Iowa State University

13th SYMPOSIUM ON UNDERGRADUATE RESEARCH & CREATIVE EXPRESSION

April 17, 2019

http://www.undergradresearch.iastate.edu/symposium/
Program Overview

8:00 – 9:00 REGISTRATION AND BREAKFAST, Memorial Union, Pioneer Room

9:00 – 9:20 OPENING, Memorial Union, Gallery Room

Welcome: Dr. Svitlana Zbarska, Undergraduate Research Program Coordinator

Opening remarks: Dr. Guru Rao, Associate Vice President for Research

9:30 – 10:45 SESSION I (concurrent presentations)

I.A – Animal Science
  Memorial Union, Gallery Room
I.B – Political Science and Spanish
  Memorial Union, Room 3534
I.C – History and Economics
  Memorial Union, Room 3558
I.D – Computer and Software Engineering
  Memorial Union, Room 3505
I.E – Architecture
  Memorial Union, Oak Room
I.F – Biochemistry
  Memorial Union, Cardinal Room
I.G – Microbiology & Genetics
  Memorial Union, Room 3512

10:45 – 11:00 Break & Refreshments, Memorial Union, Pioneer Room

11:00 – 12:00 SESSION II (concurrent presentations)

II.A – Biosystems Engineering
  Memorial Union, Cardinal Room
II.B – Physics
  Memorial Union, Room 3505
II.C – Sociology
  Memorial Union, Gallery Room
II.D – Community and Regional Planning
  Memorial Union, Room 3512
II.E – Entomology
  Memorial Union, Room 3558
II.F – Kinesiology and Health
  Memorial Union, Oak Room
II.G – Environmental Studies
  Memorial Union, Room 3534
II.H – Psychology and Mass Communication
  Memorial Union, Gold Room
12:00 – 1:00  Lunch, Memorial Union, Sun Room

Key speaker presentation: “Life Lessons From a Circuitous Career”, Dr. James Oliver, Director of the ISU Student Innovation Center, professor at the Department of Mechanical Engineering, Iowa State University

1:00 – 2:15  SESSION III (concurrent presentations)

III.A – Materials Engineering
   Memorial Union, Room 3534
III.B – Mechanical Engineering
   Memorial Union, Oak Room
III.C – Psychology
   Memorial Union, Cardinal Room
III.D – Electrical Engineering
   Memorial Union, Room 3505
III.E – Civil Engineering
   Memorial Union, Room 3558
III.F – Kinesiology and Health
   Memorial Union, Room 3512
III.G – Microbiology
   Memorial Union, Gold Room
III.H – Environmental Science
   Memorial Union, Gallery Room

2:15 – 2:30  Break & Refreshments, Memorial Union, Pioneer Room

2:30 – 3:30  SESSION IV (concurrent presentations)

IV.A – Chemistry
   Memorial Union, Cardinal Room
IV.B – Aerospace and Mechanical Engineering
   Memorial Union, Gallery Room
IV.C – Food Science and Human Nutrition
   Memorial Union, Oak Room
IV.D – Genetics and Microbiology
   Memorial Union, Room 3512
IV.E – Agronomy and Environmental Science
   Memorial Union, Room 3558
IV.F – Political Science and Mass Communication
   Memorial Union, Gold Room
IV.G – Biology and Animal Ecology
   Memorial Union, Room 3534
IV.H – Industrial Engineering and Design
   Memorial Union, Room 3505

3:00 – 5:00  POSTER SESSION, Memorial Union, Great Hall

Each presentation is allotted 15 minutes. Participants and guests are asked to not enter or leave the rooms during presentations.
A Message from the Undergraduate Research Program

Welcome to the Iowa State University’s 13th Annual Symposium on Undergraduate Research & Creative Expression. The Symposium provides undergraduates from all academic disciplines with an opportunity to share their research with the university community and other quests through oral and poster presentations. Near 190 students from all Iowa State University colleges will present about 130 research projects. More than 50 Iowa State faculty members will participate as faculty moderators to provide feedback to presenters. More than 80 student volunteers from the University Honors Program will assist in running the symposium. The Symposium represents part of a large effort of Iowa State University to enhance, support and celebrate undergraduate research activity.

The students selected for this year’s Symposium and their mentors represent all the Colleges at Iowa State University: Agricultural & Life Sciences, Business, Design, Engineering, Human Sciences, Liberal Arts & Sciences and, Graduate and Veterinary Medicine.

We hope you enjoy the day!

Svitlana Zbarska
Symposium Coordinator
ISU Undergraduate Research program coordinator campus-wide
SESSION I, 9:30 – 10:45 am

ANIMAL SCIENCE

Faculty Moderator: Joshua Selsby, Animal Science

I.A.1 Effect Of Two Dietary Copper Treatments On Implant Performance Response And Carcass Characteristics Of Finishing Beef Steers
Presenter: Summer Castillo, Animal Science
Mentor: Stephanie Hansen, Animal Science

I.A.2 In Situ Fiber Digestibility of Soybean Meal and DDGS Pelleted with Corn Stover Compared to Pelleted Corn Gluten Feed for Dairy Cows
Presenter: Miranda Clausen, Animal Science
Mentor: Hugo Ramirez-Ramirez, Dairy Nutrition

I.A.3 The Effects of Dietary Protein Oxidation on Growing Pigs
Presenter: Erika Johnson, Animal Science
Mentor: Mariana Rossoni-Serao, Animal Science

POLITICAL SCIENCE

Faculty Moderator: Mack Shelley, Political Science

I.B.1 Blackness in Latin America: Current Racial Discourse and the Role of the Census
Presenter: Nayely Hurtado, Political Science, Spanish
Mentor: Elisa Rizo, World Languages & Cultures

I.B.2 Tracking Second Language Phonetic Learning in Spontaneous Speech
Presenter: Shelby Bruun, Spanish and International Studies
Mentor: Charles Nagle, World Languages and Cultures

HISTORY AND ECONOMICS

Faculty Moderator: Diane Janvrin, Accounting

I.C.1 Measuring Farm Size in the United States, 1959-2012
Presenter: Skyler Schneekloth, Economics and History
Mentor: Peter Orazem, Economics

I.C.2 Carrie Chapman Catt: Contextualizing Controversy
Presenter: Crystal Brandenburgh, History
Mentor: Stacy Cordery, History

I.C.3 Erwin Panofsky’s Iconography in the Interpretation of The Sixth Patriarch Chopping Bamboo
Presenter: Jiu Cao, Visual Culture Study
Mentor: John Cunnally, Visual Culture Study
### COMPUTER AND SOFTWARE ENGINEERING

**Faculty Moderator:** Aleksandar Dogandzic, Electrical Engineering and Computer Science

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<tr>
<th>Session</th>
<th>Title</th>
<th>Presenter</th>
<th>Mentor</th>
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<tbody>
<tr>
<td>I.D.1</td>
<td>Investigating and Modeling a Network of Embedded Systems</td>
<td>Modeste Kenne, Computer Engineering</td>
<td>Phillip Jones, Electrical and Computer Engineering</td>
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<tr>
<td>I.D.2</td>
<td>Let The Device Talk</td>
<td>Yealim Sung, Software Engineering</td>
<td>Mai Zheng, Electrical and computer Engineering</td>
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### ARCHITECTURE

**Faculty Moderator:** Andrea Wheeler, Architecture

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<tbody>
<tr>
<td>I.E.1</td>
<td>Creating E-Footprints: A Case Study In Creating Virtual Space For Environmental Learning</td>
<td>Evan Harrison, Architecture</td>
<td>Alenka Poplin, Community and Regional Planning</td>
</tr>
<tr>
<td>I.E.2</td>
<td>Entertainment Spaces 2.0</td>
<td>Shivang Patel, Architecture</td>
<td>Lynn Paxson, Architecture</td>
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### BIOCHEMISTRY

**Faculty Moderator:** Stone Chen, Biochemistry

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<tbody>
<tr>
<td>I.F.1</td>
<td>Determinants of Membrane Association in the Synaptic GTPase-Activating Protein SynGAP</td>
<td>Sarah Zelle, Biochemistry and Genetics</td>
<td>Eric Underbakke, Biochemistry</td>
</tr>
<tr>
<td>I.F.2</td>
<td>Understanding the Binding Affinity of Neutrophil Gelatinase-Associated Lipocalin with DNA Aptamer</td>
<td>Sam Coder, Biochemistry</td>
<td>Marit Nilsen-Hamilton, Biochemistry, Biophysics and Molecular Biology</td>
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<tr>
<td>I.F.3</td>
<td>Response of different length of LCN2 promoter to LPS.</td>
<td>Hiroki Hasebe, Biochemistry</td>
<td>Marit Nilsen-Hamilton, Biochemistry, Biophysics and Molecular Biology</td>
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### MICROBIOLOGY AND GENETICS

**Faculty Moderator:** Aubrey Mendonca, Food Science and Human Nutrition

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<tr>
<td>9:30</td>
<td>I.G.1</td>
<td>3512</td>
<td>Autophagy Importance in Podocyte Homeostasis in Drosophila</td>
<td>Rachel Mehmert, Biology</td>
<td>Hua Bai, Genetics Development and Cell Biology</td>
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<tr>
<td>9:45</td>
<td>I.G.2</td>
<td>3512</td>
<td>Analysis of the P97 and P102 Gene Families in Mycoplasma Hyopneumoniae Isolates</td>
<td>Morgan Smith, Software Engineering and Microbiology</td>
<td>Iddo Friedberg, Chris Minion, Veterinary Microbiology and Preventive Medicine</td>
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<tr>
<td>10:00</td>
<td>I.G.3</td>
<td>3512</td>
<td>Examining The Functional Role Of Micrornas Implicated In Hypermobility Ehlers-Danlos Syndrome In Maintaining Connective Tissue Morphology</td>
<td>Scarlett Eagle, Genetics</td>
<td>Elizabeth McNeill, Food Science and Human Nutrition</td>
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### SESSION II, 11:00 am – 12:00 pm

**BIOSYSTEMS ENGINEERING**

**Faculty Moderator:** Jacek Koziel, Agricultural and Biosystems Engineering

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<tr>
<td>11:00</td>
<td>II.A.1</td>
<td>3505</td>
<td>Effects of Hydraulic Residence Time on Water Quality in Woodchip Bioreactors</td>
<td>Kyle Werning, Biosystems Engineering</td>
<td>Michelle Soupir, Agricultural and Biosystems Engineering</td>
</tr>
<tr>
<td>11:30</td>
<td>II.A.3</td>
<td>3505</td>
<td>UV Light Treatment of Barn Inlet Air to Mitigate PRRS Transmission</td>
<td>Peiyang Li, Biosystems Engineering and Environmental Science</td>
<td>Jacek Koziel, Agricultural and Biosystems Engineering</td>
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<tr>
<td>11:00</td>
<td>II.B.1</td>
<td>3505</td>
<td>Exploring New Source Classification Methods in Infrared Astronomy with Machine Learning</td>
<td>Jacqueline Blaum, Physics and Computer Science</td>
<td>Rafael Martinez-Galarza, Smithsonian Astrophysical Observatory, Harvard-Smithsonian Center for Astrophysics</td>
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<tr>
<td>11:15</td>
<td>II.B.2</td>
<td>3505</td>
<td>Particle Hole Symmetry Breaking in Cuprate Superconductors</td>
<td>Daniel Russell, Physics</td>
<td>Adam Kaminski, Physics</td>
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### Session II.C
**11:00 – 12:00**  
**Gallery Room**  
**Faculty Moderator:** Sree Nilakanta, Supply Chain and Information Systems

| **II.C.1** | Law And Policies Regarding Stepfamily Relationships: A Patchwork Quilt  
**Presenter:** Elcy Timothy, Sociology and Political Science  
**Mentor:** Susan Stewart, Sociology |
| **II.C.2** | An In-Progress Look at the State of Sexual Violence Knowledge on Iowa State’s Campus  
**Presenter:** Emily Hammer, Marketing and Management  
**Mentor:** Alissa Stoehr, Sociology |
| **II.C.3** | Utilizing the Push-Pull Theory to Explore Green Event Attendees’ Motivations  
**Presenter:** Yu Ye, Event Management  
**Mentor:** Ching-Hui Su, Apparel, Events, and Hospitality Management |
| **II.C.4** | Predicting Shifts In Iowa Farmers’ Climate Change Beliefs And Attitudes Toward Climate Action Over Time  
**Presenter:** Sara Ronnkvist, Statistics  
**Mentor:** J. Gordon Arbuckle, Jr, Sociology |

### Session II.D
**11:00 – 12:00**  
**Cardinal Room**  
**Faculty Moderator:** Ted Grevstad-Nordbrock, Community and Regional Planning

| **II.D.1** | The Case for Car-Free Communities  
**Presenters:** Zoey Mauck, Landscape Architecture and Community and Regional Planning  
**Mentor:** Ben Shirtcliff, Design |
| **II.D.2** | Examination of Economic Resilience and Regional Capacity in the Midwest  
**Presenter:** Stuart Burzette, Community and Regional Planning and Environmental Science  
**Mentor:** Monica Haddad, Community and Regional Planning |

### Session II.E
**11:00 – 12:00**  
**Room 3558**  
**Faculty Moderator:** Sue Blodgett, Entomology

| **II.E.1** | Stress Related Protein Expression in Honeybees  
**Presenter:** Roslyn Gray, Biology and Women’s and Gender Studies  
**Mentor:** Amy Toth, Ecology, Evolution, and Organismal Biology |
| **II.E.2** | Mirror-Induced Behavior in Paper-Wasps: Is an Insect Capable of Self-Recognition?  
**Presenter:** Jessica Riojas, Environmental Science and Biology  
**Mentor:** Amy Toth, Ecology, Evolution, and Organismal Biology |
Session II.F
11:00 – 12:00
Oak Room

KINESIOLOGY AND HEALTH

Faculty Moderator: Elizabeth Stegemoller, Kinesiology

II.F.1 Cardiovascular Function and Stress in Parkinson's Disease
Presenters: Rebekah Trost, Kinesiology and Health, Cailie Logue, Kinesiology and Health
Mentor: Elizabeth Stegemoller, Kinesiology

II.F.2 Changes in Cognitive Processing, Working Memory, and Anhedonia in Response to Exercise in Individuals with Major Depressive Disorder
Presenter: Jenna King, Kinesiology and Health
Mentor: Jacob Meyer, Kinesiology

II.F.3 Associations of Cardiorespiratory Fitness and Muscular Strength with Mental Cognition in Older Adults
Presenter: Tilak Patel, Kinesiology
Mentor: Angelique Brellenthin, Kinesiology

II.F.4 Effect of Music and Exercise on Motor Function in People with Parkinson's Disease
Presenters: Mikayla Weron, Kinesiology and Health, Claire Bridges, Kinesiology and Health
Mentor: Elizabeth Stegemoller, Kinesiology

Session II.G
11:00 – 12:00
Room 3534

ENVIRONMENTAL SCIENCE

Faculty Moderator: Rachel Eike Apparel, Events and Hospitality Management

II.G.1 Capturing Iowa Lakeside Lab's Dark Data
Presenter: Sydney Weldon, Biology
Mentor: Lori Biederman, Ecology, Evolution and Organismal Biology

II.G.2 Balancing Conservation And Economics To Improve Water Quality In Iowa And Beyond
Presenter: Lucas Goodman, Animal Ecology and Environmental Studies
Mentor: Thomas Isenhart, Natural Resource Ecology and Management

Session II.H
11:00 – 12:00
Gold Room

PSYCHOLOGY AND MASS COMMUNICATION

Faculty Moderator: Christina Svec, Music and Theatre

II.H.1 Assessing Empathy in Persuasive Health, Environment and Risk Communication
Presenters: Emily Haberlack, Environmental Science, Environmental Studies, and Sociology
Mentor: Dara Wald, Greenlee School of Journalism and Communication

II.H.2 Exploring Relations Between Dark Personality Traits, Media Violence Exposure, and Finding Humor in Media Violence
Presenter: Sabrina Ash, Psychology
Mentor: Craig Anderson, Psychology
SESSION III, 1:00 pm – 2:15 pm

MATERIALS ENGINEERING

Faculty Moderator: Svitlana Zbarska, Undergraduate Research program coordinator

III.A.1 Development of Copper Based Elastocaloric Materials
Presenter: Emery Farmer, Material Science and Engineering
Mentor: Jun Cui, Material Science and Engineering

III.A.2 Optimization of Mixed Glass Former/Mixed Anion Glassy Electrolytes through the Utilization of Planetary Ball Milling
Presenter: Onel Valdez, Materials Science Engineering
Mentor: Steven Kmiec, Materials Science Engineering

III.A.3 A Study of Kinetic Fragility Along the Na4P2S7-xOx Glass Series
Presenter: Jacob Lovi, Materials Engineering
Mentor: Steve Martin, Materials Science and Engineering

III.A.4 Fueling Space Exploration: Engineering Materials to Produce Rocket Fuel on Mars
Presenter: Brandon Vance, Chemical Engineering
Mentor: Jean-Philippe Tessonnier, Chemical and Biological Engineering

MECHANICAL ENGINEERING

Faculty Moderator: James Michael, Mechanical Engineering

III.B.1 Creating Repeatable Shock Wave Pressures Using a Customized Scoring Device for Diaphragms
Presenter: Megan Beck, Mechanical Engineering
Mentor: Sarah Bentil, Mechanical Engineering

III.B.2 Parametric Modeling and Design of Tricuspid Heart Valves
Presenter: Caroline Crisp, Mechanical Engineering
Mentor: Ming-Chen Hsu, Mechanical Engineering

PSYCHOLOGY

Faculty Moderator: Susan Yager, English

III.C.1 Do Jurors Need Less Evidence To Convict Minority Defendants?
Presenter: Natalie Teclaw, Psychology, Criminal Justice, and Sociology
Mentor: Kristen Slapinski, Psychology

III.C.2 Exploring Relations Between Dark Personality Traits, Media Violence Exposure, and Finding Humor in Media Violence
Presenter: Sabrina Ash, Psychology
Mentor: Craig Anderson, Psychology
III.C.3 Abriendo Caminos: Promoting Healthy Family Mealtime Routines and Climate Among Mexican Immigrant Families
**Presenter:** Alondra Sanchez-Laguna, Bachelor of Liberal Studies
**Mentor:** Kimberly Greder, Human Development and Family Studies

### ELECTRICAL ENGINEERING

**Session III.D**
**1:00 – 2:15**
**Room 3505**

**Faculty Moderator:** Ratnesh Kumar, Electrical and Computer Engineering

**III.D.1** Comparison between FlexiForce Sensors and a Low-cost Capacitive Force Sensor Exposed to a Shock Wave
**Presenter:** Marcelo Christhiam Gomes Abrantes, Electrical Engineering
**Mentor:** Sarah Bentil, Mechanical Engineering

### CIVIL ENGINEERING

**Session III.E**
**1:00 – 2:15**
**Room 3558**

**Faculty Moderator:** Claus Kadelka, Mathematics

**III.E.1** TIMELI: Using Data Analysis to Improve Traffic Safety
**Presenter:** Philip Cordova, Computer Science
**Mentor:** Anuj Sharma, Civil, Construction, and Environmental Engineering

**III.E.2** Pavement Thermodynamics at Great Mosque of Makkah, Saudi Arabia
**Presenter:** Shatha Alghamdy, Civil Engineering
**Mentor:** James Alleman, Civil, Construction and Environmental Engineering

**III.E.3** Optimizing Maintenance Equipment Life Cycle for Local Agencies
**Presenter:** Caria Collins, Civil Engineering
**Mentor:** Jennifer Shane, Civil Engineering

### KINESIOLOGY AND HEALTH

**Session III.F**
**1:00 – 2:15**
**Room 3512**

**Faculty Moderator:** Rudy Valentine, Kinesiology

**III.F.1** Peer Health Coaching for Physical Activity, Self-Efficacy, and Stress in College Students
**Presenter:** Kylee Joiner, Kinesiology and Health and Global Resource Systems
**Mentor:** Gregory Welk, Kinesiology

**III.F.2** The Effects of Boxing Therapy on Upper Extremity Muscle Activity in Persons with Parkinson's Disease
**Presenters:** Thomas Berta, Kinesiology, Matthew Turk, Kinesiology
**Mentor:** Elizabeth Stegemoller, Kinesiology
Session III.G 1:00 – 2:15  
Gold Room

**MICROBIOLOGY**

Faculty Moderator: Mark Rasmussen, Microbiology

**III.G.1**  Effect Of Repeated Low-Level Hydrogen Sulfide Exposure On Pathogenicity Of Influenza- A Virus In Pigs  
Presenter: Amber Vegter, Biology and Animal Science  
Mentor: Wilson Rumbeiha, Veterinary Diagnostic and Production Animal Medicine

**III.G.2**  Synthesis of a mRNA vs protein vaccine: a possible treatment to prevent human parainfluenza virus in children  
Presenter: Natalie Lohmann, Biology  
Mentor: David Verhoeven, Veterinary Microbiology and Preventive Medicine

**III.G.3**  Assessing The Growth Of Fusarium Virguliforme On Culture Media Amended With Crop Residues  
Presenter: Cristian Olmos, Microbiology  
Mentor: Leonor Leandro, Plant Pathology and Microbiology

Session III.H 1:00 – 2:15  
Gallery Room

**ENVIRONMENTAL SCIENCE**

Faculty Moderator: Laura Merrick, Agronomy

**III.H.1**  Late Quaternary Fire and Hydroclimate at the Southern Limit of the North American Temperate Tallgrass Prairie.  
Presenter: Jacqueline Galang, Environmental Science  
Mentor: Hannah Carroll, Ecology, Evolution and Organismal Biology

**III.H.2**  Application Of Heat-Flow Modeling To Estimate Hydraulic Conductivity In The Ames Aquifer  
Presenter: Thomas Doyle, Environmental Science  
Mentor: William Simpkins, Geological And Atmospheric Sciences

**III.H.3**  The Impacts of Diverting Water by Hand-Dug Channels in the Nile Watershed on Agriculture, Food Security, and Water Management in the Kamuli District of Uganda  
Presenter: Hannah Baysinger, Global Resource Systems, Environmental Studies, Spanish  
Mentor: Emily Zimmerman, Horticulture

**III.H.4**  Tracking e. Coli and Phosphorus Pollution in an Urban-Rural Watershed  
Presenter: Colin Welk, Environmental Science  
Mentor: Laura Merrick, Agronomy

Session IV.A 2:30 – 3:30  
Cardinal Room

**SESSION IV, 2:30 pm – 3:30 pm**

**CHEMISTRY**

Faculty Moderator: Joshua Peschel, Agricultural and Biosystems Engineering

**IV.A.1**  Structure and Synthesis of Rare Earth Tetrel Pnictides  
Presenter: Brennan McBride, Chemistry  
Mentor: Kirill Kovnir, Chemistry
IV.A.2 Synthesis And Crystal Structure Of Novel AuGeP Compound  
Presenter: Juyeon Won, Chemistry  
Mentor: Shannon Lee, Chemistry

IV.A.3 Use of Image Quality Scores to Determine Fingerprint Age in MALDI Imaging  
Presenter: Madison Thomas, Chemistry  
Mentor: Young-Jin Lee, Chemistry

IV.A.4 Ion Concentration Polarization In A Simple Paper Device For Tear Analysis  
Presenter: Dorian Twedt, Chemistry  
Mentor: Robbyn Anand, Chemistry

Session IV.B  
2:30 – 3:30  
Gallery Room

AEROSPACE AND MECHANICAL ENGINEERING

Faculty Moderator: Bella Kim, Aerospace Engineering

IV.B.1 Runtime Verification Benchmark Generation for MLTL Properties via SAT and SMT  
Presenter: Josh Wallin, Computer Engineering and Spanish  
Mentor: Kristin Rozier, Aerospace Engineering

IV.B.2 Investigating Earth’s Magnetic Field with a CubeSat Fleet  
Presenter: Alex Scott, Aerospace Engineering  
Mentor: Ossama Abdelkhalik, Aerospace Engineering

IV.B.3 Autonomous Entry, Descent, and Landing (EDL) Guidance Strategies for a Human Mission to Mars  
Presenter: Richard Hoobler, Aerospace Engineering  
Mentor: Dae Young Lee, Aerospace Engineering

IV.B.4 Gas-Turbine Performance Optimization Utilizing Surrogate Management Framework And Fluid-Structure Interaction  
Presenter: Nikita Kozak, Mechanical Engineering  
Mentor: Ming-Chen Hsu, Mechanical Engineering

Session IV.C  
2:30 – 3:30  
Oak Room

FOOD SCIENCE AND HUMAN NUTRITION

Faculty Moderator: Don Beitz, Biochemistry, Biophysics and Molecular Biology/Animal Sciences

IV.C.1 The Impact Of Compulsive Ethanol Consumption On Gut And Brain Neurochemicals  
Presenter: Allyse Shoeman, Nutritional Science  
Mentor: Peter Clark, Food Science and Human Nutrition

IV.C.2 Nutritional Outcomes of Mothers and Children in a Community-Based Malnutrition Management Program  
Presenter: Nyahon Both, Dietetics  
Mentor: Dorothy Masinde, Horticulture

IV.C.3 Defining Dairy Consumption in Pregnant Women Living in Central Iowa  
Presenter: Jessica Lundberg, Dietetics  
Mentor: Christina Campbell, Food Science and Human Nutrition
## GENETICS AND MICROBIOLOGY

**Session IV.D**  
2:30 – 3:30  
Room 3512  

**Faculty Moderator:** Donald Sakaguchi, Genetics, Development and Cell Biology  

**IV.D.1** Optimizing CRISPR interference for Conditional Gene Regulation in Malaria Parasites  
**Presenter:** Ellen Meis, Biology and Environmental Science  
**Mentor:** Josh Beck, Biomedical Sciences  

**IV.D.2** Recovery of Adult Neural Progenitor Cells from Alginate Hydrogels  
**Presenter:** Laura Pesquera Colom, Biology  
**Mentor:** Donald Sakaguchi, Genetics, Development and Cell Biology  

**IV.D.3** Investigation Of Cell-Seeded Gelatin Scaffolds As A Novel Cell Transplantation Strategy Using Zebrafish As A Model System  
**Presenter:** Marissa Roghair, Genetics, Microbiology  
**Mentor:** Donald Sakaguchi, Genetics, Development and Cell Biology  

**IV.D.4** Assessment Of Neural Stem Cell Proliferation And Migration For Regeneration Therapies  
**Presenter:** Amy Stark, Genetics  
**Mentor:** Donald Sakaguchi, Genetics, Development and Cell Biology

## AGRONOMY AND ENVIRONMENTAL SCIENCE

**Session IV.E**  
2:30 – 3:30  
Room 3558  

**Faculty Moderator:** Brian Hornbuckle, Agronomy  

**IV.E.1** Are Yield Increases In Fertilized Biomass Crops Worth Reductions In Water Quality?  
**Presenter:** Tyler Donovan, Agronomy  
**Mentor:** Emily Heaton, Agronomy  

**IV.E.2** Investigation of Discrepancies between Methods of Quantifying Soil Nitrogen in Agricultural Fields  
**Presenter:** Christina Meadows, Environmental Science and Geology  
**Mentor:** Michael Castellano, Agronomy  

**IV.E.3** Determining When Tillage or Crop Effects are Dominant to Make Satellite Soil Moisture Work in Iowa  
**Presenter:** Luke Sloterdyk, Global Resource Systems and Environmental Science  
**Mentor:** Brian Hornbuckle, Agronomy

## POLITICAL SCIENCE AND MASS COMMUNICATION

**Session IV.F**  
2:30 – 3:30  
Gold Room  

**Faculty Moderator:** Svitlana Zbarska, Undergraduate Research program coordinator  

**IV.F.1** #BlackBoyJoy: Visual Framing on Twitter  
**Presenter:** Julian Neely, Journalism and Mass Communication  
**Mentor:** Daniella Dimitrova, Greenlee School of Journalism  

**IV.F.** Examining and Analyzing Institutional Discourse on Twitter: Engaging Prospective Students  
**Presenter:** Nayelie Valenzuela, Public Relations  
**Mentor:** Daniela Dimitrova, Greenlee School of Journalism and Communication
Session IV.G
2:30 – 3:30
Room 3534

BIOLOGY AND ANIMAL ECOLOGY

Faculty Moderator: Jodi McGill, Veterinary Microbiology and Preventive Medicine

IV.G.1 Evaluating The Efficacy Of Autonomous Recording Units For Fall Northern Bobwhite Surveys
Presenter: Kyla Yuza-Pate, Animal Ecology
Mentor: Adam Janke, Natural Resource Ecology and Management

IV.G.2 Understanding Interactions Between Avian Seed Dispersers and Landscapes: A Case Study of Guam.
Presenter: Ethan Rose, Biology and Animal Ecology
Mentor: Hugo Thierry, Ecology, Evolution and Organismal Biology

IV.G.3 Epigenetic Effects of Environmental Contaminants on Turtles with Temperature-Dependent Sex Determination
Presenter: Victoria Villanueva, Biology
Mentor: Fredric Janzen, Ecology, Evolution and Organismal Biology

Session IV.H
2:30 – 3:30
Room 3505

INDUSTRIAL ENGINEERING AND DESIGN

Faculty Moderator: Azadeh Sheidaei, Aerospace Engineering

IV.H.1 Analyzing Power Tools with an Ergonomic Perspective
Presenter: Christopher Hernandez, Industrial Engineering
Mentor: Richard Stone, Industrial and Manufacturing Systems Engineering

IV.H.2 Empathy in Design: How does diversity of personas affect creativity?
Presenter: Eric Diaz, Mechanical Engineering
Mentor: Tejas Dhadphale, Industrial Design

POSTER SESSION, 3:00 pm – 5:00 pm

POSTER SESSION

Poster Session
3:00-5:00
Great Hall

P.1 Gait and Music EMG
Presenters: Callan Barrick, Kinesiology, Teagan Manus, Kinesiology, Marissa Koepp, Kinesiology
Mentor: Elizabeth Stegemoller, Kinesiology

P.2 Analysis of Iowa Public Universities’ Financials’ Impact on Tuition Prices from 1990-2018
Presenters: Brandon Beecham, Biology
Mentor: Diane Janvrin, Accounting

P.3 Comparison of Cytokine Expression in Healthy Older Adults and People with PD
Presenters: Alaina Berg, Biology, Chirayu Shukla, Biology
Mentor: Elizabeth Stegemoller, Kinesiology

P.4 Exploring Wearable Technology: Prototyping of Solar Powered Book Bags
Presenter: Courtney Beringer, Mechanical Engineering
Mentor: Eulanda Sanders, Apparel, Events and Hospitality Management
The Effects of Boxing Therapy on Upper Extremity Muscle Activity in Persons with Parkinson’s Disease  
**Presenter:** Thomas Berta, Kinesiology, Matthew Turk, Kinesiology  
**Mentor:** Elizabeth Stegemoller, Kinesiology

Helping Health Care Professionals Understand Social Support Communication Needs for Parents of Children Living With Complex Chronic Conditions  
**Presenters:** Sydney Ellis, Spanish and Psychology, Nicole Miller, Communication Studies  
**Mentor:** Katherine Rafferty, Psychology

A Climatology of Near-Storm Parameters for Nine Types of Tornado-Producing Thunderstorms  
**Presenter:** Nathan Erickson, Meteorology  
**Mentor:** William Gallus, Meteorology

Co-creating Sketchnote Visuals with Honors Students  
**Presenters:** Haley Grote, Industrial Design, Pre-Design, Mary Murphy, Industrial Design, Brandon Edwards, Pre-Architecture, Carolyn Driskell, Pre-Graphic Design, Annaka Ketterer, Pre-Industrial Design  
**Mentor:** Verena Paepcke-Hjeltness, Industrial Design

Damage, Dislocation, and Displacement of Renter and Immigrant Households after Low Attention Disasters  
**Presenters:** Ruben Hernandez, Community and Regional Planning, Emily Vanek, Community and Regional Planning, Jasmine Khammany, Community and Regional Planning  
**Mentor:** Sara Hamideh, Community and Regional Planning

Treatment to Reduce Potentially-Virulent Escherichia coli in the Gut and Prevent Avian Colibacillosis  
**Presenters:** Ryley Hoven, Biology and French, Mary Kate Horak, Dietetics  
**Mentor:** Melha Mellata, Food Science and Human Nutrition

Evaluating Criminal Punishments  
**Presenters:** Lauren Hudachek, Psychology, Criminal Justice and Anthropology, Erin Izer, Psychology  
**Mentor:** Gary Wells, Psychology

The Role of Trust and Credibility in Public Understanding of Science and Attitudes Toward Scientists  
**Presenters:** Madelyn Huinker, Communication Studies and Environmental Studies, Katlyn Campbell, Journalism and Mass Communication  
**Mentor:** Dara Wald, Journalism and Mass Communication

Continuous Remote Attestation for Ultra-Low Power Processors  
**Presenters:** Shane Impola, Computer Engineering, Bradley Rhein, Computer Engineering, Dennis Xu, Computer Engineering  
**Mentor:** Henry Duwe, Electrical and Computer Engineering

On the Construction of a Gene Regulatory Network Database for Meta-Analyses in Boolean Canalizing Functions  
**Presenters:** Jack Kinseth, Mathematics, Haris Serdarevic, Mathematics  
**Mentor:** Claus Kadelka, Mathematics

Lean Gestational Diabetes Mellitus Impacts Ovarian Gap Junction Protein Expression  
**Presenter:** Avery Korns, Animal Science and Animal Ecology  
**Mentor:** Aileen Keating, Animal Science
P.16 Manganese mineral pathways in aquatic settings and their use in determining conditions of an ancient lake on mars.  
**Presenter:** Gabrielle Ledesma, Geology  
**Mentor:** Elizabeth Swanner, Geologic and Atmospheric Sciences

P.17 The Importance Of Creating Academic And Professional Environments For Multicultural Students In Agriculture  
**Presenter:** Adamarie Marquez Acevedo, Animal Science  
**Mentor:** Elizabeth Martinez Podolsky, Animal Science

P.18 IL-17 Contributes To Disease During Mild Brsv Infection In The Neonatal Calf  
**Presenters:** Paiton McDonald, Agricultural Biochemistry, Madison Porter, Biology  
**Mentor:** Jodi McGill, Veterinary Medicine and Preventative Microbiology Research

P.19 A 3D Printed Airbrush Nozzle Attachment for Investigating Shape Changes of Soft Biological Tissue  
**Presenters:** Luke McPherson, Mechanical Engineering, Sarah Hansen, Mechanical Engineering  
**Mentor:** Sarah Bentil, Mechanical Engineering

P.20 The Acute and Post-Acute Effects of Concussion Education on the Perceptions and Reporting Intentions of At-Risk Athletes  
**Presenter:** Tessa Mendoza, Kinesiology and Health  
**Mentor:** Elizabeth Stegemoller, Kinesiology and Health

P.21 The Effects of Preferred Activating Music on Cognitive Inhibition  
**Presenters:** Allison Meyer, Molly Norman, Emma Gettes, Cortney Elkin, Ella Gustafson, Jonathan Mennecke, Kinesiology  
**Mentor:** Elizabeth Stegemoller, Kinesiology

P.22 What Matters More When Controlling Biologically-Available Carbon in Soil: Roots or Management?  
**Presenters:** Jack Pieper, Agronomy and Global Resource Systems  
**Mentor:** Andrew VanLoocke, Agronomy and Marshall McDaniel, Agronomy

P.23 Visual Animation of a Spacecraft Detumbling Control Algorithm with JavaScript WebGL  
**Presenters:** David Plotnik, Aerospace Engineering, Reed Kohlmeyer, Aerospace Engineering, Sebastian Johansen, Mechanical Engineering  
**Mentor:** Ossama Abdelkhalik, Aerospace Engineering

P.24 Developing a TRIZ-based Design for Flexibility Tool for Manufacturing Facilities  
**Presenters:** Shibani Raje, Industrial Engineering, Jenna Oftedal, Industrial Engineering  
**Mentor:** Leslie Potter, Industrial and Manufacturing Systems Engineering, Gul Kremer, Industrial and Manufacturing Systems Engineering

P.25 The Effects of Auditory Cues on Variability in Handwriting  
**Presenters:** Anna Reelfs, Jamie Halbert, Julia Hansen, Jamie Stuhr, Chloe Barton, Nikki Latimer, Ashley Miller, Gabrielle Woods, Andrew Zaman, Kinesiology  
**Mentor:** Elizabeth Stegemoller, Kinesiology

P.26 Behavioral Differences in Cognitive Inhibition of Aging Musicians and Non-Musicians  
**Presenter:** Kate Rumel, Kinesiology, Pre-Health  
**Mentor:** Elizabeth Stegemoller, Kinesiology
Sensor-based Measurement of Engagement to Inform Industrial Engineering Pedagogy: Preliminary Work
**Presenters:** Daniel Swegle, Jonah Scallon, Trevor Gould, Industrial and Manufacturing Systems Engineering
**Mentor:** Leslie Potter, Industrial and Manufacturing Systems Engineering

Mitigating Vibrations in Tall Buildings Under Extreme Wind Events
**Presenters:** Abigail Van Rheenen, Aerospace Engineering, Michael Huntley, Aerospace Engineering, Paul Iman, Mechanical Engineering
**Mentor:** Alice Alipour, Civil, Construction, and Environmental Engineering

An Experimental Design to Estimate the Number of Milkweed Plants Needed to Support Larval Monarch Butterfly Development
**Presenters:** Elke Windschitl, Animal Ecology and Biology, Carolyn White, Biological Systems Engineering and Global Resource Systems, Kayla Wernsing, Environmental Science and Geology
**Mentor:** Steven Bradbury, Entomology

The Relationship Between Finger and Toe Tapping in Persons with Parkinson’s Disease
**Presenters:** Ahmed Gamal Abdalla Zied, Kinesiology & Health, Cassandra Sardeson, Kinesiology
**Mentor:** Elizabeth Stegemoller, Kinesiology

Water Purification of Bacillus Subtilis Bacteria in Iowa State Water Sources Using Ceramic Filters
**Presenters:** Karen Devora, Bryce Trpkosh, Hannah Jeffrey, Samuel Sonius, Civil Engineering
**Mentors:** Kaoru Ikuma, Bryce Trpkosh, Hannah Jeffrey, Samuel Sonius, Civil Engineering

Phage Discovery Lab
**Presenters:** Jared Maas, Austin Becker, Martin Leyhe, Chenxi Li, Microbiology
**Mentors:** Nick Peters, Nancy Boury, Plant Pathology and Microbiology

The Effect of Deicers on Water Quality of Streams in Urban Areas
**Presenters:** Nicole Martindale, Jackson Manthey, John Feldmann, Civil Engineering
**Mentors:** Kaoru Ikuma, Chris Rehmann, Civil, Construction, and Environmental Engineering

Annotation of Two Podoviridae Phage that Infect Microbacterium Foliorum
**Presenters:** Karin Resendiz-Medina, Alex Beers, Seth Taylor, Faith Seggerman, Microbiology
**Mentors:** Nick Peters, Nancy Boury, Plant Pathology and Microbiology

Tracking Of Prominin 1 Gene During Zebrafish Development To Reveal Stem Cell Fate
**Presenters:** Maci Slaybaugh, Jessica Ivey, Julian Chrobak-Prince, Genetics
**Mentors:** Jeff Essner, Allison Birnbaum, Genetics, Development, and Cell Biology

Effectiveness of Rubber Chips in Treating Stormwater
**Presenters:** Nicholas Streit, Josiah Crawford, Ote Albrecht, Civil Engineering, Jake Kraemer, Geology
**Mentors:** Kaoru Ikuma, Chris Rehmann, Civil, Construction, and Environmental Engineering
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Abstracts for the presentations at this year’s Symposium are available on the ISU website:

http://www.undergradresearch.iastate.edu/symposium/