

PROJECT PRESENTATION DAY

April 19, 2019



Worcester Polytechnic Institute

Project sponsors include...

AbbVie	Instrumentation Laboratory	Shape Security
Achaemenid LLC	Juniper Networks	Sitracker
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Dell EMC	Robots in Service of the Environment	
DEXTrust	Raytheon	
DraftKings	Saint-Gobain Abrasives	
EarlySense	Sanofi Genzyme	
GE Healthcare Life Sciences	Scandinavian Panel Systems	



“MilliporeSigma has sponsored a number of Major Qualifying Projects (MQPs) over the past several years. We have been consistently impressed with the technical depth, collaborative approach, and professionalism demonstrated by WPI students in the completion of these projects.”

Michael Whalen

Head of Process and Technology Separations Technology Cluster
MilliporeSigma

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OUR STUDENTS AND FACULTY
GREAT MINDS MULTIPLIED

Project Presentation Day

Once a year, WPI students take time out from their studies to present to their faculty advisors and sponsors the results of their Major Qualifying Projects, or MQPs (one of two significant academic projects all WPI students complete). The MQP is a professional-level design or research experience generally completed in teams and often sponsored by corporations or other external organizations. The projects mirror the kinds of professional work students will tackle in their careers.

The project experience prepares students to lead team efforts, to communicate professionally, to meet deadlines and exceed expectations, to deal with ambiguity and unexpected difficulties, and to consider not just the technical, but the ethical and social dimensions of their work. The projects must be thoroughly documented in written reports, and virtually all teams make oral presentations of their results. These are the presentations you will see today.

Often MQPs lead to publications in peer-reviewed journals, presentations at regional and national conferences, and patents. Some become the foundations for entrepreneurial ventures. Others become useful innovations and products for their corporate sponsors.

But no matter what becomes of an MQP, the chances are it has already served as an effective capstone to a WPI education and a profound steppingstone to a successful and rewarding career and life.

Presentations by Department

2 Aerospace Engineering	14 Humanities and Arts
2 Biology and Biotechnology	15 Interactive Media & Game Development
4 Biomedical Engineering	15 Mathematical Sciences
5 Business	16 Mechanical Engineering
6 Chemical Engineering	19 Physics
8 Chemistry and Biochemistry	20 Professional Writing
9 Civil and Environmental Engineering	20 Robotics Engineering
10 Computer Science	22 Social Science and Policy Studies
13 Electrical and Computer Engineering	

Project Presentation Day Schedule

Aerospace Engineering

Higgins Labs, Room 116

8:30am

Quasi-Static and Dynamic Testing of Composite Materials

Harrison Hertlein, Nathan Siegel, Jacob Wilson, Marysol Zamaniego Cuahonte

Advisor: Nikhil Karanjgaokar

8:50am

Detection and Estimation of a Plume with an Unmanned Terrain Vehicle

Theresa Bender, Katherine Burris, Spencer Herrington, Daniel Weber

Advisor: Michael Demetriou

9:10am

Design of an MAV for the 2019 SAE Aero Design Competition

Diana Celaj, Heather Cummings, Nicholas Cunha, Adam Frewin, Zachary Hearl, Nicholas Manos, Michael Oswald, Amelia Wilson

Advisors: David Olinger, Raghvendra Cowlagi

9:30am

Interfacial Adhesion of Polymer-Metal Composites

Amanda Toledo Barrios

Advisor: Nikhil Karanjgaokar

10:00am

Design and Integration of a High-Powered Model Rocket-I

Colin Cooper, Amanda Dings, Peter Dohn, Jacob Fennick, Kyle Foster, Eve George, Nicholas Lapierre, Ty Moquin

Advisors: Nikolaos Gatsonis, Jun Yang

10:20am

Design and Integration of a High-Powered Model Rocket-II

Alexander Alvarez, Grace Gerhardt, Evan Kelly, John O'Neill, Jackson Whitehouse

Advisors: Michael Demetriou, John Blandino

10:40am

Design and Integration of a High-Powered Model Rocket - III

Jean Furter, Steffany Halfrey, Mason Handy, Vanessa Legere, Nicolas Lucena Farias, Connor Murphy, Nicholas Songer, Justin Tavares

Advisors: John Blandino, Jagannath Jayachandran

11:00am

Vertical Take-off and Landing Autonomous Aircraft Design

Quintin Barker, Troy Bergeron, Jacob Goldsberry, Romelle Jack, Benjamin Pasculano, Bailey Waterman, Tyler Weiss, Zachary Zolotarevsky

Advisors: Raghvendra Cowlagi, David Olinger

Biology and Biotechnology

POSTER SESSION, 9:30am to 11:30am Rubin Campus Center, Odeum

Relationship between Promensil and Estrogen Receptor Alpha in Breast Cancer Cells

Michael Aquino, Andrew Ellis, Sofia Giansiracusa

Advisors: Jill Rulfs, Mike Buckholt

Mutations in Kinesin 5A Effect on Mitochondrial Mobility in Amyotrophic Lateral Sclerosis and Hereditary Spastic Paraplegia

Jacqueline Garcia

Advisor: Amity Manning

Sponsor: Claudia Fallini, MD, UMMS

In vitro Efficacy of *Artemisia annua* Dried Leaf Extracts against *Candida sp.*

Claire Dickson-Burke, Olivia Gray

Advisor: Pam Weathers

Designing T-cell Receptor Constructs Using Golden Gate Cloning

Maxwell Studley

Advisor: Jill Rulfs

Sponsor: Samuel Behar, MD, UMMS

Investigating the Role of DEAD-box Helicase VBH-1 in *C. Elegans*

Johan Girgenrath

Advisor: Elizabeth Ryder

Sponsor: Craig Mello, MD, UMMS

Sex Pheromone Attractive Response in *C. elegans* and Related Species

Jane Lockery

Advisor: Jagan Srinivasan

The Impact of Composting Worms on Arugula Plant Biomass and the Soil Microbiome in an Organic Living Soil System

Locke Ezra-Ros Bonomo

Advisors: Jill Rulfs, Mike Buckholt

The Gut Microbiome and Cognitive Function of Dementia Patients Living in Long-Term Care Facilities

Allison O'Neill

Advisor: Jill Rulfs

Sponsor: John Harran, MD, UMMS

Investigating the Role of DNA Methylation in *Mycobacterium smegmatis*

Samantha Randall

Advisor: Scarlet Shell

Expression of the Mycobacterial Housekeeping Sigma Factor sigA Is Affected by Sequences in Its 5' UTR and Coding Sequence

Tien Nguyen

Advisor: Scarlet Shell

Nanogold Labeling Reveals a Conformational Change in the Exocyst Complex

Alexander Czuchra

Advisor: Luis Vidali

Sponsor: Mary Munson, UMMS

Investigating the Impact of Fragile X Syndrome on Stress Granule Formation

Brianna Burke, Renee LeClaire, Lindsey Merrill, Solimar Ramis De Ayreflor Reyes

Advisor: Natalie Farny

Granulysin in Cytotoxic CD8 T-Cells

Edith Sawyer

Advisor: Lou Roberts

Sponsor: Samuel Behar, MD, UMMS

Transcriptional Regulation of Non-Coding RNAs by Retinoblastoma Tumor Suppressor Protein

Hammad Sadiq

Advisor: Amity Manning

Laterally Grafted Leaves as Perfusable Scaffolds for Human Cell Culture

Yueqing Wang

Advisor: Pamela Weathers

Using Beta Endorphin as an Opioid Addiction Model in *C. elegans*

Michael Savoie, Bailey Sweet

Advisor: Jagan Srinivasan

Lung Levels of Neutrophil-Related Chemokines Do Not Correlate with *M. tb* Levels in 8 Mouse Strains

Emily McGlone

Advisor: Dave Adams

Sponsor: Gillian Beamer, Cummings School of Veterinary Medicine-Tufts University

Effects of Promensil on T47D Breast Cancer Cells in Regard to Apoptosis, the Cell Cycle, and Estrogen Receptor- α

Daniel Crosby, Madeline Manfra-Levitt,

James Veliz

Advisors: Jill Rulfs, Mike Buckholt

Urban Rodents and Influenza

Joseph Evans, Matthew Araujo

Advisor: Jill Rulfs

Sponsor: Jonathan Runstadler, Cummings School of Veterinary Medicine-Tufts University

Remote Brief Intervention and Referral to Treatment for Alcohol

Brianna Courteau

Advisor: Jill Rulfs

Sponsor: Edwin Boudreaux, UMMS

Whip-Poor-Will Ecology: Arthropod Abundance in Bolton Flats Wildlife Management Area

Elena Stratis, Elizabeth Walkes

Advisor: Marja Bakermans

Investigating A4 Bacteriophage DNA Primase

Daniel Champlin, Eoin O'Connell,

Jennifer Payano

Advisors: Elizabeth Ryder,

JoAnn Whitefleet-Smith

High Throughput Screening in *Caenorhabditis elegans*

Akshaye Amish Shah

Advisor: Elizabeth Ryder

Sponsor: Marian Walhout, UMMS

Pubmed AuthorMap: A Study of Research Collaboration in the Life Science Fields

Amanda Moulaison, Haylea Northcott

Advisors: Dimitry Korkin, Elizabeth Ryder

Sponsor: Amir Mitchell, UMMS

Correlate Analyses for Acutely Infected HIV Progressors and Controllers

Kylie Dickinson

Advisor: Elizabeth Ryder

Sponsor: The Ragon Institute

Phylogenetic Analysis of MyoB in *Physcomitrella patens*

Jordan Flores Hollands

Advisor: Luis Vidali

Low-Temperature Tissue Preservation

Kristen Dettloff, Alicia Howell-Munson,
John Schwamb, Alessandra Torres
Advisors: Elizabeth Ryder, Marsha Rolle,
Destin Heilman (CBC)

Biomedical Engineering

SESSION 1

Salisbury Labs, Room 115 (Kinnicutt)

9:10am

Automated High Throughput Linear Actuator for Engineered Muscle Cells

Benjamin Chaffee (ME), Thomas DiPersio (ME),
Katherine Kowalczyk, Victoria Velashea
Advisor: Kristen Billiar

9:30am

Preventative Wrestler Headgear

Catherine Matyas, Marissa Pereira
Advisor: Tiffany Butler

9:50am

Circulating Cancer Cell Collection Device

Kelly Borden, Sydney Hurley, Rachel Peterson
Advisor: Jeannine Coburn

10:20am

Leef Jerky: A Sustainable Meat Product for a Better Future

Fatin Alkhaledi, Brian Moore,
Alex Rebello, Daniel Sochacki
Advisor: Glenn Gaudette

10:40am

Ultrasound for Knee Osteoarthritis Screening: A Panoramic Reconstruction of the Knee Joint

Rosanna Heidt, Olivia Leavitt, Shion Matsumoto
Advisor: Karen Troy

SESSION II

Salisbury Labs, Room 104

9:10am

Wireless ECG and Pulse Oximeter Sensor

Victoria Crowley, Stephanie Huang (ECE),
Kiriaki Rajotte (ECE), William Wartman (ECE)
Advisors: Yitzhak Mendelson,
Edward Clancy (ECE)

9:30am

Design of a Biomimetic Mechanical Stimulator for Engineered Myocardium

Daniela Cerkanowicz, MacKenzie Conlen,
Shahnaz Ghahremani, Aaron Rosenthal
Advisor: George Pins

9:50am

Protein Releasing Microspheres for an In Vitro Intimal Hyperplasia Model

Mateo Frare, Joshua Manning,
Teniola Oguntolu, Arth Sharma
Advisors: Marsha Rolle, Catherine Whittington

10:20am

Development of a Microscope Stage BioStretch Device for Mechanobiology

Joshua Boynton, Alexander Cruz,
Megan Hendrie, Elizabeth Quevillon
Advisor: Kristen Billiar

10:40am

Warm Skin Preparation Applicators for Reduced Patient Discomfort

Alicia Costi, Ravneet Kaur,
Emily Kolaya, Kalyn Ricciuti
Advisors: Jeannine Coburn, Sarwat Hussain
(UMMS)

SESSION III

Salisbury Labs, Room 105

9:10am

Analysis of Agents for Tissue Cryopreservation

Kristen Dettloff, Alicia Howell (BCB),
John Schwamb, Alessandra Torres (CBC)
Advisors: Marsha Rolle, Destin Heilman (CBC),
Elizabeth Ryder (BCB)

9:30am

Design of a Standardized in vitro Model of Skeletal Muscle Regeneration for Implantable Microthread Scaffolds

Erin Heinle, Emily Morra,
Emily Mossman, Alyssa Paul
Advisors: George Pins, Catherine Whittington

9:50am

Design of a Wearable Sensor System for Prevention of Fatigue-Induced Injuries in Baseball Pitching

Julia Dunn, Lauren Guertin, Madison Michaud
Advisor: Karen Troy

10:20am

Design and Prototyping a Compressive CPR Assistive Device

Benjamin Abram, Eric Chiem (ME),
Zoey Foley, John Ringuette
Advisor: John Sullivan (ME)

10:40am

Image Guided TUR

Graysen DeLuca (ME), Alexander Kuros,
Jameson Moore
Advisors: Songbai Ji, Sarwat Hussain (UMass)

11:00am

Tracking Ultrasound Probe Positions

Franck Coly, Justin Korn,
Angelica Pollard-Knight, Jada Plummer
Advisors: Kwonmoo Lee,
Khashayar Rafatzand (UMMS)

Business

POSTER SESSION, 8:30am to Noon Washburn Shops, Room 229

A Meta-Analysis on Driver Safety and Cannabis Impairment

Wesley Fischer, Nathaniel Lambert, Robert Rosen
Advisors: Dimitrios Koutmos, Jianyu Liang (ME),
Buddika Peiris (MA)

BNP Paribas: Symphony Chatbot

Yiyi Chen, Matthew Nicholson, Yaofeng Wang
Advisors: Kevin Sweeney, Michael Ciaraldi (CS),
Renata Konrad
Sponsor: BNP Paribas

Compostable Tableware

Jessica Hanley, Ryan Herrmann,
Tess Hudak, Rose Lewis, Peter Ross
Advisors: Sarah Wodin-Schwartz (ME),
Walter Towner

Creating a Defect Reporting and Quality Reconciliation System

Cassandra Salafia
Advisors: Walter Towner,
Torbjorn Bergstrom (ME), Helen Vassallo

Design and Analysis of Packaging Methods at PepsiCo Frito-Lay

David Bovich, Lillian Olsen,
Nathan Pietrowicz, Benjamin Seitz
Advisors: Walter Towner,
Torbjorn Bergstrom (ME), Helen Vassallo
Sponsor: PepsiCo Frito-Lay

Designing a Sustainable, Long-term Revenue Model for Turn Back Time

Marc Printz
Advisor: Michael Elmes
Sponsor: Turn Back Time

Effects of Navigation Design in Clinical Decision Aid

Andrew Aberdale
Advisors: Bengisu Tulu, Soussan Djamasbi
Sponsor: UMass Memorial Medical Center

Enhancing the Candidate Recruitment and Application Experience at Pratt and Whitney

Erik Fyrer, Elizabeth Jones, Huaxin Yang
Advisor: Eleanor Loiacono
Sponsor: Pratt & Whitney

Expanding Operations for Battery Steele Brewing

Carrie Pozaic, Cassidy Sequin, Kathleen Sheehy
Advisors: Sharon Johnson,
Stephen Kmiotek (CM)
Sponsor: Battery Steele Brewing

Implementing a Culture of Philanthropy at WPI

Akaash Claypool
Advisor: Francis Hoy
Sponsor: WPI Office of Lifetime Engagement

Improvement of Crew Deployment Procedure

Daniel Suitor
Advisor: Joseph Sarkis
Sponsor: SavATree

Improving Refugee Resettlement in the US Through Analytics

Roberto Esquivel, Toni Joy,
Jean Philippe Miralda, Jenna Vandervort
Advisor: Andrew Trapp
Sponsor: HIAS

Improving U.S. Foster Care Service Allocation: Predicting and Minimizing Days in Care among Children Whose Caretakers Suffer from Substance Abuse

Benjamin Diefendorf, Riley Doherty,
Ryan Tropeano, Kameron Yagoobi
Advisors: Andrew Trapp, Emily Douglas (SSPS)

Integrated Supply Chain and Inventory Management System at Raytheon

Holly Cadran
Advisors: Walter Towner, Michael Ginzberg
Sponsor: Raytheon

Manufacturing System Design for Low-Income Panelized Housing Market

Omran Alomran, Danielle Kennon

Advisors: Walter Towner, Torbjorn Bergstrom (ME), Helen Vassallo

Sponsor: DEXTrust Industries

Marketing Production and Financial Analysis of FDCA

Chang Wu

Advisors: Walter Towner, Helen Vassallo

Novel Marketing Strategy in Emerging Industry

Chase Flibbert

Advisors: Walter Towner, Shari Worthington

Sponsor: Anchor Labs

Opportunity in Knowledge Work Environments: A Case Study of UPS IE

Zachary Rellstab

Advisor: Joe Zhu

Sponsor: UPS

Preventing Burnout in Healthcare Settings Using Mobile Technology

Pawan Dodani, Meghan Flynn,

Tasharah Person, Jerome Santos

Advisors: Bengisu Tulu, Nima Kordzadeh

Sponsor: Reliant Medical Group

Process Improvement and Lean Implementation at Saint-Gobain

Shreeja Bhattacharjee, Nicol Garcia,

Conrad Mera, Hong Chon Ng Fang,

Trung Tran Trong

Advisors: Sharon Johnson, Robert Daniello (ME)

Sponsor: Saint-Gobain Norton Abrasives

Process Improvement at Source International

Waleria Duarte, Nicholas Fontaine,

Veronica Hartnett, Joseph Tomaino

Advisors: Walter Towner, Helen Vassallo

Sponsor: Source International

Process Improvement at Stacy's Pita Chips

Samuel Bacchiocchi, Daniela Baez, Michael

Brooks, Nicholas Lewis, Miguel Vargas

Advisors: Walter Towner, Helen Vassallo

Sponsor: Stacy's Pita Chip Company

Rapscallion Brewery: Canning System Cost Analysis

Casey Hunt, Connor Murphy,

Jaclyn Panneton, Alexandra Ward

Advisor: Joe Zhu

Sponsor: Rapscallion Brewery

Supplier Onboarding and Vendor Digital Identity for State Street Corporation Global Services' Procurement Operation

Mikala Dunbar, Lisandra Lao

Advisors: Kevin Sweeney, Marcel Blais (MA), Stephan Sturm (MA)

Sponsor: State Street Global Services

Supply Chain Disasters and Stock Prices

Brian Amado, Jose Sorto

Advisor: Dimitrios Koutmos

Visual Management Implementation at Primetals Technologies

Alexandra Barber, Hein Htet Hlyan,

Panuwat Kongpornjaras, Adam Maier,

Passavich Nalamlieng, Solomon Ortega

Advisors: Renata Konrad, Walter Towner, Helen Vassallo

Sponsor: Primetals Technologies

WPI Combined Heat and Power Feasibility

Rosie McCarthy, Daly Place, Charles Steele

Advisors: Sharon Johnson, Brian Savilonis (ME)

Sponsor: WPI Facilities Department

Chemical Engineering

POSTER SESSION, 8am to Noon Salisbury Labs, Room 402

The Acid Catalyzed Polycondensation of Furfuryl Alcohol

Katherine Charla, Christopher Cyr,

Sarah McKeage, Kelly Vodola

Advisor: Stephen Kmietek

Taxus Cell Culture to Delivery System: A Novel Approach to Administer Paclitaxel

Dasia Aldarondo, Donald Dione, Adele Werner

Advisors: Susan Roberts, Jeannine Coburn (BME)

Carbon Quantum Dot Solar Cells

Lucas Gagne, Xandria Korn, Alexander Rockcross

Advisors: Michael Timko, Pratap Rao (ME)

Determining the Effect of Ultrasonic Pretreatment on Anaerobic Digestion of Barley Bagasse

Kerry Muenchow

Advisor: Michael Timko

Second Generation Ethanol Production Using Subcritical Water Hydrolysis on Sugarcane Bagasse and Straw

Kyle Hanlon, Marco Interlandi (CHE & PH)

Advisors: Michael Timko,

Germano Iannacchione (PH)

Ocean Spray Craisins

Angela Calvi, John Kahler, James O'Connor,
Robert Papp, Joshua Shukan

Advisors: Stephen Kmiotek, Elizabeth Stewart,
Patricia Stapleton (SS),
Sarah Wodin-Schwartz (ME)

Optimization of the Filtration Method for Yellow Encapsulated Pigment Dispersion

Nikki Loiseau, Lauren Souza

Advisors: Stephen Kmiotek, Elizabeth Stewart

Methods for Modeling Polarons

Thang Duc Pham

Advisor: Aaron Deskins

Hydrothermal Liquefaction of Food Waste

Daniela Fraga, Carla Romo

Advisor: Michael Timko

Design of a Standardized Brew

Michael Ambrose, Marco Gomez

Advisor: Stephen Kmiotek

Photoelectrode Water Decontamination

Salvador Alvarado, Ryan Choate,

Alan Phung, Matthew Scanlon

Advisor: Pratap Rao (ME)

Melt Processing of Bil3Cells

Joshua Usiskin

Advisor: Pratap Rao (ME)

Light Activation of *Xanthrophyllomyces dendrorhous* Metabolites

Celeste Marsan

Advisor: Eric Young

Modification of Back-Surface Contacts to Antimony Sulfide Active Layers Using Carrier- Selective Thionated Perylene Derivatives for Improved Photovoltaic Performance

Curtis Doiron

Advisor: Ronald Grimm (CBC)

Two-Stage Anaerobic Digestion of Orange Peels

Alexis Zoffreo

Advisor: Michael Timko

Low Conversion Ethanol Dehydration

Kyle Werra

Advisor: Michael Timko

Not Presenting Due to Confidentiality— or Presenting for Their Sponsors

Investigating and Mitigating the Capacity Constraints of AbbVie's Ultrapure Water System

Ashley Blanchard, Dominique O'Halloran,
Lawrence Valeros, Olivia Verdone

Advisor: Stephen Kmiotek

Rare Earth Elements and Their Behavior During Water Treatment in Nancy, France

Matthew Biondi, David Lech

Advisor: Stephen Kmiotek

Purgatory Beer Co.'s Fiero Coconut Rum Porter: Grain Investigation

Josie Bradshaw, Marissa Leone

Advisor: Stephen Kmiotek

Investigation of the Effects of Oxygen and Other Considerations on the Shelf-Life of Craft Beer

Joseph Bosco, Jacob Pickett,

Zayla Schaeffer, Samantha Smith

Advisor: Stephen Kmiotek

A Chemical Analysis of Flavor Differences in Porter

Joseph Crognale, Tyler Donovan, Shane O'Dell

Advisor: Stephen Kmiotek

Kinetics of Low Conversion of Ethanol

Kyle Anthony Werra

Advisor: Michael Timko

Char for Water Purification

Josue Canales

Advisor: Michael Timko

Beer: The Key to Hoppiness

John Bauer, Caroline Flynn, Michelle Gencorelli,

Kelly Martin, Hendrick Suwirjo

Advisor: Stephen Kmiotek

Investigation of Yeast Selection and Pitching Rate for the Fiero Coconut Rum Porter

McKenna Dunn, Keely Heyer,

Matthew Milliken, Taylor Thompson

Advisor: Stephen Kmiotek

Anti-Migration Biliary Stent

Mary Davis, Jennifer Mague,

Stephanie Smieszek, Melissa Wojnowski

Advisors: Stephen Kmiotek, Zoe Reidinger (BME)

Apple Yeast Investigation

Alden Graham

Advisor: Eric Young

Investigation of Gas Transport Phenomena in Gas Diffusion Layers of Proton Exchange Membrane Fuel Cells

Laura Auerbach, Deanna Poirier

Advisor: Stephen Kmiotek

Presenting in Department Other Than Chemical Engineering

Designing a Total Organic Fluorine Test Using NMR Analysis: Determining Concentrations of Per-ans Poly-Fluorinated Alkyl Substances (PFAS) in Water Samples

Ashley Choi, Dylan Muisse, Zachary Weiland

Advisors: Nikolaos Kazantzis, Stephen Kmiotek, John Bergendahl (CEE)

Expanding Operations for Battery Steele Brewing

Carrie Pozaic, Cassidy Sequin, Kathleen Sheehy

Advisors: Stephen Kmiotek, Sharon Johnson (IE)

Controlling Bil3 Crystal Orientation Using Close-Space Sublimation for Solar Cell Application

James McRae, Emily Molstad, Risbel Rivas, Emma Ruano

Advisor: Pratap Rao (ME)

Expansion of the Cytochrome P450

Inhibition Assay

Emily Leclerc

Advisor: Destin Heilman

Sponsor: Sanofi Genzyme

Synthesis and Exploration of Tetra-Substituted Porphyrins for Use in a Single-Molecule Organic Solar Cell

Emma Travassos

Advisor: Ronald Grimm

Evaluating Sunscreen Actives and Their Derivatives as Potential Sensitizers in DSSC

Shaun McCoy, Erika Stark

Advisor: Drew Brodeur

Interactions Between Phospholipase C β and Cyclin-dependent Kinase 18 Contribute to the Neuropathogenesis of Alzheimer's Disease

Kate Romero

Advisor: Suzanne Scarlata

Mapping the Domain Structure of Ribonuclease E in *Mycobacterium smegmatis*

Oscar Lee

Advisors: Scarlet Shell (BBT) and José Argüello

Analysis of Type 1 Diabetes through the I-Ag7 MHC Class II Molecule in the Non-Obese Diabetic Mouse Model

Sarah Payne

Advisor: Destin Heilman

Sponsor: UMMS

Structural and Spatial Regulation of Arl8:MyosinXI Interactions in *Physcomitrella* Polarized Tip Growth

Stephen Foley

Advisors: Mary Munson, Luis Vidali (BBT)

Sponsor: National Science Foundation

IQGAP1 Scaffolds EGFR Interactions with Downstream Kinases

Samantha Lindberg

Advisors: Siddartha Yerramilli, Arne Gericke

Encapsulation of Lidocaine into Zein Nanofibers

Xuejun Wang

Advisor: Arne Gericke

Sponsor: Zurich University of Applied Sciences

Autoimmune Antibodies in Multiple Sclerosis

Erica Davis

Advisor: Destin Heilman

Sponsor: Rachel Gerstein (UMMS)

Chemistry and Biochemistry

POSTER SESSION, 9:30 to 11:30am Rubin Campus Center, Odeum

Transcription Factor Up-regulation by High-Fat Diet-Induced Fatty Liver in Mice

Arman Atoofi

Advisors: Suzanne Scarlata,

Joae Wu (UMMHC)

Phosphorylation of the Intracellular Loop of hZIP4 via the ERK2 and JNK2 Pathways

Aylin Padir

Advisor: Elizabeth Bafaro

In vitro Efficacy of *Artemisia annua* Dried Leaf Extracts Against *Candida sp.*

Claire Dickson-Burke, Olivia Gray

Advisors: Pamela Weathers, Arne Gericke

Exploration of the Ability to Use MOFs in Chromatography

Caroline Warchol

Advisor: John MacDonald

Examining Novel Combination Therapies for Pancreatic Cancer Treatment

Michelle Kerns

Advisors: Carissa Olsen and Brian Lewis (UMMS)

Sponsor: UMass Medical School

Low-Temperature Tissue Preservation

Kristen Dettloff, Alicia Howell-Munson,
John Schwamb, Alessandra Torres

Advisors: Destin Heilman, Marsha Rolle (BME),
Elizabeth Ryder (BBT)

Modification of Back-Surface Contacts to Antimony Sulfide Active Layers Using Carrier-Selective Thionated Perylene Derivatives for Improved Photovoltaic Performance

Curtis Doiron

Advisor: Ron Grimm

Civil and Environmental Engineering

POSTER SESSIONS, 1:15 to 3:30pm

Kaven Hall, 1st Floor Hallway

53 Wachusett Street Design

John Bonina, Matthew Rabasco, James Rios

Advisor: Leonard Albano

A Construction Project Management Analysis of Foisie Innovation Studio

Thomas McCarthy, Anis Medjahed,
Alexander Palermo

Advisor: Guillermo Salazar

Acid Rock Drainage/Metal Leaching at Cooledge Brook: Feasibility of Alternative Remedial and Treatment Approaches

Jessica Locke, Rachel Stickle

Advisor: John Bergendahl

Sponsor: Massachusetts Department of Environmental Protection (MassDEP)

Advanced Fire-Resistant Cementitious Material

Katherine Baker

Advisor: Nima Rahbar

An Analysis of Water Quality Issues in Charlton, Mass., and Recommendations for Management and Remediation of Surface Water Bodies

Katelyn Burke, Morgan DeAngelis,
Shannon Ring

Advisor: Jeanine Dudle

Sponsor: Charlton Conservation Commission

Assessing and Reducing the Impacts of Flooding on Transportation in the City of Chelsea, Massachusetts

Megan Concannon, Austin Fabbo,
Francesca Ferrero, Luke Fronhofer, Sarah Sanchez

Advisors: Paul Mathisen, Mingjiang Tao

Sponsor: City of Chelsea

Consideration of an Exterior Water Spray System for the Protection of Residential Structures from the Impingement of Firebrands During a Wildfire Event

Shannon Alvarez, Mitchell Pastizzo (ME)

Advisors: Milosh Puchovsky (FPE),
Albert Simeoni (FPE)

Improving Biosolids Drying with Ultrasonic Technology

Carley Dykstra, Remington Gaetjens

Advisor: John Bergendahl

Park Avenue Redesign

Peter Carosa, Colin Claus, Kimberly Guthrie

Advisors: Leonard Albano, Suzanne LePage

Sponsor: Stantec Consulting

Structural Improvement Design for Northern Strand Community Trail Bridge Over Saugus River

Sean Burke, Marlies de Jong, Benjamin Leveille

Advisors: Leonard Albano, Suzanne LePage

Sponsor: Stantec Consulting Services

Pedestrian Bridge in Institute Park Using Sandwich Structured Composite

Alisa daSilva, Zebadiah Yap-Chung

Advisor: Leonard Albano

Pavement Management Applications in Central Massachusetts

Luca Cerasani, Sam Malafronte,
Connor Sakowich

Advisor: Suzanne LePage

Sponsors: Rutland, Mass. and Woodlands Village

Kaven Hall, 2nd Floor Hallway

PFAS Characterization and Quantitation Using NMR

Ashley Choi (CHE), Dylan Muise (CHE),
Zachary Weiland (CHE)

Advisors: John Bergendahl, Nikoloas Kazantzis (CHE), Stephen Kmietek (CHE)

Redesign of Salisbury Estates

Zachary Abbott, Mark DellaCroce,
Dylan Felty, Tyler Kornacki

Advisor: Leonard Albano

**Stormwater Management and Site
Redevelopment of Memorial Beach**

Emily Cafarelli, Joseph Genga,
Davianna Vasconcelos
Advisor: Suzanne LePage
Sponsor: Town of Webster, Mass.

Sustainable Building Materials

Peter Aliogo (CE/ME), Alexander Avakian (ME),
Talon Boie (ME), Chisom Okafor (ME),
Daniel Venkitachalam (ME)
Advisors: Aaron Sakulich, Wole Soboyejo (ME)

**Understanding the Effects of
Moisture on Hot Mix Asphalt (HMA)**

Austen Crawford
Advisor: Rajib Mallick

**Universidad Tecnológica de Panamá:
Baseline Sustainability Study and
Water Management Systems**

Abigail Ismail (CE/IGS), Jason Morgan,
Sabrina Napoli, Ana Restrepo
Advisors: Tahar El-Korchi, Aaron Sakulich
Sponsors: Universidad Tecnológica de Panamá

**Wind Load Design of a Triangular Shaped
Building Using Finite Element Analysis**

Khant Win Htet
Advisor: Leonard Albano

**WPI Gateway II Photonics Lab Renovation:
Design and Construction Process Analysis
Using 5-D Building Information Modeling
(BIM)**

James Curtin, Constantine Galanis, Shea Mooney
Advisor: Guillermo Salazar

**WPI Replacement to Kaven Hall: Structural
Design**

Laurence Cafaro, Nicholas Day, James Loring,
Eric Schroeder
Advisor: Leonard Albano

**Denitrification using Cyanobacterial-Algal
Mats with Sodium Bicarbonate**

Elisha Musgraves
Advisors: John Bergendahl, Isa Bar-On (ME)

**Quantifying the Pollutant Removal
Effectiveness of Best Management Practices in
Urban Watersheds**

Lucas Acaba, Virginia Adams, Stephen Balcewicz,
Keeghan O'Leary, Kimberly Stanway
Advisors: Paul Mathisen, Harold Walker
Sponsor: Nitsch Engineering

**Rare Earth Elements and their Behavior During
Water Treatment in Nancy, France**

Matthew Biondi
Advisors: Stephen Kmietek, Marie-Noelle Pons
Sponsor: ENISC

Kaven Hall, Room 204

Solar Decathlon Africa: Mechanical Design

Edward Andrews, Ermina Damlamayan
(CE/ME), Nathan Rogers
Advisors: Tahar El-Korchi, Steven Van Dessel

**Structural Design for Oculus:
Solar Decathlon Africa 2019**

Sara Cardona, Mary Sheehan (CE/FPE),
Alana Sher
Advisors: Tahar El-Korchi, Steven Van Dessel

**Solar Decathlon Africa:
Building Envelope Design**

Anqi (Angel) Cao, Julia Karg, Alyssa Konsko
Advisors: Tahar El-Korchi, Steven Van Dessel

**Integration of Food, Energy, and
Water Systems in Affordable Housing**

Nicole Collucci, Yasmeen Logan,
Shealyn Musumeci, Christina Skavicus
Advisors: Leonard Albano,
Soroush Farzin-Moghadam
Sponsor: Worcester Common Ground

**Resurgence Tower—
eVolo Skyscraper Competition**

Michael Brady, Antoine Harris,
Emily Mowatt, Caitlyn Peterson
Advisors: Leonard Albano,
Soroush Farzin-Moghadam

Computer Science

**POSTER SESSION, 10:00am to Noon
Fuller Labs, 3rd Floor Hallway
and Classrooms**

Diagnosing Robotic Swarms (Dr. Swarm)

Josiah Boucher, Jerry Brown,
Erika Snow, Alexandra Wheeler
Advisors: Carlo Pincioli, Lane Harrison

Fraud Detection with ML

Fabio Borges, Adam Camilli, Alazar Genene,
James Kenney, Lucas Sacherer
Advisor: Elke Rundensteiner
Sponsor: ACI Worldwide

**Vocaodoru—Rhythm Gaming and
Artificial Cinematography in Virtual Reality**

David Giangrave, Aidan O'Keefe
Advisors: Jennifer deWinter (IMGD),
Gillian Smith

Deep Learning for Data Privacy Classification

Griffin Bishop, Leo Grande,
Sam Pridotkas, Harry Sadoyan
Advisors: Randy Paffenroth (MA),
Stephan Sturm (MA)
Sponsor: Aristo Consulting
Project Center: Zurich

Robot Tour Guide

Henry Dunphy, Zoraver Kang, William Mosby
Advisors: Greg Fischer, Jing Xiao
Sponsor: AVA Robotics

Bookstand

Stephen Andrews, John Bieber, Ted Bieber
Advisors: Michael Ciaraldi, Joshua Cuneo

Gojin: The Five Gods, A Location-Based Mobile Game for Tourism

Natalie Bloniarz, Daniel Chao, Kailun Liu
Advisor: Gillian Smith
Sponsor: Ritsumeikan University
Project Center: Japan

Yokai no Kogeki

Jason Abel, Adam Moran, Will Suriner
Advisor: Gillian Smith
Sponsor: Osaka University, Takemura Labs
Project Center: Japan

Machine Learning for Mental Health Detection

Jerry Assan, Maurice Flannery, Yufei Gao,
Adonay Resom, Yuxin Wu
Advisor: Elke Rundensteiner

Ben-tomo!

Sean Briggs, David Tang, Jimmy Tran
Advisors: Jennifer DeWinter (IMGD),
Gillian Smith
Project Center: Osaka, Japan

Deep Learning Method for Social Networks

James Corse, Manuel Gonsalves, Daniel McKay
Advisor: Xiangnan Kong

Massachusetts Sober Housing Mobile Application

Jack Charbonneau, Alex Hard, Kyle Savell,
Tom White, Joan Wong
Advisor: Wilson Wong
Sponsor: MA Alliance for Sober Housing

First-Year Hub

Anthony Gringeri, Liana Nguyen,
Amanda Pennie, Sylvia van der Weide
Advisors: Joseph Beck, Robert Traver (UGS)

Washburn Shops Lab Management System

Sam Baumgarten
Advisor: Michael Ciaraldi

LiDAR Collision Detection

Krysta Murdy
Advisors: Hugh Lauer,
Alexander Wyglinski (ECE)

Song Recommendation for Automatic Playlist Continuation

Quinn Averill, Jackson Baker,
Samuel Coache, Steven McAteer
Advisors: Xiangnan Kong, Kyumin Lee

Building a Task Blacklist for Online Social Systems

Trang Ha, Quyen Hoang
Advisor: Kyumin Lee

Influence of End User Activity on Firewalling Decisions

Ryan Wittenberg
Advisors: Lane Harrison, Craig Shue

Detonicon - A Networked Game Utilizing AI to Study the Effects of Latency Compensation

Hung Hong, Antony Qin
Advisor: Mark Claypool

Coq for Formal Verification

Spyridon Antonatos, Matthew McDonald,
Dylan Richardson, Joseph St. Pierre
Advisor: Dan Dougherty

Maximizing the Effect of Redundancy on Fault Diversification Through Core Layout

Alec Kohlhoff, Kyle Scaplen
Advisors: Andrew Clark (ECE), Robert Walls
Sponsor: The MITRE Corporation

Host-Based Traffic Engineering: Network Endpoints with the Capabilities of SDN-Enabled Switches

Jeffrey Estrada, Remy Kaldawy, Julian Lanson
Advisor: Craig Shue

Performance of TCP BBR and CUBIC at the Network Bottleneck

Saahil Claypool
Advisor: Craig Wills

ReVisIt: A Tool for the Passive Evaluation of Interactive Visualizations

Madeline Burke, John Dyer, Luke Gardner
Advisor: Lane Harrison

POSTER SESSION, 1:00 to 3:00pm
Fuller Labs, 3rd Floor Hallway
and Classrooms

HerdHealth

Adam Bettigole, Tessa Garbely,
Taehyun Kim, Jessie Ying
Advisor: Emmanuel Agu

ArchaeoloWizards

Evan Frost, Sam Winter
Advisors: Farley Chery (IMGD),
Charles Roberts, Joshua Rosenstock (IMGD)

Face Id in Classroom Videos

Zarni Phyo
Advisor: Jacob Whitehill

Privacy-Preserving Annotation of Face Images
through Attribute-Preserving Face Synthesis

Sola Shirai
Advisor: Jacob Whitehill

SNAP MQP

Yosuke Nakamura, Jack Palmstrom
Advisor: Michael Ciaraldi

Smart Door Lock

Aleksander Ibro, Augusto Wong, Mario Zyla
Advisors: Michael Ciaraldi,
Maqsood Mughal (ECE)

Investigating the Tradeoffs of GPUs for
Parallel Processes

Freise Jacob
Advisor: Guo Tian

Personality AI Development

Kien Nhan, Jiuchuan Wang
Advisor: Gillian Smith
Project Center: Japan

PMKS+: Migrating a Microsoft Silverlight
Application to a Cross-Browser Platform

Praneeth Appikatla, Griffin Cecil,
Michael Taylor, Dimitrios Tsiakmakis
Advisors: David Brown,
Pradeep Radhakrishnan (ME)

The Design and Implementation of Looping
Constructs for Robots

Rachel Hahn, Ian Johnson, Benjamin Mattiuzzi
Advisor: Michael Gennert (RBE)

Autograder for CS2303

Chang Liu, Tim Whitworth
Advisor: Hugh Lauer

Neural Neural Network

Ryan Racine, Karsten Roberts, Isaac Woods
Advisors: Tian Guo, Xiangnan Kong

Music Info Retrieval and Pain Management

Jesse Gaulin, Andrew Nemeth, Liam Yoo
Advisors: Vincent Manzo (HUA), Wilson Wong

Graph-Based Sports Rankings

Chaiwat Ekkaewnumchai, Connor McNamara,
Kyle Richards, Abigail Roane
Advisors: Gábor Sárközy, Craig Wills

ConText FAERS Interface

Jacob Kaplan, Petern Nolan, Logan Romero
Advisor: Elke Rundensteiner

Metric-Based Classification of Graph Vertices

Daniel Kim, John Pugmire
Advisors: Pdraig O Cathain (MA), Robert Walls

Performing Binary Classification of
Contest Profitability for DraftKings

Sean Brady, Jackson Perry, Jon Venne, Saul Woolf
Advisors: Rick Brown (ECE),
Randy Paffenroth (MA)
Sponsor: DraftKings

CityView+: Enhanced Urban Data Visualization

Frank Campanelli, Zhung Moo Feng, Tarek Safa
Advisor: Yanhua Li

Autonomous Scale Car Using Computer Vision
and Neural Networks

Mitchell Curbelo, Ryan Darnely, Ava Karat,
Krishna Madhurkar, Dylan McKillip,
Ethan Schutzman, Christian Scillitoe
Advisors: Pradeep Radhakrishnan (ME, RBE),
Kaveh Pahlavan (ECE, CS)

Designing an Authentication System for
Augmented Reality Devices

Rushdi Abulhijja, Meghana Bhatia,
Nikolaos Kalampalikis, Alejandro Soler
Advisor: Krishna Venkatasubramanian

NASA RMC 2019

Anh Dao, Luis Delatorre
Advisors: Michael Ciaraldi,
Kenneth Stafford (ME/RBE)

Correcting Errors and
Adding Features to PMKS

Albert Beka, Mitchell Farren, Alexander Galvan,
David Richardson, Zhihao Xie
Advisors: David Brown, Pradeep Radhakrishnan

Piano-Playing Robotic Arm

Thomas Maloney, Anthony Topper
Advisors: Scott Barton, Xiangnan Kong

Generating Solitaire Games

Drew Ciccarelli, Ian MacGregor, Simon Redding
Advisor: George Heineman

Electrical and Computer Engineering

Atwater Kent Labs, Room 219

10:00am

Electrify Atwater Kent

Juan Caraballo, Shannon McCormack,
Jeffrey Wagner

Advisor: John McNeill

10:15am

Fall Detection and Posture Monitoring System

Yifei Jin, Syed Ayaz Naeem, Holly Shumway

Advisors: Ulkuhan Guler, John McNeill

10:30am

An Arithmetic Library for Fully Homomorphic Encryption

Robert Chase, Keith Colbert,
Dominic Fusco, Austin LaBastie

Advisors: William Martin (MS), Berk Sunar

10:45am

Performing Binary Classification of Contest Profitability for Draftkings

Sean Brady, Jackson Perry, Jon Venne, Saul Woolf

Advisors: Donald Brown, Randy Paffenroth (MA)

Sponsor: Draftkings

11:00am

OSIMS—Online System Integrity Monitoring System

Michael Tasellari, Yuchang Zhang

Advisor: Gene Bogdanov

11:30am

Adversary UAV Localization with Software Defined Radio

Ian Gelman, Abdul Hassan, John Loftus

Advisor: Kaveh Pahlavan

11:45am

Comparing the Accuracy and Precision of Bluetooth Low-Energy and Ultra-Wideband Technology for In-Room Positioning

Danielle Kennon, Son Nguyen, Myo Thein

Advisor: Kaveh Pahlavan

12:00pm

KINISI

Gabriel Entov, Lanhao Mao, Cassandra Pepicelli,
Jonathan Tai, Samuel White, Cooper Wolanin

Advisors: Hugh Lauer (CS), Alexander Wyglinski

12:15am

The Detection and Parametric Estimation of Fast-moving Objects for Smart Home Plate Application

Theodore MacLeod, Dominic Palermo,
Michael Panicci

Advisor: Donald Brown

1:00pm

Blindsight

Aatreya Chakravarti, Alan Fernandez, Yeggi Lee

Advisor: Stephen Bitar, Yitzhak Mendelson (BME)

1:15pm

MGH Biomedical Imaging Tools

Ioannis Alexiou

Advisors: Sergey Makarov, William Michalson

1:30pm

Authentication for AR Devices

Alejandro Soler Gayoso

Advisor: Andrew Clark

Atwater Kent Labs, Room 233

10:00am

Wind Speed Surveying Device

Peter Emidy, Christopher Jarrett,
Nicholas Pandolfi, Jonathan Redus

Advisor: Yousef Mahmoud

10:15am

Smart 2-Stage Solar Microinverter

Christian Elzey, Michael Kane, Marmik Patel,
Justin Silkey, Michael Truong

Advisor: Yousef Mahmoud

10:30am

Tidal Energy Surveying

Swan Htet, Zheng Liang, Nicholas Nugent

Advisor: Stephen Bitar, Yousef Mahmoud

10:45am

Rehabilitative Arm Exoskeleton

Eric Carkin, Parker Grant, Bryan Therrien

Advisor: Stephen Bitar, Marko Popovic (RBE),
Joe Stobile (ME)

11:15am

Object Manipulation and Control with a Robotic Hand

Colin Buckley, Bhon Bunnag,
Apiwat Ditthapron, Rebecca Miles

Advisors: Stephen Bitar, Zhi Li (ME)

11:30am

Wireless Electrocardiogram & Pulse Oximeter

Victoria Crowley, Stephanie Huang, Kiriaki Rajotte, William Wartman

Advisors: Edward Clancy, Yitzhak Mendelson (BME)

11:45am

Geolocation Using Smartphone Sensors

Ryan Darnley, Nathaniel Peura, Justin Seeley

Advisor: Edward Clancy

12:00pm

Versatile Solar-powered Charging Platform with Integral Wireless Charging Capability

Nicolas Fabbrini, John Kirwan, William Kirwan, John O'Leary

Advisor: Reinhold Ludwig

12:15pm

Thin Film Solar Cell

Matthew Breidenbach, Nicole Candanedo, Abraham Cano Ventura

Advisor: Maqsood Mughal

1:00pm

AR Assisted Cooking

Mona Elokda, Benjamin Hylak

Advisors: Maqsood Mughal, Gillian Smith (CS), Erin Solovey (CS)

1:15pm

CERBERUS

Kaan Emir, Hannah Olshansky

Advisors: Kenneth Stafford (RBE), Alexander Wyglinski

1:30pm

IoT Spectrum Monitoring and Localization

Lauren Getz, Katherine Smith, William Schwartz

Advisors: Stephen Bitar, Michael Ciaraldi (CS), Alexander Wyglinski

1:45pm

Solar Sanitation Device

John Cerce, Ryan Kent

Advisor: Sergej Makarov

Humanities and Arts

Higgins House, Library

12:30–12:50pm: China Hub

China Project Award winners

Conceptual Redesign of Hangzhou

DAC Biotech's English Website

Dominic Cascino, Paulo Chow, Jose Li, Tsuiyee Ng

Advisors: Wen-Hua Du, Bob Kinicki (CS),
IQP MQP 1st Prize

The Applicability of Carbon Pricing in Hong Kong

Alexandra Auteri, Kristen Chan, Pavee Phongsopa, Eda Zhou

Advisors: Alexander Smith (SSPS), Gu Wang (Math)
IQP MQP 2nd Prize

An Investigation of Cultural Infrastructure in Hangzhou, China to Improve the Quality of Life in Xiasha

Lorenzo Castoldi, Jeremy Jacobs, Alexandra Miller, Caroline Murphy

Advisors: Wen-Hua Du, Bob Kinicki (CS),
IQP MQP Honorable Mention

A Clash of Cultures: Why Uber Failed in China

Griffin Bishop

Advisor: Jennifer Rudolph
HUA Inquiry Seminar 1st Place (tie)

The Nationalism Behind China's Space Aspirations

Samuel Goldman

Advisor: Jennifer Rudolph
HUA Inquiry Seminar 1st Place (tie)

12:50pm

Connecting the Dots: Exploring Social Stigma Through Theatre

Holly Gagnon

Advisor: Despoina Giapoudzi

1:10pm

Historical Assessment of the Transformation of Kibbutzim of the Southern Arava

Morgan Reisinger

Advisor: Bland Addison, Peter Hansen

1:20pm

Lionfish Bot 2.0

Thomas Ralph

Advisor: Peter Hansen

1:40pm

Investigating the Social and Scientific Impact of Biology MQPs

Claire Dickson-Burke

Advisor: Patricia Stapleton (SSPS)

2:00pm

Piano Playing Robotic Arm

Thomas Maloney, Anthony Topper

Advisor: Scott Barton, Xiangnan Kong (CS)

Interactive Media and Game Development

Fuller Labs, Lower Perreault

1:00pm

Reality Wizards

Evan Frost, Samuel Winter

Advisors: Farley Chery, Charlie Roberts,

Joshua Rosenstock

1:20pm

Ellie's Spirit

Karl Rosenfeld, Laura Sawin, Abdah St. Fleur

Advisors: Edward Gutierrez, Brian Moriarty,

Lee Sheldon

1:40pm

World Wizards

Nathaniel Carter

Advisor: Jeffrey Kesselman

2:00pm

Ben-tomo!

Sean Briggs, David Tang, Jimmy Tran

Advisors: Jennifer deWinter, Gillian Smith

Sponsor: Osaka University, Japan

2:20pm

Babies and Basilisks

Paige Cox, Aaron Graham, Hannah Jauris,
Vincent Miller, Edward Shaddock

Advisors: Mark Claypool, Brian Moriarty,

Ralph Sutter

3:00pm

Bound

Leo Bunyea

Advisor: Gillian Smith

3:20pm

Yōkai no Kōgeki

Jason Abel, Adam Moran, William Suriner

Advisors: Jennifer deWinter, Gillian Smith

Sponsor: Osaka University, Japan

3:40pm

Gojin: The Five Gods

Natalie Bloniarz, Daniel Chao, Kailun Liu

Advisors: Jennifer deWinter, Gillian Smith

Sponsor: Ritsumeikan University, Japan

4:00pm

Game Engine IDE

Bailey Sostek

Advisor: Brian Moriarty

4:20pm

Dragonfly Latency

Hung Hong, Antony Quin

Advisor: Mark Claypool

4:40pm

Sigurd Fafnirs-Bane

Grant Frederick

Advisor: Edward Gutierrez, Brian Moriarty

Mathematical Sciences

Higgins Labs, Room 218

9:00am

Particle Resuspension: Experiments, Modeling, and Simulation

Paula Sarrion Silvestre

Advisors: Zhongqiang Zhang, Jian Zou,

David Medich (PH)

9:20am

Quantum Walks on Graphs

Luke Candler Brown

Advisor: William J. Martin

9:40am

Applications of Semidefinite Programming

Caroline Johnston

Advisor: William Martin

10:00am

Explorations of Sequence Risk

John Cohen, Jeremy John, Jacob Steinberg

Advisors: Jon Abraham, Barry Posterro

10:20am

Game Show Math

Marshall Patroia, Corey O'Malley

Advisors: Jon Abraham, Barry Posterro

11:00am

Nanoionic Particle Composite Homogenization

Sean Fraser

Advisor: Joseph Fehribach

11:20am

Performing Binary Classification of Contest Profitability for DraftKings

Sean Brady, Jackson Perry,
Jonathan Venne, Saul Woolf

Advisors: Randy Paffenroth (MA/CS),
Rick Brown (ECE), Jeanine Skorinko (PSY)

Sponsor: DraftKings

11:40pm

Dimensions of Matrix Subalgebras

Phillip Heikoop

Advisor: Pdraig O Cathain

12:00pm

Metric-based Classification of Graphs

Presenters: Daniel Jaewoo Kim, John Pugmire

Advisors: Pdraig O Cathain, Robert Walls (CS)

12:20pm

Supplier Onboarding and Vendor Digital Identity for State Street Corporation Global Services' Procurement Operation

Presenters: Mikala Dunbar, Lisandra Lao

Advisors: Marcel Blais, Kevin Sweeney (BUS),
Stephan Sturm, Michael Ciaraldi (CS)

Sponsor: State Street Corporation

Mechanical Engineering

**POSTER SESSION: 8:30 to 11:30am
Alden Memorial, Great Hall**

Biomechanical Engineering

**Functional Analysis of an Ankle-Foot Orthosis:
The Intrepid Dynamic Exoskeletal Orthosis
(IDEO)**

Andrew Lucy

Advisor: Holly Ault

**Load Absorption Device for
Ice Hockey Shoulder Pads**

Benjamin Aldrich, Matthew Moore,
Kathryn O'Donnell, Andrea Rota

Advisors: Christopher Brown,
Tiffany Butler (BME)

Preventative Care Knee Exoskeleton

Steven Franca, Ariel Goldner, Stephanie Marcucci,
Matthew Schueler, Daniel Wivagg

Advisors: Loris Fichera (CS), Gregory Fischer

Investigation of UCL Tears in Baseball Pitchers

Maddie Brennan, Steven Gallagher,
Benedict Kurtze, Paula Sardi

Advisors: Selcuk Guceri, Marko Popovich (PH)

Soft Ankle Exosuit for Correction of Foot Drop

Joshua Galang, Lauren Morgan-Evans,
Hannah Yeung

Advisors: Selcuk Guceri, Marko Popovic (PH)

**Impact Absorbing Wrist Guard for
Snowboarders**

Cole Godzinski Marc LaBahn,
Hannah Modelski, Kyle Whittaker

Advisor: Fiona Levey

**Fiber Optical Tweezers for
Brain Property Measurements**

Li-Yang Chiang, Matthew DeBenedictis,
Qindong Zhang

Advisor: Yuxiang Liu

Sponsor: National Science Foundation

**Attachable Arm Bike for
Iternative Wheelchair Propulsion**

Heather Bourassa, Kylie Juarez, Erin McCann,
Zoe Schwartz, Caraline Wood

Advisor: Brian Savilonis

**Evaluating Performance Testing Procedures for
Baseball Catchers' Helmets**

Sophia Gervasio, Derek Kruzan,
Walter Kwiecinski, Ryan McLaughlin

Advisor: Brian Savilonis

Design

**Assistive Guitar Plucking Device and
User Interface**

Daniel Farnitano, Laurel Higham,
Victoria Mercouris, Benjamin Shaffer

Advisors: Curtis Abel (UGS), Holly Ault

Sponsor: PAM Band

**Design and Analysis of Packaging Methods at
PepsiCo Frito-Lay**

David Bovich, Lillian Olsen,
Nathan Pietrowicz, Benjamin Seitz

Advisors: Torbjorn Bergstrom,
Walter Towner Jr. (BUS), Helen Vassallo (BUS)

Sponsor: PepsiCo Frito-Lay (Anthony Stolo,
Corn Packaging Supply Chain Leader)

Stylus for Fine-Motor Development

Nathan Rose, Tom Ward, Shane Whittaker

Advisor: Torbjorn Bergstrom

Design of Multi Laser System

Matthew Lund

Advisors: Mehul Bhatia, Rudra Kafle (PH)

**Increasing the Throughput of
3D Printers with Automated Part Removal**

Muhammad Hussain, Brian King, Chris Kirven,
Brian Sayers, Benjamin Secino, Baron Strasburger

Advisors: Mehul Bhatia, Pradeep Radhakrishnan

Edge Design for Performance

Evan Bossio, Sophia Leitzman,
Riley Lopez, Amanda Rodriguez

Advisor: Christopher Brown

Head Injury Prevention – Helmet

Josh Herlands, Austin Linder, Douglas Rives

Advisor: Christopher Brown

Sit Ski by Axiomatic Design

Jared Grier, Austin McCalmont,
David Parker, Jeffrey St. Hilaire

Advisor: Christopher Brown

Sponsor: Robert Neumeister

**Ski Binding Design Suspension System for
Vertical Load Transmission**

Madison Healey, Matthew Newell,
Kendra O'Malley, Connor O'Neill

Advisor: Christopher Brown

**Correcting Errors and
Adding Features to PMKS**

Mitchell Farren, Alexander Galvan, Albert Nana
Beka, David Richardson, Zhihao Xie

Advisors: David Brown (CS),
Pradeep Radhakrishnan

Developing a Device to Place Traffic Cones

Christopher Ferreira, Holly Gagnon,
Zachary Whitmore

Advisor: Eben Cobb

Human Powered Recreation Vehicle

Nolan Bell, Alexander Gallant, Michael Munroe,
Katherine Schweikert

Advisor: Eben Cobb

Pool Chair Lift

Amanda Alves, David Cadilek, Daniel Corwin

Advisor: Eben Cobb

Redesigning the Posterior Pediatric Walker

Julia Decker, Ryan Foley,
Kelly McMahan, Victoria Nassar

Advisor: Eben Cobb

Retractable Traction System

Kaitlyn DaSilva, Karen Mushrall, Martin Walwik

Advisor: Eben Cobb

Recreating Steam Power at WPI

Michael Cooke, Thomas Kouttron

Advisor: Robert Daniello

**Design and Validation of a Novel Mission
Framework for the Detumbling of Rotating
Space Debris Using a Tether-Net Linkage and
Momentum Wheel**

Joshua Desmond, Max Luu, Timothy Stump

Advisors: Frank Dick (PH), Zhikun Hou,
Carlo Pinciroli (CS)

**Design and Optimization of a
Formula SAE Vehicle**

James Chakalos, Justin Dyer, Matthew Freed,
Justin Harris, James Meagher

Advisors: Mustapha Fofana, John Hall,
David Planchard

**Application of VR to the
Engineering Design Process**

Ralph Grzybek, Gregory Pelland,
Maricella Ramirez

Advisor: Cosme Furlong

Sponsor: WPI Academic & Research Computing

**Design, Realization, and Application of an
Ultra-High-Speed Shock Tube for
Middle-Ear Mechanics**

Eli Frank, John Perkoski,
Jacquelyn Roberge, Jessica Walsh

Advisor: Cosme Furlong

Sponsor: Massachusetts Eye and Ear
and Harvard Medical School

Jeffrey Tao Cheng, John Rosowski

**Design and Assembly of
Acetone Distillation System**

Chase Arsenault, Olivia Baranowski,
Nicholas Batchelder, Tyler Costello

Advisor: Selçuk Guçeri

**Design & Development of an Electric-Powered
Hand Truck for In-Home Use**

Azita Bakhtyari, Justin Nguyen,
Ayushka Shrestha, Timothy Tetreault

Advisor: Selçuk Guçeri

Design of an Outrunner Hydrokinetic Turbine

Jillian Chu, Alexander Kim, Joseph Pagliuca

Advisor: Selçuk Guçeri

**Gyroscopic Stabilization for
Uniaxial Rotational Hand Tremor**

David Muse, Ian Sun, Alec Wehse

Advisors: John Hall, David Planchard

3D Printing Material Analysis

Sean Cody, Peter Pham,
Kyle Tyler, Jianqing Zhu

Advisor: Zhikun Hou

Train of Four Monitoring

Christopher Beauregard, Nicholas Bergstrom,
Edward Crofts, Kyler Dillon,
Anastasia Karapangou, Kinsey McNamara
Advisors: Kwonmoo Lee (BME), Ahmet Sabuncu,
Jeanine Skorinko (PSY)

Design and Development of a Football Neck Support and Testing Apparatus

Zachary Bellion, Sean Gillis, Francis Lubega,
Blayne Merchant, Colin Saunders
Advisor: Fiona Levey

Design of a Shoulder Pad to Reduce the Risk of Injury in Men's Lacrosse

Elianna Buckley, Juliana Cabello,
Tristin Carlton, Gabriela Hoops
Advisor: Fiona Levey

SolFly: Solar Energy Tent Fly for Humanitarian Aid

Olivia Jones, Edward Noyes
Advisor: Fiona Levey

Realizing a Compact Neutron Beam Collimator for Neutron Radiography

Calvin Downey, Jessica Elder
Advisors: David Medich (PH), Richard Sisson

Designing Integrated Inputs for a Soft Robotic Mechatronic Tongue

Logan Chen
Advisor: Pradeep Radhakrishnan

Flexible Solar Cell Test Fixture

Laura Bauer, Carl Turnquist, Alexandra Wallace
Advisor: Pratap Rao

Greenhouse Redesign for Elementary Educational Needs (GREEN)

Daniel Barra, Kathleen Nugent, Daniel Ottey,
Adam Peternell, Jonathan Toomey, Sean Traynor
Advisor: Ahmet Sabuncu
Sponsor: Lisa Burris, Turn Back Time Farm

Harvesting Mechanical Energy

Laura Carlson, Theresa Cloutier, Allanah Kalka-
Riffel, Kishan Patel, Kevin Pawlak
Advisor: Brian Savilonis

Small-Scale Vortex Induced Vibration Wind Energy Harvesters

Frank Ciliberto, Carly Neeld,
Brooke Pierce, Ethan Shipulski
Advisor: Brian Savilonis

Sustainable Building Materials

Peter Aliogo, Alexander Avakian, Talon Boie,
Chisom Okafor, Daniel Venkitachalam
Advisor: Winston Soboyejo

Low-Profile Planar Home Speaker System

MacKenzie Hridel, Katherine Novak,
Brent Reissman, Theodore Vangos,
Katherine Williamson
Advisor: Joe Stabile
Sponsor: Bose Corporation

A Biodegradable Alternative to the Single-Use Cup

Jessica Hanley, Ryan Hermann,
Tess Hudak, Rose Lewis, Peter Ross
Advisors: Walter Towner (BUS),
Sarah Wodin-Schwartz

Automated Optical Inspection of MEMS Bases Cochlear Implant Hydrophones

Sarah Bachli, Libertad Escobar,
Angela MacLeod, Colette Ruden
Advisor: Sarah Wodin-Schwartz
Sponsors: UniversitätsSpital Zurich and
Cochlear, Ltd.

Manufacturing

3D Printing Using a PA12/NdFeB Filament

Miles Nallen, Kyle Opiekun, Tyler Rauch
Advisor: Joseph Stabile
Sponsor: Kalenian Foundation

Materials

Investigating the Properties of 3D-Printed Polymer-Metal Composites Containing Surface- Modified Stainless Steel Powder Reinforcement

Joseph Calnan, Andrea Claudio-Palacios,
Jack Grubbs, Richard Smith
Advisors: Germano Iannacchione (PH),
Diana Lados

Buckled Battery Structures

Cesar Guerrero
Advisor: Jianyu Liang, Winston Soboyejo

Fire Helmet Redesign

William Bass, Thomas Chiudina, Max Marks
Advisor: Jianyu Liang

Controlling Bi3 Crystal Orientation Using Close-Space Sublimation for Solar Cell Application

James McRae, Emily Molstad,
Risbel Rivas, Emma Ruano
Advisor: Pratap Rao

Austempering AISI 5160 Steel

Jocelyn Abdallah, Abdullah Al-Shawk
Advisor: Richard Sisson, Mei Yang

Design Flow Electrolysis Cell

Kyle Arnold, Glenndon McCormick
Advisor: Yan Wang

High Entropy Alloys

Arkady Governik, John Haddad, Connor Lemay
Advisor: Yu Zhong
Sponsor: Metal Processing Institute

Robotics Engineering

NASA RMC 2019

Anh Dao, Luis Delatorre
Advisors: Michael Ciaraldi (CS),
Kenneth Stafford

PhleAid: Automated Phlebotomy Assistant

Gabriela Morales-Castillo, Angelina Nicolella,
Carlos Pacheco, Armando Zubillaga
Advisor: Gregory Fischer

Soft Matter Manipulation

Mingqi Shuai, Michelle Zhang
Advisors: Zhi Li, Marko Popovic (PH)

Autonomous Scale Car Using Computer Vision and Neural Network

Mitchell Curbelo, Ryan Darnley, Ava Karet,
Krishna Madhurkar, Dylan McKillip,
Ethan Schutzman, Christian Scillitoe
Advisors: Kaveh Pahlavan (ECE),
Pradeep Radhakrishnan

Developing a Modular Control Moment Gyroscope for Planetary Rover Mobility

Aidan Brawley, Stephen Burke, Fang Han,
Oliver Sanderson, Jeremy Wiles
Advisor: Pradeep Radhakrishnan

Development of a Modular Animatronic Head

Matthew Dick, Owen France,
Richard Hosea, Kevin Le, Rachel Lia,
Patrick Meehan, Kyle Seymour
Advisor: Pradeep Radhakrishnan

Thermofluids

Low Ambient Air Source Heat Pumps Utilizing Cascade Cycles

Stephen Barthold, Brandon Cohen,
Michelle Hull, Tyler Wilson
Advisors: Robert Daniello, Christopher Scarpino
Sponsor: Trane

Phase Change Energy Storage Implementing Recycled Materials

Kieran Bradley, Malachi Nelson,
Jillian Onishi, Christopher Tillotson
Advisor: Selçuk Güçeri

Saving Energy and Cost During Peak Periods

Geraldine Benn, Christine Flores, Alison LaBarge
Advisor: Selçuk Güçeri

Development of an Off-Grid Solar-Powered Milk Refrigeration Solution

Brandon Abad, Michael Curtis, Kyle Havey,
Peter Nash, Joseph Stapleton, Luke Xu
Advisor: Ahmet Sabuncu
Sponsor: Hunt Institute

Atmospheric Water Generation

Christopher Bolsinger, Spencer Ralphs
Advisor: Jamal Yagoobi

Physics

Olin Hall, Room 107

9:00am

Soft Matter Manipulation

Mingqi Shuai, Michelle Zhang (ME, RBE)
Advisors: Zhi Li (ME), Marko Popovic

9:15am

Time-Energy Entangled Quantum Key Distribution Without Franson Interferometry

Ben Child
Advisor: David Medich

9:30am

Fourier Transform Spectroscopy

Darien Gaudet, Hayden Savage
Advisor: Richard Quimby

9:45am

Analysis of Am-241 Resuspension into the Atmosphere

Paula Sarrion Silvestre
Advisor: David Medich

10:00am

Design, Analysis, and Testing of an Electromagnetic Booster Separation System

Justin Tavares
Advisor: David Medich

10:15am

Photoluminescence Spectroscopy of Bismuth Triiodide, a New 2D Material for Photovoltaic Applications

Alexis Buzzell, Andrew Mendizabal
Advisor: Lyubov Titova

10:45am

Modeling and Characterization of Millimeter-wave Photodiodes for Microwave Photonic Integrated Circuits

Erin Morissette
Advisors: Douglas Petkie, Lyubov Titova
Sponsor: MIT Lincoln Laboratory

11:00am

Constructing Two Dimensional Theories of Gravity for Schwarzschild, Reissner-Nordstrom, and Non-Extremal Kerr Black Holes

Nathaniel Mione, Bryannah Voydatch

Advisors: Padmanabhan Aravind, Leo Rodriguez, Shanshan Rodriguez (Grinnell College)

11:15am

Analysis of Millimeter Wave FMCW Radar System for Ranging and Sensing Applications

Jacob Bouchard

Advisor: Douglas Petkie

11:30am

Second Generation Ethanol Production Using Subcritical Water Hydrolysis on Sugarcane Bagasse and Straw

Kyle Hanlon (CHE), Marco Interlandi

Advisors: Germano Iannacchione, Michael Timko (CHE)

11:45am

Stochastic Simulations of Far-from-Equilibrium Thermodynamics

Nicholas Mears

Advisor: Germano Iannacchione

12:00pm

Adhesion Analysis of Fluorescent Nanoparticles with TIRF Microscopy

Taylor Trottier

Advisor: Nancy Burnham

Professional Writing

POSTER SESSION

11:30am to 12:30pm

Higgins House, Great Hall

Analyzing Faculty and Student Perceptions of Writing in the BME Curriculum

Kelly Borden, Sydney Hurley, Rachel Peterson

Advisor: Ryan Madan

Improving Safety in School Zones for Students in the Main South Neighborhood of Worcester, Massachusetts

Sarah Brown

Advisors: Joseph Cullon, Brenton Faber, Suzanne LePage (EVE)

Evaluating the Variability of ED Visits for Intellectually and Developmentally Disabled Patients Compared to National Averages

Brianna Burke

Advisor: Brenton Faber

“Formal and Meaningless” or “Impactful”: Citizen Participation in the Downtown Urban Revitalization Plan

Ryan Cudemus-Brunoli

Advisor: Jennifer deWinter

The Challenges and Importance of Standard Operating Procedures in Small Businesses: A Case Study with Purgatory Beer Company

Caroline Flynn

Advisor: Ryan Madan

Potential Diagnostic Markers Associated with Parkinson’s Disease

Stephen Foley

Advisor: Brenton Faber

Breast Cancer Co-morbidities in Rural Demographics

Madeline Manfra-Levitt

Advisor: Brenton Faber

An Examination of the Technical Writing Genre Through a 3D Printer

Manual Case Study

Miles Nallen

Advisors: Kevin Lewis, Ryan Madan

Public Perceptions of Second Generation Biofuels

Carla Romo

Advisor: Lorraine Higgins

Identity Formation in Paramedic Education

Maxwell Studley

Advisor: Brenton Faber

Robotics Engineering

Foiese Innovation Studio, 2nd Floor

8:15am

Engineered Skeletal Muscle

Michael Antonelli, Lyra Huynh, Deborah Kalambayi, Lara Schmoyer, Nicholas Seagrave

Advisors: Raymond Page (BME), Marko Popovic

8:30am

Wolfgang: An Autonomous Mobile Robot for Outdoor Navigation

Aidan Cookson, Mark Landergan, Sean O’Neil

Advisors: William Michalson, Xinming Huang (ECE)

8:45am

Modular Electric Skateboard (MESB)

Nicholas Fajardo, Phillip Konyeaso,
Zane Weissman
Advisors: Susan Jarvis (ECE), Craig Putnam

9:00am

Telenursing RoboPuppet

Zachary Caplin, Ryan Kennedy, Grant Zahorsky
Advisor: Zhi (Jane) Li

9:15am

Sailbot 2018-2019

Sydney Fisher, Sierra Palmer, Kellen Randall
Advisors: William Michalson, Kenneth Stafford

9:45am

Agriculture SWARM

Anqi Shen, John Stegeman
Advisor: Michael Ciaraldi, Nicholas Bertozzi

10:00am

Soft Matter Manipulation

Mingqi Shuai, Michelle Zhang
Advisors: Zhi (Jane) Li, Marko Popovic

10:15am

A.I. LEGO Sorter

Peter Donaldson, David Jin, Andrew Schueler
Advisors: Brad Miller, Craig Putnam

10:30am

Lionfish Bot 2.0

Alexander Antaya, Katharine Conroy, Eric
Peterson, Thomas Ralph
Advisors: Susan Jarvis (ECE), Brad Miller, Craig
Putnam
Sponsor: Robots in Service of the Environment

10:45am

Oddisy Drone Dispatch System

Noah Hillman, Nick Sorensen,
Marek Travnikar, Steven Viola
Advisors: Nick Bertozzi, Reinhold Ludwig (ECE),
Brad Miller, Carlo Pinciroli

11:15am

**Swarm Construction with Intelligent
Scaffolding**

Albert Enyedy, Felix Sanchez
Advisor: Carlo Pinciroli

11:30am

Walking Quadruped

Nicole Franco, Nicoli Liedtke, Danny Lu
Advisors: Gregory Fischer, William Michalson,
Craig Putnam

11:45am

**Autonomous Scale Car Using
Computer Vision and Neural Networks**

Mitchell Curbelo, Ryan Darnley, Ava Karet,
Krishna Madhurkar, Dylan McKillip,
Ethan Schutzman, Christian Scillitoe
Advisors: Kaveh Pahlavan (ECE),
Pradeep Radhakrishnan

12:00pm

Autonomous RC Car Platform

Jason Ashton, Sean Hunt, Myles Spencer
Advisor: Jie Fu, Michael Gennert

12:15pm

SmallKat

Keion Bisland, Xavier Little, Alex Tacescu
Advisors: Nicholas Bertozzi, Loris Fichera,
Gregory Fischer, Brad Miller

1:00pm

**K.O.L.T.: Known Object Localization
and Tracking**

Nathan Rosenberg
Advisor: William Michalson

1:15pm

Robot Tour Guide

Henry Dunphy, Zoraver Kang, William Mosby
Advisors: Gregory Fischer, Jing Xiao
Sponsor: AVA Robotics

1:30pm

**Object Manipulation and Control
with Robotic Hand**

Colin Buckley, Bhon Bunnag,
Apiwat Ditthapron, Rebecca Miles
Advisors: Stephen Bitar (ECE),
Loris Fichera, Zhi (Jane) Li

1:45pm

Kinisi

Gabriel Entov, Lanhao Mao, Cassandra Pepicelli,
Jonathan Tai, Samuel White, Cooper Wolanin
Advisors: Hugh Lauer (CS),
Alexander Wyglinski (ECE)
Sponsors: SICK Sensor Intelligence, Pico
Technology, Mitsubishi Electric Research Lab,
WPI Society of Automotive Engineers

2:00pm

Diagnosing Robotic Swarms (Dr. Swarm)

Josiah Boucher, Jerry Brown, Erika Snow,
Alexandra Wheeler

Advisors: Carlo Pinciroli, Lane Harrison (CS)

2:30pm

Thermal Infrared Endoscope

Matthew Collins, James Kradjian, Ryan St. Hilaire,
Chenggu Wang, Wentao Yuan

Advisors: Loris Fichera, Gregory Fischer

2:45pm

Autonomous Landmine Detection Rover

Dillon Arnold, Nicholas Lanotte,
Benjamin Wagner, Dan Wensley

Advisors: Nick Bertozzi, Susan Jarvis (ECE),
Craig Putnam

3:00pm

Firefighting Robot

Eva Barinelli, Jacob Berman-Jolton,
Gavin MacNeal, Karina Naras, Yil Verdeja

Advisors: William Michalson, Carlo Pinciroli,
Sarah Wodin-Schwartz (ME)

3:15pm

Increasing the Throughput of 3D Printers with Automated Part Removal

Brian King, Chris Kirven, Hussain Muhammad,
Brian Sayers, Benjamin Secino, Baron Strasburger

Advisors: Mehul Bhatia (ME), Pradeep
Radhakrishnan

3:30pm

Super-elastic Continuum Robot for Endoscopic Articulation and Manipulation (SCREAM)

Zachary Boyer, Cory Broliar,
Benjamin Mart, Kevin O'Brien

Advisors: Loris Fichera, Gregory Fischer,
Kenneth Stafford

4:00pm

Automatic Vehicle Recharging Station

Matthew Fortmeyer, Nikolas Gamarra,
Ryan O'Brien, Jacob Remz

Advisors: Jie Fu, Craig Putnam

4:15pm

Developing a Modular Control Moment Gyroscope for Planetary Rover Mobility

Aidan Brawley, Stephen Burke, Fang Han,
Oliver Sanderson, Jeremy Wiles

Advisor: Pradeep Radhakrishnan

4:30pm

Development of a Modular Animatronic Head

Matthew Dick, Owen France,
Richard Hosea, Kevin Le, Rachel Lia,
Patrick Meehan, Kyle Seymour

Advisor: Pradeep Radhakrishnan

4:45pm

Rehabilitative Arm Exoskeleton

Eric Carkin, Parker Grant, Bryan Therrien

Advisors: Stephen Bitar (ECE), Marko Popovic,
Joseph Stabile (ME)

5:00pm

Investigation of UCL Tears in Baseball Pitchers [Non-judging Presentation]

Maddie Brennan, Steven Gallagher,
Ben Kurtze, Paula Sardi

Advisors: Selçuk Guçeri (ME), Marko Popovic

Social Science and Policy Studies

Salisbury Laboratories, Room 305

9:00am

Train of Four Monitoring

Christopher Beauregard, Nicholas Bergstrom,
Edward Crofts, Kyler Dillon,
Anastasia Karapangou, Kinsey McNamara

Advisors: Kwonmoo Lee (BME),
Ahmet Can Sabuncu (ME), Jeanine Skorinko

9:30am

Choice Effects in Online Daily Fantasy Sports

Sean Brady, Jackson Perry,
Jonathan Venne, Saul Woolf

Advisors: Rick Brown (ECE),
Randy Paffenroth (MA), Jeanine Skorinko

10:00am

The Motivations of Social Tuning: Perspective Taking and Affiliative Motivation

Paul Beatty, Luisa Perez, Daniel Vega

Advisor: Jeanine Skorinko

10:30am

Deeper Learning in Paraguay: Examining Relations between Student Interpersonal, Cognitive, and Emotional Skills, Outcomes, and Career Aspirations at Escuela Agrícola, Paraguay

Maria Daigle

Advisors: Erin Ottmar, Rob Traver

11:00am

**Effects of Cultural Orientation and Harmony
Seeking or Avoiding Rejection Mindset on
Social Tuning in Morocco and the United States**

Jessica Greenleaf

Advisors: Mohamed Brahim (HU),
Jeanine Skorinko

12:30pm

Utilizing ALT for Online Class

Ethan Marshall

Advisors: James Doyle, Oleg Pavlov, Shari Weaver

1:00pm

Creating an SD Modeling API for Games

Jacob Friese

Advisors: Khalid Saeed, Jeff Kesselman (IMGD)

WPI Projects Program and Sponsorship

The projects program at WPI is the university's signature approach to undergraduate education, combining theoretical study with practical problem solving. We bring together the brilliant minds and talents of our student teams and faculty advisors with a wide variety of corporate, government, and nonprofit organizations. Collaboratively, we address real business needs, synergizing to create meaningful results.

Project work is one of the most distinctive aspects of a WPI education and has been at the core of WPI's undergraduate curriculum for more than 45 years. It provides students the opportunity to gain professional skills, a talent for teamwork, and the confidence to dive right in. Together with our corporate partners, we are making progress one project at a time.

WPI welcomes sponsorship for our Major Qualifying Projects. If you are interested in discussing a possible sponsorship opportunity, please contact Sharon Deffely, Executive Director of Academic and Corporate Engagement, at 508-831-5635 or sdeffely@wpi.edu.

Following are some general guidelines for project sponsorship:

- A project cannot be "mission critical" or on the "critical path."
- The best types of projects support or enhance current activities.
- Most MQPs consist of a team of students (2–4) and a faculty advisor, although in some cases—depending upon the scope of the project and the disciplines of the student team—there may be additional advisors.

For more information about sponsoring a project, please visit wpi.edu/+engage.

**To contact a specific academic department, please refer to the list below.
(Note: All numbers begin with 508-831-).**

Aerospace Engineering – 5576

Biology and Biotechnology - 5543

Biomedical Engineering - 5447

Business - 5218

Chemical Engineering - 5250

Chemistry and Biochemistry - 5371

Civil and Environmental Engineering - 5294

Computer Science - 5357

Electrical and Computer Engineering - 5231

Environmental Engineering - 5530

Humanities and Arts - 5246

Interactive Media and Game Development - 4977

Interdisciplinary and Global Studies - 6699

Mathematical Sciences - 5241


Mechanical Engineering - 5236

Physics - 5258

Professional Writing - 5198

Robotics Engineering - 6665

Social Science and Policy Studies - 5296



The newly opened Foisie Innovation Studio includes high-tech classrooms, an innovation and entrepreneurship center, and a global impact lab, making the ideal backdrop for students and faculty to further immerse themselves in WPI's hands-on style of learning.

ABOUT WPI

Founded in 1865 in Worcester, Mass., WPI is one of the nation's first engineering and technology universities. Its 14 academic departments offer more than 50 undergraduate and graduate degree programs in science, engineering, technology, business, the social sciences, and the humanities and arts, leading to bachelor's, master's, and doctoral degrees. WPI's talented faculty work with students on interdisciplinary research that seeks solutions to important and socially relevant problems in fields as diverse as the life sciences and bioengineering, energy, information security, materials processing, and robotics. Students also have the opportunity to make a difference to communities and organizations around the world through the university's innovative Global Projects Program. There are more than 50 WPI project centers throughout the Americas, Africa, Asia-Pacific, and Europe.