD CIRCULATION USING PHYSICS INFORMED NEURAL NETWORK (PINN)
Advisor: Seungik Baek
Research Category: HEALTH AND BIOMEDICAL
Keywords: CARDIAC CYCLE, COMPUTATIONAL MODELING, PHYSICS INFORMED NEURAL NETWORK

Poster Number: S1-A14
Authors: Garrett Weidig; Brittany Bush; Fermin Jimenez; Galid Pelled; Tamara Reid Bush
Title: KINEMATIC ANALYSIS OF A LIVE, SWIMMING OCTOPUS FOR APPLICATION TO HUMAN BIOMECHANICS AND SOFT ROBOTICS
Advisor: Tamara Reid Bush
Research Category: HEALTH AND BIOMEDICAL
Keywords: OCTOPUS BIOMECHANICS, KINEMATICS, SOFT ROBOTICS
This work is supported by the National Institutes of Health.
Poster Number: S1-A16
Authors: Julie Celini; Ruijun Qin; Shahram Torabian; Yan Liu
Title: Effect of Fumigation, Cover Crops and Potato Planting on Shifts in Soil Microbial Communities
Advisor: Yan Liu
Research Category: Sustainability: Infrastructure, Environment, Energy and Water
Keywords: Soil health, Fumigation, Soil Microbial Communities

Poster Number: S1-A17
Authors: Amer Abu Arisheh; Jeffrey Nanzer
Title: A Dynamic Current Antenna for Secure Wireless Communications
Advisor: Jeffrey Nanzer
Research Category: Applied Electromagnetics
Keywords: Dynamic Current Antenna, Secure Wireless Communications, Phase Center Oscillation
This work is supported by the National Science Foundation under grant number 2028736.

Poster Number: S1-A18
Authors: Ritam Guha; Anirudh Suresh; Jared DeFrain; Kalyanmoy Deb
Title: Machine Learning Based Prediction and Analysis for Virtual Metrology Tasks in Long Batch Processes
Advisor: Kalyanmoy Deb
Research Category: Materials, Mechanics and Advanced Manufacturing
Keywords: Virtual Metrology, Batch Process, Uncertainty Estimation

Poster Number: S1-A19
Authors: Md Towhidur Rahman; Joseph Pelkey; Alexandra Zevalkink
Title: Elastic and Thermoelectric Properties of MCxR2 (M=Cu, Ag and X= S, Se)
Advisor: Alexandra Zevalkink
Research Category: Materials, Mechanics and Advanced Manufacturing
Keywords: Superionic Conductor, Thermal Diffusivity, Elastic Moduli
This work is supported by the National Science Foundation (Award number: 2118463).

Poster Number: S1-A20
Authors: Luyao Yuan; Angela Farina; Chenyang Deng; Annick Anctil
Title: Comparing the Carbon Footprint of Future Silicon Photovoltaics Manufacturing in North America and China
Advisor: Annick Anctil
Research Category: Sustainability: Infrastructure, Environment, Energy and Water
Keywords: Silicon Photovoltaics, Life Cycle Assessment, Environmental Impacts
This work is supported by the National Science Foundation.
**Poster Number:** S1-A21  
**Authors:** Ritam Ganguly; Borzoo Bonakdarpour  
**Title:** STREAM-BASED DECENTRALIZED RUNTIME VERIFICATION  
**Advisor:** Borzoo Bonakdarpour  
**Research Category:** COMPUTATIONAL AND INFORMATIONAL SYSTEMS  
**Keywords:** RUNTIME VERIFICATION, DISTRIBUTED SYSTEMS, STREAM-BASED SPECIFICATION  
This work is supported by the NSF Award CCF 2118356 and CCF 2102106.

**Poster Number:** S1-A22  
**Authors:** Behdad Ghafarnezhad; Yousef Shafahi; Mehrnaz Ghamami  
**Title:** THE IMPACTS OF FULLY AUTONOMOUS VEHICLES ON URBAN NETWORKS AND PARKING DEMANDS  
**Advisor:** Mehrnaz Ghamami  
**Research Category:** MOBILITY AND ROBOTICS  
**Keywords:** AUTONOMOUS VEHICLES, PARKING DEMANDS, URBAN NETWORKS

**Poster Number:** S1-A23  
**Authors:** Rei Doko; Kevin Liu  
**Title:** A PERFORMANCE STUDY OF STATISTICAL METHODS FOR PHYLOGENETIC RECONSTRUCTION UNDER COMPLEX NONHOMOGENEOUS SUBSTITUTION MODELS  
**Advisor:** Kevin Liu  
**Research Category:** COMPUTATIONAL AND INFORMATIONAL SYSTEMS  
**Keywords:** PHYLOGENETICS, PHYLOGENOMICS  
This work is supported by the National Science Foundation Research Traineeship Program.

**Poster Number:** S1-A24  
**Authors:** Yabing Li; Brijen Miyani; Irene Xagoraraki  
**Title:** METHODS TO TEST FOR HUMAN VIRUS DIVERSITY IN WASTEWATER: TOWARDS A PRACTICAL APPROACH FOR IDENTIFYING HUMAN VIRUSES WITH METAGENOMICS  
**Advisor:** Irene Xagoraraki  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** HUMAN VIRUSES, METAGENOMICS, WASTEWATER SURVEILLANCE  
This work is supported by the Great Lakes water authority, CDM Smith.
Poster Number: S1-A25
Authors: Carley Allison; Steven Safferman
Title: GREENHOUSE ECOSYSTEM TO TREAT CRAFT BEVERAGE WASTEWATER
Advisor: Steven Safferman
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: BIOLOGICAL WASTEWATER TREATMENT, HIGH STRENGTH WASTEWATER

Poster Number: S1-A26
Authors: Carly Gomez; Bradley Marks; Jade Mitchell; Robert Scharff; Felicia Wu
Title: DECISION SUPPORT FOR ECONOMIC VALUATION OF FOOD SAFETY RISK REDUCTION
Advisor: Brad Marks
Research Category: HEALTH AND BIOMEDICAL
Keywords: FOOD SAFETY, DECISION ANALYSIS
This work is supported by the National Science Foundation Graduate Research Fellowship Program under Grant No. DGE-1848739 and USDA National Institute of Food and Agriculture - Agriculture and Food Research Initiative, Sustainable Agricultural Systems Program grant no. 2020-68012-3182

Poster Number: S1-A27
Authors: Hamid Mozafari; Amirali Soltanpour; Farish Jazlan; Mehrnaz Ghamami; Ali Zockaie
Title: FLEET OPERATION AND ASSET MANAGEMENT STRATEGIES TO MINIMIZE THE ECONOMIC AND SOCIETAL COSTS
Advisor: Mehrnaz Ghamami
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: FLEET MANAGEMENT, ELECTRIFICATION, SOCIETAL EMISSIONS COST

Poster Number: S1-A28
Authors: Hamad Muslim; Syed Haider; Lev Khazanovich
Title: QUALITY ASSURANCE OF HOT-MIX ASPHALT CENTERLINE LONGITUDINAL JOINT USING NON-DESTRUCTIVE TESTING
Advisor: Syed Haider
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: ASPHALT PAVEMENT COMPACTION, DIELECTRIC PROFILING SYSTEM, NON-DESTRUCTIVE TESTING
This work is supported by the Minnesota Department of Transportation.
**Poster Number:** S1-A29  
**Authors:** Reza Khanmohammadi; Sari Saba-Sadiya; Sina Esfandiarpour; Tuka Alhanai; Mohammad M. Ghassemi  
**Title:** MAMBA.net: A Hybrid Neural Network for Predicting the NBA Playoffs  
**Advisor:** Mohammad Ghassemi  
**Research Category:** Computational and Informational Systems  
**Keywords:** Game Outcome Prediction, Playoff, Hybrid Neural Network

**Poster Number:** S1-A30  
**Authors:** Mehdi Bulduk; Bora Cetin  
**Title:** Compaction Control of Unbound Granular Materials Using In-place Density and Light Weight Deflectometer Tests  
**Advisor:** Bora Cetin  
**Research Category:** Materials, Mechanics and Advanced Manufacturing  
**Keywords:** Compaction, Granular Materials, Light Weight Deflectometer Test

**Poster Number:** S1-A31  
**Authors:** Roshanak Mirzaee; Parisa Kordjamshidi  
**Title:** Transfer Learning with Synthetic Corpora for Spatial Role Labeling and Reasoning  
**Advisor:** Parisa Kordjamshidi  
**Research Category:** Computational and Informational Systems  
**Keywords:** Spatial Reasoning, Transfer Learning, Spatial Role Labeling

**Poster Number:** S1-A32  
**Authors:** Sarah P. Roberts; Alex J. Loomis; Aaron Hardy; Jonas N. Becker; Shannon S. Nicley  
**Title:** Effects of Surface Preparation on Defect Incorporation of Single Crystal Diamond Grown via Chemical Vapor Deposition  
**Advisor:** Shannon Nicley  
**Research Category:** Materials, Mechanics and Advanced Manufacturing  
**Keywords:** Diamond, Chemical Vapor Deposition, Sample Preparation  
This work is supported by the MSU Strategic Planning Grant.

**Poster Number:** S1-A33  
**Authors:** Ali Rostami; Ehsan Kamjoo; Ali Zockaie  
**Title:** Estimating Path Travel Costs in Large-Scale Networks Using Machine Learning Techniques  
**Advisor:** Ali Zockaie  
**Research Category:** Mobility and Robotics  
**Keywords:** Travel Time Estimation, Vehicle Trajectory Data, Machine Learning
**Poster Number:** S1-A34  
**Authors:** Meheryar Kasad; James Jackson; Scott Calabrese Barton; Christopher Saffron  
**Title:** BIO-OIL UPGRADING TO FUELS AND CHEMICALS BY COMBINING CHEMICAL PRE-REDUCTION WITH ELECTROCATALYTIC HYDROGENATION  
**Advisor:** Christopher Saffron  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** ELECTROCATALYSIS, BIO-OIL, RENEWABLE FUELS

**Poster Number:** S1-A35  
**Authors:** Arunav Nanda; Narendra Das; Ehsan Jalilvand; Konstantinos Andreadis; Susantha Jayasinghe; Ix Hour  
**Title:** OPTIMIZATION OF SOIL PARAMETERS IN THE HYDROLOGICAL MODEL AND ITS IMPACT ASSESSMENT IN AGRICULTURAL DROUGHT ESTIMATION  
**Advisor:** Narendra Das  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** OPTIMIZATION, HYDROLOGICAL MODEL, SMAP  
This work is supported by the NASA SERVIR, SMAP mission.

**Poster Number:** S1-A36  
**Authors:** Mehrsa Mardikoraem; Daniel Woldring  
**Title:** LEVERAGING EMBEDDING AND MACHINE LEARNING TECHNIQUES FOR A DEEPER INSIGHT INTO THE PROTEIN FITNESS LANDSCAPE  
**Advisor:** Daniel Woldring  
**Research Category:** HEALTH AND BIOMEDICAL  
**Keywords:** PROTEIN FITNESS PREDICTION - MACHINE LEARNING - THERAPEUTICS & DIAGNOSTICS

**Poster Number:** S1-A37  
**Authors:** Asadullah Hill Galib; Lifeng Luo; Pang-Ning Tan  
**Title:** SIMEXIT: ENHANCING TIME SERIES FORECASTING OF EXTREME VALUES VIA SELF-SUPERVISED REPRESENTATION LEARNING  
**Advisor:** Pang-Ning Tan  
**Research Category:** COMPUTATIONAL AND INFORMATIONAL SYSTEMS  
**Keywords:** SELF-SUPERVISED LEARNING, TIME SERIES FORECASTING, EXTREME VALUE MODELING  
This work is supported by the National Science Foundation (Award Number: 2006633).
**Poster Number:** S1-A38  
**Authors:** Shivangi Yadav; Arun Ross  
**Title:** iWarpGAN: DISENTANGLING IDENTITY AND STYLE TO GENERATE NEW IRIS IMAGES  
**Advisor:** Arun Ross  
**Research Category:** COMPUTATIONAL AND INFORMATIONAL SYSTEMS  
**Keywords:** GENERATIVE ADVERSARIAL NETWORK (GAN), IMAGE TRANSFORMATION, DEEP LEARNING  
This work is supported by the NSF Center for Identification Technology Research.

**Poster Number:** S1-A39  
**Authors:** Saeed Memari; Phanikumar S. Mantha  
**Title:** COMBINING MECHANISTIC MODELS WITH MACHINE LEARNING FOR ACCURATE LAKE CIRCULATION AND TRANSPORT MODELING  
**Advisor:** Phanikumar Mantha  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** NUMERICAL MODELING, MACHINE LEARNING, MULTI-METHOD APPROACH

**Poster Number:** S1-A40  
**Authors:** Christina Wark; Yan Xie; Scott Calabrese Barton  
**Title:** NUMERICAL MODEL OF STEADY STATE BEHAVIOR IN THE TRICARBOXYLIC ACID CYCLE  
**Advisor:** Scott Calabrese Barton  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** ELECTROSTATIC CHANNELING, CASCADE KINETICS, TCA CYCLE

**Poster Number:** S1-A41  
**Authors:** Zachary Gentry; Liang Zhao; Irene Xagoraraki  
**Title:** WASTEWATER SURVEILLANCE BEYOND COVID-19: A RANKING SYSTEM FOR COMMUNICABLE DISEASE TESTING IN TRI-COUNTY DETROIT AREA, MICHIGAN, USA  
**Advisor:** Irene Xagoraraki  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** WASTEWATER SURVEILLANCE, COMMUNICABLE DISEASES, RANKING SYSTEM  
This work is supported by the Michigan Department of Health and Human Services and the Great Lakes Water Authority.
Poster Number: S1-A42
Authors: Tzu-Han Hsu; Borzoo Bonakdarpour
Title: BOUNDED MODEL CHECKING FOR HYPERPROPERTIES
Advisor: Borzoo Bonakdarpour
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: MODEL CHECKING, INFORMATION-FLOW SECURITY, HYPERPROPERTIES

Poster Number: S1-A43
Authors: Arya Tanmay Gupta; Sandeep Kulkarni
Title: INDUCING LATTICES TO ALLOW ASYNCHRONY
Advisor: Sandeep Kulkarni
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: ASYNCHRONY, LATTICE LINEARITY, SELF-STABILIZATION

Poster Number: S1-A44
Authors: Xinda Qi; Tong Gao; Xiaobo Tan
Title: BIOINSPIRED 3D-PRINTED SNAKESKINS ENABLE EFFECTIVE SERPENTINE LOCOMOTION OF A SOFT ROBOTIC SNAKE
Advisor: Xiaobo Tan
Research Category: MOBILITY AND ROBOTICS
Keywords: SNAKE ROBOT, LOCOMOTION, SOFT ROBOTICS

Poster Number: S1-A45
Authors: Brianna Tavolacci; Annick Anctil
Title: INVESTIGATING SOLAR PHOTOVOLTAIC WASTE UNDER SIMULATED LANDFILL CONDITIONS TOWARDS END-OF-LIFE MANAGEMENT AND RECYCLING
Advisor: Annick Anctil
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: PHOTOVOLTAICS, RECYCLING, TOXICITY
This work is supported by the National Science Foundation.

Poster Number: S1-A46
Authors: Niloufar Eghbali; Tuka Alhanai; Mohammad M. Ghassemi
Title: REINFORCEMENT LEARNING APPROACH TO SEDATION AND DELIRIUM MANAGEMENT IN THE INTENSIVE CARE UNIT
Advisor: Mohammad Ghassemi
Research Category: HEALTH AND BIOMEDICAL
Keywords: REINFORCEMENT LEARNING, PRECISION MEDICINE DOSING, SEQUENTIAL DECISION MAKING
**Poster Number:** S1-A47  
**Authors:** Nischal Gupta; Anshu Bamney; Alireza Rostami; Ehsan Kamjoo; Peter Savolainen  
**Title:** HOW DID THE COVID-19 PANDEMIC AFFECT TRAFFIC SPEED AND SAFETY TRENDS ON LIMITED ACCESS FREeways?  
**Advisor:** Peter Savolainen  
**Research Category:** MOBILITY AND ROBOTICS  
**Keywords:** COVID-19, TRAFFIC SAFETY, SPEED LIMIT

**Poster Number:** S1-A48  
**Authors:** Farish Jazlan; Amirali Sultanpour; Ali Zockaie; Mehrnaz Ghamami  
**Title:** MICHIGAN ISLAND MOBILITY: IDEAL FEDERAL AND STATE TRANSPORTATION RESPONSIBILITIES AND POLICIES  
**Advisor:** Ali Zockaie  
**Research Category:** MOBILITY AND ROBOTICS  
**Keywords:** FERRY SERVICES, ISLAND MOBILITY, PUBLIC POLICY  
This work is supported by the Michigan Department of Transportation (OR21-012).

**Poster Number:** S1-A49  
**Authors:** Mohammed Almatrood; Devdip Sen; Bige Unluturk; Ulkuhan Guler  
**Title:** TOWARDS HARDWARE AND SOFTWARE INTEGRATION OF NONINVASIVE TRANSCUTANEOUS OXYGEN MONITOR  
**Advisor:** Bige Unluturk  
**Research Category:** COMPUTATIONAL AND INFORMATIONAL SYSTEMS  
**Keywords:** KROGH, TRANSCUTANEOUS, WEARABLE

**Poster Number:** S1-A50  
**Authors:** Parisa Farmanifard; Arun Ross  
**Title:** CROSS-SPECTRAL FACE RECOGNITION USING A SEMANTIC-GUIDED GENERATIVE ADVERSARIAL NETWORK (SG-GAN)  
**Advisor:** Arun Ross  
**Research Category:** COMPUTATIONAL AND INFORMATIONAL SYSTEMS  
**Keywords:** CROSS-SPECTRAL RECOGNITION, MULTIMODAL BIOMETRICS, IMAGE PROCESSING  
This work is supported by the Polaris, Inc.
POSTER SESSION 1
POSTER GROUP B
9:30AM – 11:00AM
2200 HALLWAY AND 2500 HALLWAY
**Poster Number:** S1-B1  
**Authors:** Liang Zhao; Yangyang Zou; Irene Xagoraraki  
**Title:** PREDICTING COVID-19 OUTBREAKS THROUGH WASTEWATER SURVEILLANCE: ADVANCED MATHEMATICAL MODELS AND SIMPLE STATISTICAL METHODS  
**Advisor:** Irene Xagoraraki  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** WASTEWATER SURVEILLANCE, PREDICTIONS, EARLY WARNINGS  
This work is supported by the Michigan Department of Health and Human Services (MDHHS) and the Great Lakes Water Authority (GLWA).

**Poster Number:** S1-B2  
**Authors:** Katherine McCullen; Yan Liu; Perry K.W. Ng  
**Title:** PROBIOTIC FERMENTATION OF SOYBEAN AND SOYBEAN-MEAL FOR USE IN ANIMAL FEED  
**Advisor:** Yan Liu  
**Research Category:** SMART AG  
**Keywords:** FERMENTATION, PROBIOTIC, SOYBEAN

**Poster Number:** S1-B3  
**Authors:** Pegah Varghaei; Arun Ross  
**Title:** INTELLIGENT FRAME SELECTION FROM VIDEOS TO IMPROVE FACE RECOGNITION ACCURACY  
**Advisor:** Arun Ross  
**Research Category:** COMPUTATIONAL AND INFORMATIONAL SYSTEMS  
**Keywords:** VIDEO FRAMES SELECTION, FACE IMAGE QUALITY ASSESSMENT, FACE RECOGNITION.  
This work is supported by the Intelligence Advanced Research Projects Activity (IARPA).

**Poster Number:** S1-B4  
**Authors:** Ehsan Kamjoo; Alireza Rostami; Anshu Bamney; Nischal Gupta; Peter Savolainen; Ali Zockaie  
**Title:** INVESTIGATING CHANGES IN TRAVEL BEHAVIOR OVER TIME IN RESPONSE TO THE COVID-19 PANDEMIC  
**Advisor:** Ali Zockaie  
**Research Category:** MOBILITY AND ROBOTICS  
**Keywords:** TRAVEL BEHAVIOR, COVID-19, TELE-COMMUTING

**Poster Number:** S1-B5  
**Authors:** Matias Leon; Xiaoqiang Ni; Luke Naugthon  
**Title:** EXAMINING REACTIVITY AND CHEMICAL COMPOSITION OF LUNAR AND MARTIAN REGOLITH SIMULANTS  
**Advisor:** Bill Jin  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** NASA, CONCRETE, 3D PRINTABILITY  
This work is supported by the 80NSSC20M0124.
Poster Number: S1-B6
Authors: Sharmila Samaroo; Charley Hengesbach; Lincoln Mtemeri; Chase Bruggeman; Thomas Guarr; David P. Hickey
Title: QUANTIFYING THE INFLUENCE OF CH-PI INTERACTIONS ON NON-AQUEOUS ELECTROLYTE SOLUBILITY
Advisor: David Hickey
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: ENERGY STORAGE, REDOX FLOW BATTERIES, SOLUBILITY

Poster Number: S1-B7
Authors: Joydeep Rakshit; Christina Chan
Title: INVESTIGATING THE ROLE OF HISTONE DEACETYLASES IN PALMITATE TREATED ASTROCYTES
Advisor: Christina Chan
Research Category: HEALTH AND BIOMEDICAL
Keywords: EPIGENETICS, NEUROINFLAMMATION, DRUG TARGET

Poster Number: S1-B8
Authors: Kent Daniel; Mazza Dominic; Radha Hayder
Title: ROBUST ADAPTIVE MODULAR PERCEPTION SYSTEM (RAMPS): A NODE-BASED PROCESSING FRAMEWORK FOR TRAINING AND TESTING PERCEPTION SYSTEMS
Advisor: Hayder Radha
Research Category: MOBILITY AND ROBOTICS
Keywords: RESEARCH SOFTWARE, COMPUTER VISION, DEEP LEARNING
This work is supported by the Amazon Research Award, Semiconductor Research Corporation (SRC) and MSU Foundation.

Poster Number: S1-B9
Authors: Christopher K. Herrera; Eric J. Stallknecht; Thomas D. Sharkey; Erik S. Runkle; Richard R. Lunt
Title: DESIGNING PLANT-TRANSPARENT AGRIVOLTAICS
Advisor: Richard Lunt
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: AGRIVOLTAICS, TRANSPARENT PHOTOVOLTAICS
This work is supported by the Horticultural Research Institute.

Poster Number: S1-B10
Authors: Julia Zheng; Kevin Liu
Title: SPECIES TREE ACCURACY IMPACTS COPHYLOGENETIC RECONCILIATION
Advisor: Kevin Liu
Research Category: HEALTH AND BIOMEDICAL
Keywords: COPHYLOGENETICS, PHYLOGENETICS, COEVOLUTION
Poster Number: S1-B11
Authors: Hossein Rajaby-Faghihi; Parisa Kordjamshidi; Choh-Man Teng; James Allen
Title: THE ROLE OF SEMANTIC PARSING IN UNDERSTANDING PROCEDURAL TEXT
Advisor: Parisa Kordjamshidi
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: NATURAL LANGUAGE PROCESSING, REASONING, SEMANTIC PARSING

Poster Number: S1-B12
Authors: Yimeng Zhang; Xin Chen; Jinghan Jia; Sijia Liu; Ke Ding
Title: TEXT-VISUAL PROMPTING FOR EFFICIENT 2D TEMPORAL VIDEO GROUNDING
Advisor: Sijia Liu
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: TEMPORAL VIDEO GROUNDING, COMPUTER VISION, PROMPTING

Poster Number: S1-B13
Authors: Saad Asadullah Sharief; Evangelyn Alocilja
Title: RAPID B. CEREUS CLASSIFICATION USING MAGNETIC NANOPARTICLES AND MACHINE LEARNING APPLIED TO NEAR INFRARED SPECTROSCOPY DATA
Advisor: Evangelyn Alocilja
Research Category: HEALTH AND BIOMEDICAL
Keywords: PATHOGEN, BIOSENSOR, MACHINE LEARNING

Poster Number: S1-B14
Authors: Yunlu Zhang; Scott Calabrese Barton
Title: PRUSSIAN BLUE ANALOGUES AS CATHODE MATERIALS FOR AQUEOUS CA-ION BATTERY
Advisor: Scott Calabrese Barton
Research Category: MATERIALS, MECHANICS AND ADVANCED MANUFACTURING
Keywords: BATTERY, CATHODE MATERIALS, KINETICS

Poster Number: S1-B15
Authors: Molly Robles; Katie Dailey; Leah Jarmolowicz; Dawn Dechand
Title: REVIEW OF DUCKWEED: ITS MICROBIOME, EXUDATES AND THEIR EFFECT ON EACH OTHER
Advisor: Dawn Dechand
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: DUCKWEED, EXUDATES, METABOLITES
This work is supported by the U.S. Department of Agriculture, National Institute of Food and Agriculture.
**Poster Number:** S1-B16  
**Authors:** Sunia Tanweer; Joshua Templeman; Firas Khasawneh; Elizabeth Munch  
**Title:** EXPLORING TOPOLOGICAL DATA ANALYSIS FOR IDENTIFYING PHENOMENOLOGICAL STOCHASTIC BIFURCATIONS  
**Advisor:** Firas Khasawneh  
**Research Category:** COMPUTATIONAL AND INFORMATIONAL SYSTEMS  
**Keywords:** STOCHASTIC DYNAMICAL SYSTEMS, TOPOLOGICAL DATA ANALYSIS, BIFURCATIONS  
This work is supported by the Air Force Office of Scientific Research (AFOSR).

**Poster Number:** S1-B17  
**Authors:** Aaron Feinauer; Sai Jakkala; Andre Benard; Joerg Petrasch  
**Title:** NUSSELT NUMBER AND FRICTION FACTOR CORRELATIONS FOR HEAT EXCHANGER PLATES WITH S-SHAPED FINS  
**Advisor:** Andre Benard  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** CONVECTIVE HEAT TRANSFER, NUSSELT NUMBER, FRICTION FACTOR  
This work is supported by the Advanced Research Projects Agency - Energy.

**Poster Number:** S1-B18  
**Authors:** Oznur Caliskan-Aydogan; Saad Asadullah Sharief; Evangelyn Alocilja  
**Title:** CARBOHYDRATE-COATED NANOPARTICLES FOR PCR-LESS DETECTION OF SALMONELLA FROM CHICKEN MEAT  
**Advisor:** Evangelyn Alocilja  
**Research Category:** HEALTH AND BIOMEDICAL  
**Keywords:** FOOD SAFETY; PATHOGENS; SALMONELLA

**Poster Number:** S1-B19  
**Authors:** Augusto Gil; Venkatesh Kodur  
**Title:** SHEAR STRENGTH OF ULTRA-HIGH PERFORMANCE CONCRETE AT ELEVATED TEMPERATURES AND ITS INFLUENCE ON THE FIRE RESPONSE OF CONCRETE BRIDGES  
**Advisor:** Venkatesh Kodur  
**Research Category:** MATERIALS, MECHANICS AND ADVANCED MANUFACTURING  
**Keywords:** FIRE SAFETY, SHEAR STRENGTH, ULTRA-HIGH PERFORMANCE CONCRETE  
This work is supported by the Precast/Prestressed Concrete Institute (PCI) - Dennis R Mertz Bridge Fellowship.
**Poster Number:** S1-B20  
**Authors:** Ian Klug; Bradley Marks; Sanghyup Jeong  
**Title:** QUANTIFYING CLEANLINESS OF FOOD CONTACT SURFACES USING CONDUCTIVITY OF TOTAL DISSOLVED SOLIDS  
**Advisor:** Sanghyup Jeong  
**Research Category:** SMART AG  
**Keywords:** CLEANING, FOOD SAFETY, POWDERS

**Poster Number:** S1-B21  
**Authors:** Christiana Kiesling; Patricia Guillaume; Kristen Cetin; Cristina Poleacovschi; Jessica Ullrich; Bill Gallus; Bora Cetin  
**Title:** RESPONDING TO ENERGY INSECURITY IN ARCTIC HOUSING USING COMMUNITY-BASED PARTICIPATORY RESEARCH  
**Advisor:** Kristen Cetin  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** ENERGY, SUSTAINABILITY, HOUSING  
This work is supported by the National Science Foundation.

**Poster Number:** S1-B22  
**Authors:** Denghao Fu; Caroline R. Szczepanski  
**Title:** IMPROVEMENT OF METHACRYLATE-BASED POLYMER NETWORKS VIA INCORPORATION OF SELF-COMPLEMENTARY MULTIPLE HYDROGEN-BONDING MOIETIES  
**Advisor:** Caroline Szczepanski  
**Research Category:** MATERIALS, MECHANICS AND ADVANCED MANUFACTURING  
**Keywords:** POLYMER NETWORK, HYDROGEN BONDING, ADHESION  
This work is supported by the National Institute of Dental and Craniofacial Research, award K25DE028949.

**Poster Number:** S1-B23  
**Authors:** Yiyang Su; Minchul Kim; Feng Liu; Xiaoming Liu  
**Title:** GLOBALGAIT: GLOBAL SPATIOTEMPORAL REPRESENTATION LEARNING FOR GAIT RECOGNITION VIA SEQUENCE COMPLETION  
**Advisor:** Xiaoming Liu  
**Research Category:** COMPUTATIONAL AND INFORMATIONAL SYSTEMS  
**Keywords:** COMPUTER VISION, GAIT RECOGNITION  
This work is supported by the Intelligence Advanced Research Projects Activity.
Poster Number: S1-B24
Authors: Angelica Louise M. Gacis; Anthony James DM. Franco; Evangelyn C. Alocilja
Title: DEVELOPMENT OF A MACHINE-LEARNING ALGORITHM AS A TOOL FOR THE DEVELOPMENT OF A RAPID, MAGNETIC NANO PARTICLE-AIDED ESTIMATION OF BACTERIAL CONCENTRATION
Advisor: Evangelyn Alocilja
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: MACHINE LEARNING, IMAGE CLASSIFICATION, DETECTION

Poster Number: S1-B25
Authors: Autumn K McLane-Svoboda; Brittany Bush; Julianna Richie; Cynthia Chestek; Galit Pelled
Title: SENSORIMOTOR NEURAL RESPONSES TO EXTERNAL STIMULATION IN OCTOPUS BIMACULOIDES ARMS
Advisor: Galit Pelled
Research Category: HEALTH AND BIOMEDICAL
Keywords: OCTOPUS, NEURONS, ELECTRODES
This work is supported by the NIH/NINDS (UF1NS115817).

Poster Number: S1-B26
Authors: Yuanda Wang; Hanqing Guo; Qiben Yan
Title: GHOSTTALK: INTERACTIVE ATTACK ON SMARTPHONE VOICE SYSTEM THROUGH POWER LINE
Advisor: Qiben Yan
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: INAUDIBLE VOICE COMMANDS; VOICE ASSISTANT; MOBILE SECURITY

Poster Number: S1-B27
Authors: Jacob Reynolds; Brian Johnson
Title: HARNESSING CNC MICROMILLING TO ENGINEER EPITHELIAL — MESENCHYME MICROTISSUES TO STUDY CELL —CELL SIGNALING
Advisor: Brian Johnson
Research Category: HEALTH AND BIOMEDICAL
Keywords: MICROPHYSIOLOGICAL MODEL, PARACRINE SIGNALING, OROFACIAL DEVELOPMENT
This work is supported by the NIH R00 ES028744.

Poster Number: S1-B28
Authors: Junyuan Hong; Lingjuan Lyu; Jiayu Zhou; Michael Spranger
Title: MECTA: MEMORY-ECONOMIC CONTINUAL TEST-TIME MODEL ADAPTATION
Advisor: Jiayu Zhou
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: MACHINE LEARNING, MODEL ADAPTATION, INTERNET-OF-THINGS
Poster Number: S1-B29
Authors: Poornachandra Vaddya; Muhammed Emin Kutay; Seyed Farhad Abdollahi; Mumtahin Hasnat
Title: DEVELOPMENT OF A NON-CONTACT MEASUREMENT TECHNIQUE FOR ASPHALT MIXTURE UNIAXIAL FATIGUE TESTING
Advisor: Muhammed Emin Kutay
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: IMAGE ANALYSIS, HOT MIX ASPHALT, OPTICAL FLOW METHOD, ACCELERATED TESTING
This work is supported by the Federal Highway Administration.

Poster Number: S1-B30
Authors: Ethan Lau; Vaibhav Srivastava; Shaunak Bopardikar
Title: A MULTI-FIDELITY BAYESIAN APPROACH TO SAFE CONTROLLER DESIGN
Advisor: Shaunak Bopardikar
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: CONTROLS, GAUSSIAN PROCESS, MULTI-FIDELITY
This work is supported by the ARO grant W911NF-18-1-0325.

Poster Number: S1-B31
Authors: Michael Kaven; Ilce Medina Meza
Title: REFINING SIMULTANEOUS MEASUREMENT OF SERUM VITAMIN D AND SECOSTEROIDS
Advisor: Ilce Medina Meza
Research Category: HEALTH AND BIOMEDICAL
Keywords: VITAMIN D, METABOLOMICS, ALZHEIMER'S DISEASE

Poster Number: S1-B32
Authors: Brijen Miyani; Yangyang Zou; Irene Xagoraraki
Title: WASTEWATER SURVEILLANCE FOR IDENTIFICATION OF ENDEMIC AND EMERGING VIRAL DISEASES IN TRUJILLO-PERU
Advisor: Irene Xagoraraki
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: WASTEWATER SURVEILLANCE, ENDEMIC AND EMERGING VIRUSES, PCR

Poster Number: S1-B33
Authors: Tanzilur Rahman; Connor Wasick; Megumi Kawasaki; Carl J. Boehlert
Title: MICROSTRUCTURAL CHARACTERIZATION OF Zn-3Mg(WT.%) PROCESSED BY HIGH-PRESSURE TORSION
Advisor: Carl Boehlert
Research Category: MATERIALS, MECHANICS AND ADVANCED MANUFACTURING
Keywords: HIGH-PRESSURE TORSION, SEVERE PLASTIC DEFORMATION, MICROSTRUCTURAL CHARACTERIZATION
Poster Number: S1-B34
Authors: Fuming Yang; Mingzhe Li; Robert McCoy; Dean Jaradi
Title: SOLID-LIQUID INTERACTION BETWEEN THIN-WALLED TUBE AND WET GLASS MICROBUBBLES UNDER AXIAL CRUSHING
Advisor: Fuming Yang
Research Category: MATERIALS, MECHANICS AND ADVANCED MANUFACTURING
Keywords: thin-walled tube, glass microbubble, energy absorption, filler-tube wall interaction

Poster Number: S1-B35
Authors: Gregory Rouland; Steven Safferman
Title: CHARACTERIZATION OF MICHIGAN MEAT PROCESSING WASTEWATER
Advisor: Steven Safferman
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: wastewater, characterization, meat
This work is supported by the Michigan Alliance for Animal Agriculture (M-AAA).

Poster Number: S1-B36
Authors: Sloan Kanat; Ryan Harth; Krissy Guzak; Tamara Reid Bush
Title: EVALUATING ACCESSIBILITY OF AUTONOMOUS VEHICLE PICK UP AND DROP OFF ZONES FOR PERSONS WITH DISABILITIES
Advisor: Tamara Reid Bush
Research Category: MOBILITY AND ROBOTICS
Keywords: disability, accessibility, autonomous vehicle
This work is supported by the Ford - Michigan State Alliance.

Poster Number: S1-B37
Authors: Abhijeet Abhishek; Narendra N. Das; Phanikumar S. Mantha
Title: EXPLORING THE EFFICACY OF SEASONAL CLIMATE FORECASTS ON CROP YIELDS FOR AGRICULTURE SUSTAINABILITY
Advisor: Phanikumar S. Mantha
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: climate forecast, hydrologic modeling, crop modeling
This work is supported by the National Aeronautics and Space Administration (NASA).

Poster Number: S1-B38
Authors: Andrew Hou; Michel Sarkis; Ning Bi; Yijing Tong; Xiaoming Liu
Title: FACE RELIGHTING WITH GEOMETRICALLY CONSISTENT SHADOWS
Advisor: Xiaoming Liu
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: face relighting, shadow modeling, computer vision
This work is supported by the Qualcomm Technologies Inc.
Poster Number: S1-B39
Authors: Nunzio Giorgio Carducci; David Hickey
Title: BIOELECTROCHEMICAL LIGNIN VALORIZATION USING LOW-COST NAD+ BIOMIMETICS
Advisor: David Hickey
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: FUEL CELL, ELECTROCHEMISTRY, BIOENGINEERING
This work is supported by the ACS Petroleum Research Fund.

Poster Number: S1-B40
Authors: Anik Momtaz; Houssam Abbas; Borzoo Bonakdarpour
Title: MONITORING SIGNAL TEMPORAL LOGIC IN DISTRIBUTED CYBER-PHYSICAL
Advisor: Borzoo Bonakdarpour
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: RUNTIME VERIFICATION, DISTRIBUTED SYSTEM, SIGNALS, TEMPORAL LOGIC

Poster Number: S1-B41
Authors: Tanjila Akhter; Yadu Pokhrel; Farshid Felfelani
Title: SCALE DEPENDENCY OF LATERAL GROUNDWATER FLOW IN GLOBAL EARTH SYSTEM MODELS
Advisor: Yadu Pokhrel
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: LATERAL GROUNDWATER FLOW, SPATIAL SCALE, GLOBAL EARTH SYSTEM MODELS
This work is supported by the National Science Foundation and Belmont Forum; Award# 2127643.

Poster Number: S1-B42
Authors: Francis Hanna; Annick Anctil
Title: LIFE CYCLE ASSESSMENT OF TELLURIUM PRODUCTION VIA HYDROMETALLURGICAL PROCESSING OF COPPER ANODE SLIMES
Advisor: Annick Anctil
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: TELLURIUM, LIFE CYCLE ASSESSMENT, HYDROMETALLURGY

Poster Number: S1-B43
Authors: Phyllis Feldpausch; Huy Dang; Yadu Pokhrel
Title: QUANTIFYING THE IMPACTS OF CLIMATE CHANGE ON THE GREAT LAKES REGION
Advisor: Yadu Pokhrel
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: CLIMATE CHANGE, HYDROLOGY, GREAT LAKES
This work is supported by the National Science Foundation Award Number: 1752729.
**Poster Number:** S1-B44  
**Authors:** Zebadiah Miles; Sunil Chakrapani  
**Title:** CREATION DIGITAL TWINS USING NONDESTRUCTIVE ULTRASONIC TESTING  
**Advisor:** Sunil Chakrapani  
**Research Category:** MATERIALS, MECHANICS AND ADVANCED MANUFACTURING  
**Keywords:** NON-DESTRUCTIVE TESTING, DIGITAL TWIN, ADDITIVE MANUFACTURING

**Poster Number:** S1-B45  
**Authors:** Poornachandra Vaddy; Tanzila Islam; M Emin Kutay; Sayed W Haider; Bora Cetin  
**Title:** EVALUATING THE EFFECT OF SPRAY-ON REJUVENATORS ON ASPHALT PAVEMENT SURFACES  
**Advisor:** M Emin Kutay  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** SPRAY-ON REJUVENATORS, ASPHALT PAVEMENTS, CREEP STIFFNESS

**Poster Number:** S1-B46  
**Authors:** Piyush Gupta; Demetris Coleman; Joshua Siegel  
**Title:** TOWARDS PHYSICALLY ADVERSARIAL INTELLIGENT NETWORKS FOR SAFER SELF-DRIVING  
**Advisor:** Joshua Siegel  
**Research Category:** MOBILITY AND ROBOTICS  
**Keywords:** AUTONOMOUS DRIVING, REINFORCEMENT LEARNING, ADVERSARIAL LEARNING

**Poster Number:** S1-B47  
**Authors:** Adam J. Chrzan; Nicole D. Arnold; Kevin Chan; Tamara Reid Bush  
**Title:** DOES SELECTION LEAD TO SIGNIFICANCE?: HOW COORDINATE SYSTEM SELECTION AFFECTS THUMB CARPOMETACARPAL JOINT ANGLES  
**Advisor:** Tamara Reid Bush  
**Research Category:** HEALTH AND BIOMEDICAL  
**Keywords:** JOINT ANGLES, THUMB CARPOMETACARPAL, COORDINATE SYSTEM  
This work is supported by the Spectrum Health - Michigan State University Alliance Grant.

**Poster Number:** S1-B48  
**Authors:** Chase Bruggeman; Karissa Gregurash; David Hickey  
**Title:** NADH BIOMIMETICS: DIMERIZATION AND REGENERATION  
**Advisor:** David Hickey  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** ELECTROCHEMISTRY, ALTERNATING CURRENT VOLTAMMETRY, SODIUM PYRUVATE  
This work is supported by the American Chemical Society, Petroleum Research Fund.
Poster Number: S1-B49
Authors: Demetris Coleman; Pearce Reickert; Xiaobo Tan; Alexander George
Title: UNDERWATER APRILTAG LOCALISATION INCORPORATING REFRACTION CORRECTION
Advisor: Xiaobo Tan
Research Category: MOBILITY AND ROBOTICS
Keywords: UNDERWATER LOCALISATION, APRILTAG, REFRACTION

Poster Number: S1-B50
Authors: Sagar Keshari; Md Shakir Mahmud; Sakar Pahari; Myles Overall; Dario Babic; Timothy J. Gates; Peter Savolainen
Title: EVALUATION OF BRIDGE DECK WINTER WEATHER WARNING SYSTEMS
Advisor: Timothy J. Gates
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: BRIDGE DECK WARNING SYSTEM, DYNAMIC SPEED FEEDBACK SIGN, INCLEMENT WEATHER
This work is supported by the Michigan Department of Transportation.

Poster Number: S1-B51
Authors: Faizan Lali; Syed Waqar Haider
Title: SENSITIVITY ANALYSIS AND RE-CALIBRATION OF BOTTOM-UP FATIGUE CRACKING PERFORMANCE MODEL FOR REHABILITATED FLEXIBLE PAVEMENTS
Advisor: Syed Waqar Haider
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: SENSITIVITY ANALYSIS, MULTIVARIATE ANALYSIS, RE-CALIBRATION OF PAVEMENT ME MODEL
POSTER SESSION 2
POSTER GROUP C
11:00AM – 12:30PM
2300 HALLWAY AND 2400 HALLWAY
Poster Number: S2-C1
Authors: Ritam Guha; Kalyanmoy Deb
Title: REGEMO: SACRIFICING PARETO-OPTIMALITY FOR REGULARITY IN MULTI-OBJECTIVE PROBLEM-SOLVING
Advisor: Kalyanmoy Deb
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: MULTI-OBJECTIVE OPTIMIZATION, REGULARITY, PLATFORM-BASED DESIGNS

Poster Number: S2-C2
Authors: Kevin Dunne; Enoch Acquah; Mojgan Nejad
Title: FLEXIBLE POLYURETHANE FOAMS DERIVED FROM LIGNIN FOR AUTOMOTIVE APPLICATIONS
Advisor: Mojgan Nejad
Research Category: MATERIALS, MECHANICS AND ADVANCED MANUFACTURING
Keywords: LIGNIN, POLYURETHANE, FOAM
This work is supported by the Centre for Research and Innovation in the Bio-Economy (CRIBE) and Michigan Translational Research and Commercialization (MTRAC).

Poster Number: S2-C3
Authors: Sunday Imosemi; Nischal Gupta; Megat-Usamah Megat-Johari; Qiuqi Cai; Peter Savolainen
Title: EVALUATING THE PERFORMANCE AND SAFETY EFFECTIVENESS OF ROUNDABOUTS
Advisor: Peter Savolainen
Research Category: MOBILITY AND ROBOTICS
Keywords: SAFETY PERFORMANCE FUNCTION, ROUNDABOUTS, YEILDING BEHAVIOR
This work is supported by the Michigan Department of Transportation.

Poster Number: S2-C4
Authors: Shardula Gawankar; Susan Masten
Title: DEVELOPMENT OF A SCREENING TECHNIQUE TO IDENTIFY THE PRODUCTION OF RADICALS DURING PERSULFATE/PEROXIDE OXIDATION ACTIVATED BY FERROUS IONS USING METHYLENE BLUE DYE
Advisor: Susan Masten
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: ADVANCED OXIDATION, WATER TREATMENT, MICROCYSTIN LR

Poster Number: S2-C5
Authors: Claudia Chen; Xiaobo Tan
Title: RAPID FABRICATION OF FLEXIBLE PRESSURE SENSOR ARRAY
Advisor: Xiaobo Tan
Research Category: MOBILITY AND ROBOTICS
Keywords: FLEXIBLE SENSOR ARRAY, RAPID FABRICATION, ELECTRONIC SKIN
Poster Number: S2-C6
Authors: Meghan L. Hill; Seock-Jin Chung; Kay Hadrick; Rachna Parikh; Leila Mwangi; Hyeon-Joo Woo; Taeho Kim
Title: PHOTOTHERANOSTIC EFFECTS OF EXTRACELLULAR VESICLE-COATED NANOPARTICLES FOR GliOBlastoma TREATMENT
Advisor: Taeho Kim
Research Category: HEALTH AND BIOMEDICAL
Keywords: NANOPARTICLES, GliOBlastoma, THERANOSTIC

Poster Number: S2-C7
Authors: Geeta Kumari; Carl Boehlert; S. Sankaran; M. Sunadararaman
Title: FLIGHT TICKETS COST A FORTUNE: LET ME HELP YOU!
Advisor: Carl Boehlert
Research Category: MATERIALS, MECHANICS AND ADVANCED MANUFACTURING
Keywords: AEROSPACE, SUPERALLOY, MICROSTRUCTURE

Poster Number: S2-C8
Authors: Jinghan Jia; Sijia Liu
Title: CLAWSAT: TOWARDS BOTH ROBUST AND ACCURATE CODE MODELS
Advisor: Sijia Liu
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: ROBUSTNESS, PROGRAMMING LANGUAGES, DEEP LEARNING
This work is supported by the National Science Foundation.

Poster Number: S2-C9
Authors: Yunxiu Qiu; Bryan Smith
Title: THE MECHANICS OF TUMOR CELL CYTOSKELETAL BEHAVIOR IN METASTATIC INVASION VIA MICRORHEOLOGY
Advisor: Bryan Smith
Research Category: HEALTH AND BIOMEDICAL
Keywords: CANCER METASTASIS, CYTOSKELETAL BEHAVIOR, MICRORHEOLOGY

Poster Number: S2-C10
Authors: Chenyang Deng; Annick Anctil
Title: ESTIMATION OF REPOWERED PHOTOVOLTAIC MODULES OF UTILITY SCALE SOLAR PLANT IN UNITED STATES
Advisor: Annick Anctil
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: PHOTOVOLTAIC REPOWERING, CAPACITY FACTOR, PHOTOVOLTAIC MODULE DEGRADATION
Poster Number: S2-C11
Authors: Mostafa Fereydoonian; Woongkul Lee
Title: HIGH POWER DENSITY RARE-EARTH MAGNET-FREE WOUND-FIELD FLUX SWITCHING MACHINES WITH OPTIMAL WINDING AND ROTOR DESIGN
Advisor: Woongkul Lee
Research Category: MOBILITY AND ROBOTICS
Keywords: POWER DENSITY, SALIENT ROTOR, MUTUAL INDUCTANCE

Poster Number: S2-C12
Authors: Meicai Xu; Sibel Uludag-Demirer; Yurui Zheng; Yan Liu; Wei Liao
Title: STANDARDIZING THE SEED PREPARATION FOR BIO-METHANE POTENTIAL MEASUREMENT
Advisor: Wei Liao
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: SEED PREPARATION, BIOMETHANE POTENTIAL, STANDARDIZATION

Poster Number: S2-C13
Authors: Logan Crooks; Ian Morris; Kai Klink; Michael Costello; Shannon S. Nicley; Jonas N. Becker
Title: COMPARATIVE SPECTROSCOPIC STUDY OF Er:YSO AND ErCl3 FOR QUANTUM INFORMATION TECHNOLOGIES
Advisor: Jonas Becker
Research Category: MATERIALS, MECHANICS AND ADVANCED MANUFACTURING
Keywords: QUANTUM INFORMATION PROCESSING, STOICHIOMETRIC RARE EARTH CRYSTALS, SPECTROSCOPIC

Poster Number: S2-C14
Authors: Yan Xie; Scott Calabrese Barton
Title: MOLECULAR TUNNELING MECHANISM OF NH3 TRANSPORT IN ASPARAGINE SYNTHETASE
Advisor: Scott Calabrese Barton
Research Category: HEALTH AND BIOMEDICAL
Keywords: MOLECULAR DYNAMICS, SUBSTRATE CHANNELING, UMBRELLA SAMPLING

Poster Number: S2-C15
Authors: Brenden Kelley; Qiben Yan
Title: UTILIZING IOT-BASED SOIL MOISTURE MONITORING SYSTEM TO IMPROVE IRRIGATION WATER USE EFFICIENCY
Advisor: Younsuk Dong
Research Category: SMART AG
Keywords: IRRIGATION, IOT, WATER USE EFFICIENCY
This work is supported by the USDA NRCS and Michigan Soybean Commission.
Poster Number: S2-C16
Authors: Nikolay Ivanov; Qiben Yan
Title: ATTACKING HARDWARE WALLETS USING SOCIAL ENGINEERING AND CRYPTOGRAPHIC PRECOMPUTATION
Advisor: Qiben Yan
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: SECURITY, BLOCKCHAIN, HARDWARE WALLETS

Poster Number: S2-C17
Authors: Annie Needs; Joelle Eaves; Sam Schmidt; Shivangi Chugh; Po-Han Lin; Fei Fan; Athar Nakisa; Xuefei Huang; Daniel R. Woldring
Title: RATIONALLY-EVOLVED ANTIBODIES: TARGETING NEUROBLASTOMA USING HIGH-THROUGHPUT APPROACHES
Advisor: Daniel Woldring
Research Category: HEALTH AND BIOMEDICAL
Keywords: PROTEIN ENGINEERING, ANTIBODIES, CANCER

Poster Number: S2-C18
Authors: Hamid Mozafari; Amirali Soltanpour; Farish Jazlan; Mehrnaz Ghamami; Ali Zockaie
Title: IMPACTS OF COVID-19 PANDEMIC ON UNIVERSITY FLEET OPERATIONS AND MANAGEMENT STRATEGIES CONSIDERING ENVIRONMENTAL CONCERNS
Advisor: Mehrnaz Ghamami
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: COVID-19 PANDEMIC, FLEET OPERATIONS, STATISTICAL DATA ANALYSIS

Poster Number: S2-C19
Authors: Yihua Zhang; Guanhua Zhang; Yang Zhang; Sijia Liu; Shiyu Chang
Title: FAIRNESS REPROGRAMMING
Advisor: Sijia Liu
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: FAIR ARTIFICIAL INTELLIGENCE, MODEL REPROGRAMMING, VISUAL PROMPTING

Poster Number: S2-C20
Authors: Allie VanZanten; William Gaal; Karolina Colon-Rivera; Caroline Szczepanski
Title: INVESTIGATING THE TRANSIENT SWELLING MECHANICS OF PEG-BASED HYDROGELS
Advisor: Caroline Szczepanski
Research Category: MATERIALS, MECHANICS AND ADVANCED MANUFACTURING
Keywords: HYDROGEL, SWELLING, WRINKLES
Poster Number: S2-C21
Authors: Sandeep Banik; Shaunak D. Bopardikar
Title: FLIPDYN: A GAME OF RESOURCE TAKEOVERS IN DYNAMICAL SYSTEMS
Advisor: Shaunak D. Bopardikar
Research Category: MOBILITY AND ROBOTICS
Keywords: GAME THEORY, DISCRETE TIME SYSTEMS, CYBER-PHYSICAL SYSTEM SECURITY
This work is supported by the National Science Foundation Award CNS-2134076 under the Secure and Trustworthy Cyberspace (SaTC) program.

Poster Number: S2-C22
Authors: Vicente Amado Olivo; Wolfgang Kerzendorf
Title: READING BETWEEN THE STARS: AUTOMATED EXTRACTION OF SPACE TELESCOPE USAGE INFORMATION FROM SCIENTIFIC PUBLICATIONS USING NATURAL LANGUAGE PROCESSING
Advisor: Wolfgang Kerzendorf
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: META-RESEARCH, MACHINE LEARNING, BIG DATA

Poster Number: S2-C23
Authors: Michael Hayes; André Bénard
Title: ASSESSING CONTROL STRATEGIES FOR HIGH-TEMPERATURE GAS EXTRACTION FROM A NOVEL THERMOCHEMICAL OXIDATION REACTOR
Advisor: André Bénard
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: STORAGE, RENEWABLE, HIGH TEMPERATURE
This work is supported by the Department of Energy.

Poster Number: S2-C24
Authors: Everett Baxter; Erik Shapiro; Assaf Gilad
Title: DIRECT TRANSPORT OF HARMINE USING ORGANIC ANION TRANSPORTER PROTEIN 1B3
Advisor: Assaf Gilad
Research Category: HEALTH AND BIOMEDICAL
Keywords: TYPE 1 DIABETES, OATP1B3, HARMINE
**Poster Number:** S2-C25  
**Authors:** Dar Tafazul Islam; Mohsen Faghihinezhad; Brian J. Teppen; Cliff T. Johnston; Hui Li; Stephen A. Boyd; Gerben J. Zylstra; Donna E. Fennel; Alison M. Cupples; Syed A. Hashsham  
**Title:** TOWARDS A COMPREHENSIVE MODEL FOR PREDICTING TOXIC EQUIVALENTS (TEQ) REDUCTION IN RESPONSE TO BIOTIC AND ABIOTIC INTERVENTIONS AT POLYCHLORINATED DIBENZO-P-DIOXIN AND DIBENZOFURANS (PCDD/Fs)-CONTAMINATED SITES  
**Advisor:** Syed Hashsham  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** POLYCHLORINATED DIBENZO-P-DIOXIN AND DIBENZOFURANS (PCDD/Fs), TOXIC EQUIVALENTS (TEQs), BIOSTIMULATION, ADSORPTION  
This work is supported by the Superfund Research Project.

**Poster Number:** S2-C26  
**Authors:** Ahmed Elkouk; Yadu Pokhrel; Lifeng Luo; Elizabeth Payton; Ben Livneh  
**Title:** A SYSTEMS MODELING APPROACH TO EXAMINE WATER AND ENVIRONMENTAL SUSTAINABILITY PATHWAYS IN THE SOUTHWESTERN U.S.  
**Advisor:** Yadu Pokhrel  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** WATER, MODELING, SOUTHWESTERN U.S.  
This work is supported by the National Science Foundation (Award #2103030).

**Poster Number:** S2-C27  
**Authors:** Christian Luedtke; Xiaobo Tan  
**Title:** FLEXIBLE SENSOR ARRAYS BASED ON PVC GELS  
**Advisor:** Xiaobo Tan  
**Research Category:** MATERIALS, MECHANICS AND ADVANCED MANUFACTURING  
**Keywords:** SMART MATERIALS, PVC GEL, SENSING  
This work is supported by the Toyota Motor Engineering & Manufacturing North America, Inc.
Poster Number: S2-C28
Authors: Paul Schulman; Xiaobo Tan
Title: INDIVIDUAL BLADE CONTROL FOR MARTIAN ROTORCRAFT
Advisor: Xiaobo Tan
Research Category: MOBILITY AND ROBOTICS
Keywords: SPACE, ROTORCRAFT, EXPLORATION

Poster Number: S2-C29
Authors: Michelle Kim; Kristen Johnson
Title: CLoSE: CONTRASTIVE LEARNING OF SUBFRAME EMBEDDINGS FOR POLITICAL BIAS CLASSIFICATION OF NEWS MEDIA
Advisor: Kristen Johnson
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: NATURAL LANGUAGE PROCESSING; COMPUTATIONAL SOCIAL SCIENCE; POLITICAL FRAMING

Poster Number: S2-C30
Authors: Narindra Randriamiarintsoa; Bradley Marks
Title: EVALUATION OF THE EFFECTIVENESS OF APPLE DRYING CONDITIONS ON PATHOGEN CONTROL USING QUANTITATIVE MICROBIAL RISK ASSESSMENT
Advisor: Bradley Marks
Research Category: HEALTH AND BIOMEDICAL
Keywords: APPLE DRYING, RISK ASSESSMENT, LISTERIA
This work is supported by the USDA National Institute for Food and Agriculture (NIFA) Grants No. 2020-68012-31822.

Poster Number: S2-C31
Authors: Kay Hadrick; Ian Carley; Seock-Jin Chung; Meghan Hill; Hyeon-Joo Woo; Irina Kalashnikova; Taeho Kim
Title: SYNTHESIS OF ALBUMIN-NANOCERIA WITH CONTROLLED VALENCE STATE AND ITS EFFECTS ON MACROPHAGE DIFFERENTIATION
Advisor: Taeho Kim
Research Category: HEALTH AND BIOMEDICAL
Keywords: NANOZYME, MACROPHAGE, MODULATION
Poster Number: S2-C32
Authors: Protichi Basak; Arun Ross
Title: MORPHED FACE ATTACK DETECTION
Advisor: Arun Ross
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: FACE BIOMETRICS, AUTHENTICATION THREAT, IMAGE ANALYSIS
This work is supported by the Department of Homeland Security.

Poster Number: S2-C33
Authors: E. Alejandro Castellanos Franco; Assaf Gilad
Title: UTILIZING GENETIC CIRCUITS FOR CONTROL OF GENE EXPRESSION
Advisor: Assaf Gilad
Research Category: HEALTH AND BIOMEDICAL
Keywords: SYNTHETIC BIOLOGY, PROTEIN ENGINEERING,

Poster Number: S2-C34
Authors: Xuyang Li; Nizar Lajnef
Title: NEURALSI: STRUCTURAL PARAMETER IDENTIFICATION IN NONLINEAR DYNAMICAL SYSTEMS
Advisor: Nizar Lajnef
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: STRUCTURAL SYSTEM IDENTIFICATION, PHYSICS-INFORMED MACHINE LEARNING, STRUCTURAL HEALTH MONITORING
This work is supported by the National Science Foundation.

Poster Number: S2-C35
Authors: Magdalena Cavka; Timothy Gates
Title: EFFECT OF CHEVRON DESIGN ON DRIVER BEHAVIOUR TRAVERSING SHARP HORIZONTAL CURVES
Advisor: Timothy Gates
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: CHEVRON SIGNS, TRAFFIC SAFETY, HORIZONTAL CURVES

Poster Number: S2-C36
Authors: Gautam Sreekumar; Bashir Sadeghi; Vishnu Boddeti
Title: REPRESENTATION LEARNING FROM INTERVENTIONAL DATA
Advisor: Vishnu Boddeti
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: DEEP LEARNING, REPRESENTATION LEARNING, CAUSALITY
Poster Number: S2-C37
Authors: Md Alamin; Kevin Liu
Title: IMPACT OF NON TREE LIKE EVOLUTION ON PHYLOGENETIC TREE PLACEMENT
Advisor: Kevin Liu
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: PHYLOGENETIC PLACEMENT, HORIZONTAL GENE TRANSFER, DELTA ERRORS

Poster Number: S2-C38
Authors: Celso Santos; Bora Cetin
Title: INCREASING THE LIFE SPAN OF MICHIGAN PAVEMENT
Advisor: Bora Cetin
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: GEOTECHNICS, PAVEMENT, OPTIMIZATION

Poster Number: S2-C39
Authors: Sarah Wright; Michele Grimm
Title: DEVELOPMENT OF THREE-DIMENSIONAL NEONATAL BRACHIAL PLEXUS FINITE ELEMENT MODEL.
Advisor: Michele Grimm
Research Category: HEALTH AND BIOMEDICAL
Keywords: BIOMECHANICS, INJURY MECHANICS, NEONATAL
This work is supported by the National Science Foundation Award CBET 2028474.

Poster Number: S2-C40
Authors: Cathy Bing; Philip Eisenlohr
Title: EXPLICIT SEPARATION OF EDGE AND SCREW DISLOCATION MOBILITY AND DENSITY EVOLUTION LAW IN BCC SINGLE CRYSTAL PLASTICITY MODEL
Advisor: Philip Eisenlohr
Research Category: MATERIALS, MECHANICS AND ADVANCED MANUFACTURING
Keywords: CRYSTAL PLASTICITY MODEL, CONSTITUTIVE DESCRIPTION, EDGE-SCREW CHARACTERIZATION
This work is supported by the Department of Energy DE-SC0009960.

Poster Number: S2-C41
Authors: Amirali Soltanpour; Alireza Rostami; Mehrnaz Ghamami; Ali Zockaie
Title: ELECTRIFYING TRAVELS ALONG LAKE MICHIGAN CIRCUIT
Advisor: Mehrnaz Ghamami
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: ELECTRIC VEHICLE, CHARGING INFRASTRUCTURE, MATHEMATICAL PROGRAMMING
This work is supported by the Michigan Department of Environment, Great Lakes, and Energy (EGLE).
Poster Number: S2-C42
Authors: Ryan Ashbaugh; Yiyang Su; Minchul Kim; Feng Liu; Xiaoming Liu; Arun Ross
Title: FUSION OF FACE, GAIT AND BODY FOR LONG RANGE AND HIGH ALTITUDE HUMAN RECOGNITION
Advisor: Arun Ross
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: BIOMETRICS, FUSION, RECOGNITION
This work is supported by the Intelligence Advanced Research Projects Activity (IARPA).

Poster Number: S2-C43
Authors: Kasey Nelson; Ian Klug; Yawei Lin; Dangkamol Wongthanaroj; Yunwei Chen; Kirk Dolan; Teresa Bergholz; Ian Hildebrandt; Michael James; Bradley Marks
Title: MODELING AND OPTIMUM EXPERIMENTAL DESIGN OF SALMONELLA INACTIVATION IN INOCULATED WHEAT FLOUR
Advisor: Bradley Marks
Research Category: SMART AG
Keywords: LOW-MOISTURE FOODS, INACTIVATION MODELS, WHEAT FLOUR
This work is supported by the USDA NIFA AFRI SAS.

Poster Number: S2-C44
Authors: Sunanda Dey; David P. Hickey; Daniel R. Woldring
Title: MODIFYING SMALL PROTEINS TO CREATE A NOVEL PROTEIN-ELECTRODE SENSING INTERFACE
Advisor: David Hickey
Research Category: HEALTH AND BIOMEDICAL
Keywords: BIOSENSOR, ELECTROCHEMICAL MODIFICATION, PROTEIN ENGINEERING

Poster Number: S2-C45
Authors: Md Fyaz Sadiq; Mohammad Wasif Naqvi; Bora Cetin; John Daniels
Title: UNLOCKING A SMOOTHER RIDE: MITIGATING PAVEMENT DAMAGE WITH ENGINEERED WATER REPELLENCY
Advisor: Bora Cetin
Research Category: MOBILITY AND ROBOTICS
Keywords: PAVEMENT, FROST HEAVE DAMAGE, WATER REPELLANT CHEMICALS

Poster Number: S2-C46
Authors: Xiaoqiang “Antonio” Ni; Brennan Sollenberger
Title: INVESTIGATING THERMAL AND MECHANICAL PROPERTIES OF PHASE CHANGE MATERIALS INCORPORATED CONCRETE
Advisor: Qingxu “Bill” Jin
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: PHASE CHANGE MATERIAL, DEICING, PAVEMENT
This work is supported by the Illinois Tollway.
**Poster Number:** S2-C47  
**Authors:** Demetris Coleman; Shaunak Bopardikar; Vaibhav Srivastava; Xiaobo Tan  
**Title:** EXPLORATION OF UNKNOWN SCALAR FIELDS UNDER LOCALIZATION UNCERTAINTY  
**Advisor:** Xiaobo Tan  
**Research Category:** MOBILITY AND ROBOTICS  
**Keywords:** ROBOTICS, CONTROL, AQUATIC  
This work is supported by the National Science Foundation.

**Poster Number:** S2-C48  
**Authors:** Raul Quispe-Abad; Arun Ross  
**Title:** BLACK ICE AND SNOW DETECTION FROM AUTOMOBILES USING CONVOLUTION NEURAL NETWORKS  
**Advisor:** Arun Ross  
**Research Category:** MOBILITY AND ROBOTICS  
**Keywords:** BLACK ICE, CONVOLUTION NEURAL NETWORK, SEMANTIC SEGMENTATION  
This work is supported by the Ford Company.

**Poster Number:** S2-C49  
**Authors:** Redwan Sony; Clara Devota; Carolyn Isaac; Todd W. Fenton; Joseph Hefner; Arun Ross  
**Title:** DEEP LEARNING APPROACHES TO COMPARATIVE MEDICAL RADIOGRAPHY WITH CHEST RADIOGRAPHS  
**Advisor:** Arun Ross  
**Research Category:** COMPUTATIONAL AND INFORMATIONAL SYSTEMS  
**Keywords:** FORENSIC IDENTIFICATION, COMPARATIVE RADIOGRAPHY, DEEP LEARNING  
This work is supported by the MSU Strategic Partnership Grant.

**Poster Number:** S2-C50  
**Authors:** Saad Alzahrani; Joydeep Mitra  
**Title:** MAS- ASSISTED MICROGRID PROTECTION USING STATE OBSERVER  
**Advisor:** Joydeep Mitra  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** FAULT DETECTION, MULTI-AGENT SYSTEM (MAS), STATE OBSERVER

**Poster Number:** S2-C51  
**Authors:** Sakar Pahari; Md Shakir Mahmud; Sagar Keshari; Myles Overall; Sarah Premo; Timothy Gates; Peter Savolainen  
**Title:** EVALUATION OF DIGITAL SPEED LIMIT SIGNS IN FREEWAY WORK ZONES  
**Advisor:** Timothy Gates  
**Research Category:** MOBILITY AND ROBOTICS  
**Keywords:** WORK ZONE SPEED MANAGEMENT, DRIVER BEHAVIOR, WORK ZONE SAFETY
POSTER SESSION 2
POSTER GROUP D
11:00AM – 12:30PM
2200 HALLWAY AND 2500 HALLWAY
Poster Number: S2-D1
Authors: Jiaxu Cai; Yuzhen Lu
Title: BEEF MARBLING ASSESSMENT BY STRUCTURED ILLUMINATION REFLECTANCE IMAGING WITH MACHINE LEARNING
Advisor: Yuzhen Lu
Research Category: SMART AG
Keywords: GRADING, BEEF MARBLING, SINUSOIDAL ILLUMINATION

Poster Number: S2-D2
Authors: Yoganandh Madhuranthakam; Sunil Chakrapani
Title: NONLINEAR WAVES IN MULTILAYER MEDIA
Advisor: Sunil Chakrapani
Research Category: MATERIALS, MECHANICS AND ADVANCED MANUFACTURING
Keywords: NONLINEAR WAVES, MULTILAYER, ACOUSTIC NONLINEARITY PARAMETER

Poster Number: S2-D3
Authors: Omid Bagheri; Yadu Pokhrel; Nathan Moore; Mantha S. Phanikumar
Title: INVESTIGATING DOMINANT HYDROLOGICAL PROCESSES IN THE AMAZON RIVER BASIN TO INFORM SUSTAINABLE MANAGEMENT PRACTICES
Advisor: Yadu Pokhrel
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: AMAZON BASIN, PROCESS-BASED MODELING, FOREST MANAGEMENT
This work is supported by the National Science Foundation (CAREER, Award #1752729 and INFEWS, Award #1639115).

Poster Number: S2-D4
Authors: Joelle Eaves; Daniel Woldring; Assaf Gilad
Title: OPTIMIZING AN ELECTROMAGNETICALLY CONTROLLED SPLIT HALOTAG SYSTEM
Advisor: Assaf Gilad
Research Category: HEALTH AND BIOMEDICAL
Keywords: PROTEIN ENGINEERING, BIOMEDICAL, SYNTHETIC BIOLOGY

Poster Number: S2-D5
Authors: Kaisen Lin; Zhouyuan Wang
Title: THE DETECTION OF RESPIRATORY VIRUSES IN HEATING, VENTILATION, AND AIR CONDITIONING UNITS OF UNIVERSITY BUILDINGS
Advisor: Kaisen Lin
Research Category: HEALTH AND BIOMEDICAL
Keywords: HAVC, RESPIRATORY VIRUSES, MONITORING
**Poster Number:** S2-D6  
**Authors:** Mikayla Benson; Woongkul Lee  
**Title:** Neutral-Point-Less (NPL) Multilevel Inverter with Discontinuous Pulse Width Modulations: X-type Inverter  
**Advisor:** Woongkul Lee  
**Research Category:** Sustainability: Infrastructure, Environment, Energy and Water  
**Keywords:** Inverter, Neutral-point-less, Pulse width modulation

**Poster Number:** S2-D7  
**Authors:** Boyang Deng; Yuzhen Lu  
**Title:** Object Detection and Counting by Deep Learning in Dense, Unstructured Agricultural Environments  
**Advisor:** Yuzhen Lu  
**Research Category:** Smart AG  
**Keywords:** Object detection, Deep learning, Unstructured Agricultural Environments, Smart Agriculture

**Poster Number:** S2-D8  
**Authors:** Vishal Asnani; Xi Yin; Tal Hassner; Sijia Liu; Xiaoming Liu  
**Title:** Proactive Image Manipulation Detection  
**Advisor:** Xiaoming Liu  
**Research Category:** Computational and Informational Systems  
**Keywords:** Proactive, manipulation, detection

**Poster Number:** S2-D9  
**Authors:** Hrishikesh Dutta; Amit Kumar Bhuyan; Subir Biswas  
**Title:** Towards a Contextual Deep Reinforcement Learning Architecture for Energy Management in Wireless Networks  
**Advisor:** Subir Biswas  
**Research Category:** Computational and Informational Systems  
**Keywords:** Wireless networks, Energy Efficiency, Deep Q Learning

**Poster Number:** S2-D10  
**Authors:** Jiabin Liu; Aditya Tarle; Sean Blanchard; Shaoting Lin  
**Title:** Fatigue Resistance Color-Changing Soft Materials  
**Advisor:** Shaoting Lin  
**Research Category:** Materials, Mechanics and Advanced Manufacturing  
**Keywords:** Photoelasticity, Entanglement, Fatigue-resistance
Poster Number: S2-D11
Authors: Preet Lal; Gurjeet Singh; Narendra Das; Dara Entekhabi
Title: A DATA-DRIVEN SNAPSHOT ALGORITHM FOR HIGH-RESOLUTION SOIL MOISTURE RETRIEVALS FOR THE UPCOMING NISAR MISSION
Advisor: Narendra Das
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: REMOTE SENSING, NISAR, SOIL MOISTURE
This work is supported by the Jet Propulsion Laboratory, NASA.

Poster Number: S2-D12
Authors: Omkar Ramachandran; Balasubramaniam Shanker
Title: A PARAMETER EXTRACTION TECHNIQUE FOR ELECTROMAGNETIC FINITE ELEMENT PARTICLE-IN-CELL SIMULATIONS.
Advisor: Balasubramaniam Shanker
Research Category: APPLIED ELECTROMAGNETICS
Keywords: PARTICLE-IN-CELL, FINITE ELEMENT METHODS, COMPUTATIONAL PLASMA PHYSICS

Poster Number: S2-D13
Authors: Siddhesh Mane; Anant Kanungo; Gurjeet Singh; Narendra N Das
Title: DEVELOPMENT OF LOW-COST HANDHELD SOIL MOISTURE MEASUREMENT DEVICE FOR FARMERS AND CITIZEN SCIENTISTS
Advisor: Narendra Das
Research Category: SMART AG
Keywords: SOIL MOISTURE, MEASUREMENT, CALIBRATION
This work is supported by the The National Aeronautics and Space Administration.

Poster Number: S2-D14
Authors: Amit Kumar Bhuyan; Hrishikesh Dutta; Subir Biswas
Title: MULTI-ARMED BANDIT BASED LEARNING IN UAV-aided CONTENT CACHING IN COMMUNICATION-CHALLENGED ENVIRONMENTS
Advisor: Subir Biswas
Research Category: MOBILITY AND ROBOTICS
Keywords: DISASTER CONTENT CACHING, UNMANNED AERIAL VEHICLES, REINFORCEMENT LEARNING
This work is supported by the National Science Foundation.
**Poster Number:** S2-D15  
**Authors:** Subal Sharma; Firas Khasawneh; Sunil Kishore Chakrapani  
**Title:** CLASSIFICATION OF DIFFERENT HEAT TREATMENTS OF MARTENSITIC STEEL USING MACHINE LEARNING AIDED DIFFUSE FIELD ULTRASONIC  
**Advisor:** Sunil Kishore Chakrapani  
**Research Category:** MATERIALS, MECHANICS AND ADVANCED MANUFACTURING  
**Keywords:** DIFFUSE FIELD ULTRASONIC, DECISION TREE, MACHINE LEARNING

**Poster Number:** S2-D16  
**Authors:** Mohammad Wasif Naqvi; Md Fyaz Sadiq; Bora Cetin  
**Title:** INNOVATIVE SOLUTIONS TO MIDWEST ROAD PROBLEMS  
**Advisor:** Bora Cetin  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** ROADS, FROST HEAVE, MOISTURE, COLD CLIMATE  
This work is supported by the National Science Foundation (Award No. - 1947009).

**Poster Number:** S2-D17  
**Authors:** Marya Andleeb; Mikayla Benson; Woongkul Lee  
**Title:** CARRIER BASED PWM TECHNIQUE FOR SINGLE STAGE THREE-PHASE RECTIFIER INDIRECT MATRIX CONVERTER  
**Advisor:** Woongkul Lee  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** ELECTRIC VEHICLES, DC FAST CHARGING, MATRIX CONVERTER

**Poster Number:** S2-D18  
**Authors:** Guangyue Xu; Parisa Kordjamshidi; Joyce Chai  
**Title:** GIPCOL: GRAPH-INJECTED SOFT PROMPTING FOR COMPOSITIONAL ZERO-SHOT LEARNING  
**Advisor:** Parisa Kordjamshidi  
**Research Category:** COMPUTATIONAL AND INFORMATIONAL SYSTEMS  
**Keywords:** PROMPT LEARNING, COMPOSITIONAL LEARNING, VISUAL-LANGUAGE MODELS

**Poster Number:** S2-D19  
**Authors:** Piyush Gupta; Sangjae Bae; Vaibhav Srivastava  
**Title:** INTERACTION-AWARE TRAJECTORY PLANNING FOR AUTONOMOUS VEHICLES WITH ANALYTIC INTEGRATION OF NEURAL NETWORK WITH MODEL PREDICTIVE CONTROL  
**Advisor:** Vaibhav Srivastava  
**Research Category:** MOBILITY AND ROBOTICS  
**Keywords:** AUTONOMOUS DRIVING, INTERACTION-AWARE, MODEL PREDICTIVE CONTROL
**Poster Number:** S2-D20  
**Authors:** Robert Kuphal; Fang ChengCheng  
**Title:** LITHIUM METAL BATTERY LIFE CYCLE AND CAPACITY LOADING RELATIONSHIP  
**Advisor:** ChengCheng Fang  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** BATTERY, LITHIUM, ENERGY

**Poster Number:** S2-D21  
**Authors:** Aakash Khandelwal; Nilay Kant; Ranjan Mukherjee  
**Title:** TIPTOEING: IMPACT-FREE GAITS FOR PLANAR BIPEDS  
**Advisor:** Ranjan Mukherjee  
**Research Category:** MOBILITY AND ROBOTICS  
**Keywords:** VIRTUAL HOLONOMIC CONSTRAINTS, ORBITAL STABILIZATION, IMPULSIVE INPUTS  
This work is supported by the National Science Foundation.

**Poster Number:** S2-D22  
**Authors:** Mahya G.Z Hashemi; Narendra N Das; Paul Siqueira  
**Title:** THE IMPACT OF CROP ROTATION ON CROP ATTRIBUTES DETECTION USING SENTINEL-1A OBSERVATIONS  
**Advisor:** Narendra Das  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** CROP ROTATION, RADAR, DEEP LEARNING  
This work is supported by the SERVIR project from NASA.

**Poster Number:** S2-D23  
**Authors:** Huy Dang; Yadu Pokhrel  
**Title:** ARE HYDROPOWER DAMS MITIGATING ADVERSE IMPACTS OF FLOOD AND DROUGHT IN SOUTHEAST ASIA?  
**Advisor:** Yadu Pokhrel  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** HYDROPOWER, FLOOD, DROUGHT  
This work is supported by the National Science Foundation and the Henry Luce Foundation.
**Poster Number:** S2-D24  
**Authors:** Kevin Chen; Sean Foster; Caleb Sandum; Sardar Murtaza; Elaina Gouin; S. Patrick Walton; Christina Chan  
**Title:** THE ROLE OF IRE1A IN HISTONE REGULATION, DNA DAMAGE REPAIR AND CHEMO-TOLERANCE  
**Advisor:** Christina Chan  
**Research Category:** HEALTH AND BIOMEDICAL  
**Keywords:** CANCER, DRUG RESISTANCE, DNA REPAIR  
This work is supported by the Integrative Pharmacological Sciences Training Program (NIH T32) and NSF CBET 1802992 and CBET 2029319.

**Poster Number:** S2-D25  
**Authors:** Cort Thompson; Blake Evans; Dorothy Zhao; Erin Purcell  
**Title:** SPATIOTEMPORAL EXPRESSION OF RNA-SEQ IDENTIFIED PROTEINS AT THE ELECTRODE INTERFACE  
**Advisor:** Erin Purcell  
**Research Category:** HEALTH AND BIOMEDICAL  
**Keywords:** NEURAL PROSTHESES, TISSUE RESPONSE, PROTEIN EXPRESSION  
This work is supported by the National Science Foundation.

**Poster Number:** S2-D26  
**Authors:** Dong Hae Mangaland; Ericka Rovira; Vaibhav Srivastava  
**Title:** ON TRUST-AWARE ASSISTANCE-SEEKING IN HUMAN-SUPERVISED AUTONOMY  
**Advisor:** Vaibhav Srivastava  
**Research Category:** SMART AG  
**Keywords:** HUMAN IN THE LOOP, AUTONOMOUS SYSTEMS, MARKOV PROCESSES  
This work is supported by the National Science Foundation award ECCS 2024649.

**Poster Number:** S2-D27  
**Authors:** Babak Dialameh; Ehsan Ghane  
**Title:** HIGH-FREQUENCY MONITORING OF SUBSURFACE DRAINAGE DISCHARGE PROVIDES INSIGHT INTO PHOSPHORUS TRANSPORT DYNAMICS  
**Advisor:** Ehsan Ghane  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** CHEMODYNAMIC, HYSTERESIS, TOTAL REACTIVE PHOSPHORUS  
This work is supported by the Michigan Department of Agriculture and Rural Development (MDARD).
**Poster Number:** S2-D28  
**Authors:** Myles Wayne Overall; Timothy Gates  
**Title:** USING LAW ENFORCEMENT TO ENHANCE THE EFFECTIVENESS OF SPEED FEEDBACK TRAILERS IN WORK ZONES  
**Advisor:** Timothy Gates  
**Research Category:** MOBILITY AND ROBOTICS  
**Keywords:** SAFETY, WORK ZONES, LAW ENFORCEMENT  
This work is supported by the Michigan Department of Transportation.

**Poster Number:** S2-D29  
**Authors:** Lincoln Mtemeri; David Hickey  
**Title:** MODEL-DRIVEN DESIGN OF MOLECULAR ELECTRODES FOR BIOENERGY APPLICATIONS: QUANTIFYING THE IMPACT OF QUINONE STRUCTURE ON MEDIATED ELECTRON TRANSFER.  
**Advisor:** David Hickey  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** BIOFUEL CELLS, ELECTROCATALYSIS, REDOX ENZYMES

**Poster Number:** S2-D30  
**Authors:** Preston Fairchild; Noah Shepard; Yu Mei; Xiaobo Tan  
**Title:** A POSITION AND STIFFNESS MODEL FOR PNEUMATIC 3D SOFT ROBOTIC MANIPULATORS  
**Advisor:** Xiaobo Tan  
**Research Category:** MOBILITY AND ROBOTICS  
**Keywords:** SOFT ROBOTICS, MODELING, CONTROL  
This work is supported by the National Science Foundation.

**Poster Number:** S2-D31  
**Authors:** Abhinav Kumar; Garrick Brazil; Enrique Corona; Armin Parchami; Xiaoming Liu  
**Title:** DEVIANT: DEPTH EQUIVARIANT NETWORK FOR MONOCULAR 3D OBJECT DETECTION  
**Advisor:** Xiaoming Kumar  
**Research Category:** MOBILITY AND ROBOTICS  
**Keywords:** 3D DETECTION, AUTONOMOUS DRIVING, EQUIVARIANCE  
This work is supported by the Ford Motor Company, Army Research Office (ARO) W911NF-18-1-0330.
Poster Number: S2-D32
Authors: Akinfolarin Abatan; Sunday Imosemi; Peter Savolainen
Title: SAFETY IMPACTS OF SPEED-CHANGE LANES AT HIGHWAY INTERCHANGES
Advisor: Peter Savolainen
Research Category: MOBILITY AND ROBOTICS
Keywords: TRAFFIC, SAFETY, HIGHWAY
This work is supported by the American Association of State Highway and Transportation Officials (AASHTO).

Poster Number: S2-D33
Authors: Vittorio Mottini; Charlie Meilinger; Liuxi Xing; Jinxing Li
Title: SOFT BIOELECTRONICS AS PRECISION NEURAL INTERFACES
Advisor: Jinxing Li
Research Category: HEALTH AND BIOMEDICAL
Keywords: NEURAL ENGINEERING, HUMAN-MACHINE INTERFACE, STRETCHABLE BIOELECTRONICS

Poster Number: S2-D34
Authors: Gabriel Maliakal; Adam Alessio; Saiprasad Ravishankar
Title: RECONSTRUCTING EDGES FROM SPARSE RADIOGRAPHIC MEASUREMENTS
Advisor: Adam Alessio Saiprasad Ravishankar
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: INVERSE PROBLEMS, RECONSTRUCTION, CT, XRAY

Poster Number: S2-D35
Authors: Ankush Jha; Nizar Lajnef; Venkatesh Kodur
Title: ENHANCING EFFICIENCY OF EMERGENCY EVACUATION THROUGH REAL TIME SENSING
Advisor: Nizar Lajnef
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: EMERGENCY EVACUATION, SITUATIONAL AWARENESS, SENSORS

Poster Number: S2-D36
Authors: Isaac Thompson; Donghae Mangalindan; Max Verboncoeur; Sadie Shen; Qi Dai; Suzhou Huang; Yan Wang; Vaibhav Srivastava; Xiaobo Tan
Title: EXPERIMENTAL IMPLEMENTATION OF SCALED AUTONOMOUS VALET PARKING SYSTEM
Advisor: Xiaobo Tan
Research Category: MOBILITY AND ROBOTICS
Keywords: AUTONOMOUS PARKING, KINEMATICS, MECHATRONICS
This work is supported by the Ford Motor Company.
Poster Number: S2-D37
Authors: Yue Zhang; Parisa Kordjamshidi
Title: LOVIS: LEARNING ORIENTATION AND VISUAL SIGNALS FOR VISION AND LANGUAGE NAVIGATION
Advisor: Parisa Kordjamshidi
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: VISION AND LANGUAGE, MULTIMODAL REASONING, EMBODIED AI

Poster Number: S2-D38
Authors: Avirup Roy; Hrishikesh Dutta; Amit Bhuyan; Subir Kumar Biswas
Title: A SMART BOTTLE ARCHITECTURE USING ITERATIVE SEMI SUPERVISED LEARNING.
Advisor: Subir Biswas
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: SEMI-SUPERVISED LEARNING, SELF-LEARNING, SMART BOTTLE

Poster Number: S2-D39
Authors: Eric Gaskell; Tyler Funnel; Christopher Holbrook; Darryl Hondorp; Xiaobo Tan
Title: CHARACTERIZATION OF ACOUSTIC DETECTION EFFICIENCY USING AN UNMANNED SURFACE VEHICLE AS A MOBILE RECEIVER PLATFORM
Advisor: Xiaobo Tan
Research Category: MOBILITY AND ROBOTICS
Keywords: MARINE ROBOTICS, ACOUSTIC TELEMETRY, AUTONOMOUS ROBOTICS
This work is supported by the Great Lakes Fishery Commission (Grant 2022_TAN_441020).

Poster Number: S2-D40
Authors: Shivam Bajaj; Eric Torng; Shaunak D. Bopardikar
Title: AUTONOMOUS PERIMETER DEFENSE: A COMPETITIVE ANALYSIS APPROACH
Advisor: Dr. Shaunak D. Bopardikar
Research Category: MOBILITY AND ROBOTICS
Keywords: AUTONOMOUS AGENTS, PERIMETER DEFENSE, ONLINE OPTIMIZATION
This work is supported by the Aerospace Systems Technology Research and Assessment (ASTRA) Aerospace Technology Development and Testing (ATDT) program at AFRL under contract number FA865021D2602.
Poster Number: S2-D41
Authors: Guangjing Wang; Hanqing Guo; Anran Li; Xiaorui Liu; Qiben Yan
Title: FEDERATED IOT INTERACTION VULNERABILITY ANALYSIS
Advisor: Qiben Yan
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: SMART HOME, VULNERABILITY ANALYSIS, FEDERATED GRAPH LEARNING
This work is supported by the National Science Foundation grants CNS-1950171, and Michigan State University’s Institute for Cyber-Enabled Research Cloud Computing Fellowship, with computational resources and services provided by Information Technology Services and the Office of Resear

Poster Number: S2-D42
Authors: Ian Morris; Kai Klink; Logan Crooks; Leeju Singh; David Hardeman; Ofer Firstenberg; Shannon S. Nicole; Eilon Poem; Jonas N. Becker
Title: ELECTRONIC STRUCTURE, SPIN PROPERTIES, AND CHARGE STATE STABILITY OF THE NEGATIVELY CHARGED NICKEL VACANCY CENTER IN DIAMOND
Advisor: Jonas Becker
Research Category: MATERIALS, MECHANICS AND ADVANCED MANUFACTURING
Keywords: DIAMOND, QUBIT, COLOR CENTER

Poster Number: S2-D43
Authors: Chad Moorman; Balasubramaniam Shanker
Title: WELL CONDITIONED FINITE ELEMENT BOUNDARY INTEGRAL FORMULATIONS.
Advisor: Shanker Balasubramaniam
Research Category: COMPUTATIONAL AND INFORMATIONAL SYSTEMS
Keywords: FINITE ELEMENT, BOUNDARY INTEGRAL, COMPUTATIONAL ELECTROMAGNETICS

Poster Number: S2-D44
Authors: Yu Mei; Preston Fairchild; Vaibhav Srivastava; Changyong Cao; Xiaobo Tan
Title: SIMULTANEOUS MOTION AND STIFFNESS CONTROL FOR SOFT PNEUMATIC MANIPULATORS BASED ON A LAGRANGIAN-BASED DYNAMIC MODEL
Advisor: Xiaobo Tan
Research Category: MOBILITY AND ROBOTICS
Keywords: SOFT MANIPULATORS, STIFFNESS CONTROL, TRAJECTORY TRACKING
Poster Number: S2-D45
Authors: R. Chauncey Splichal; Christina Chan; S. Patrick Walton
Title: ENDOPLOPLASMIC RETICULUM (ER) STRESS ALTERS siRNA-MEDIATED SILENCING VIA CHOLESTEROL DYSREGULATION
Advisor: S. Patrick Walton
Research Category: HEALTH AND BIOMEDICAL
Keywords: DRUG DELIVERY, siRNA

Poster Number: S2-D46
Authors: Alex Loomis; Logan Crooks; Jonas Becker; Shannon Nicley
Title: CHEMICAL VAPOR DEPOSITION OF SILICON VACANCY ENSEMBLES IN DIAMOND
Advisor: Shannon Nicley
Research Category: MATERIALS, MECHANICS AND ADVANCED MANUFACTURING
Keywords: CHEMICAL VAPOR DEPOSITION, SILICON VACANCY, QUANTUM MEMORIES

Poster Number: S2-D47
Authors: Patricia Guillante; Kristen Cetin
Title: IMPROVING THE PARTICIPATION OF DIVERSE RESIDENTIAL BUILDINGS IN DEMAND-side MANAGEMENT
Advisor: Kristen Cetin
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: DEMAND-SIDE MANAGEMENT, OCCUPANCY, RESIDENTIAL BUILDINGS
This work is supported by the National Science Foundation.

Poster Number: S2-D48
Authors: Alesa Netzley; Lauren Kleyn; Kirk Munoz; Jane Manfredi; Jie Huang; Galit Pelled
Title: THE EFFECTS OF CONCUSSION ON BRAIN FUNCTION AND CONNECTIVITY IN YUCATAN MINIPIGS
Advisor: Galit Pelled
Research Category: HEALTH AND BIOMEDICAL
Keywords: TRAUMATIC BRAIN INJURY, MAGNETIC RESONANCE IMAGING, PIG
This work is supported by the National Institutes of Health.

Poster Number: S2-D49
Authors: Gagan Gupta; Peter Savolainen
Title: DO DISTRACTIONS AFFECT THE OCCURRENCE OF SAFETY-CRITICAL EVENTS: A COMPARISON OF TRENDS AT INTERSECTIONS USING NATURALISTIC DRIVING DATA
Advisor: Peter Savolainen
Research Category: SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER
Keywords: NATURALISTIC DRIVING STUDY, DRIVER DISTRACTION, SAFETY-critical EVENTS
**Poster Number:** S2-D50  
**Authors:** Kunle Adeyemo; Annick Anctil  
**Title:** ESTIMATING THE ECONOMIC BENEFITS OF USING SECOND LIFE BATTERIES IN DIRECT CURRENT FAST CHARGING STATIONS  
**Advisor:** Annick Anctil  
**Research Category:** SUSTAINABILITY: INFRASTRUCTURE, ENVIRONMENT, ENERGY AND WATER  
**Keywords:** ENERGY STORAGE SYSTEM, FAST CHARGING, BATTERIES.

**Poster Number:** S2-D51  
**Authors:** Morgan Sandler; Arun Ross  
**Title:** AUTOMATIC SPEAKER RECOGNITION IN EMOTIVE SETTINGS  
**Advisor:** Arun Ross  
**Research Category:** COMPUTATIONAL AND INFORMATIONAL SYSTEMS  
**Keywords:** AUTOMATIC SPEAKER RECOGNITION, EMOTION, BIOMETRICS  
This work is supported by the National Association of Broadcasters.