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 45 WPI project centers throughout the Americas, Africa, Asia-Pacific, and Europe.
Project Sponsors include...

ACI Worldwide Inc.  
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United Technologies  
University of Massachusetts Medical School  
Unum Group  
West Boylston Municipal Light Plant  
Worcester Art Museum  
Yankee Scientific

"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

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 (MQP). If you are interested in discussing a possible sponsorship opportunity, 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 a "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 on the scope of the project and the disciplines of the student team—there may be additional advisors.

More information about sponsoring a project: wpi.edu/+engage

To contact a specific academic department, refer to the list below. 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
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

3 Aerospace Engineering 15 Environmental Engineering
3 Biology and Biotechnology 16 Humanities and Arts
5 Bioinformatics/Computational Biology 17 Interactive Media & Game Development
5 Biomedical Engineering 17 Mathematical Sciences
6 Business 18 Mechanical Engineering
8 Chemical Engineering 21 Physics
9 Chemistry and Biochemistry 21 Professional Writing
10 Civil and Environmental Engineering 22 Robotics Engineering
12 Computer Science 23 Social Science and Policy Studies
13 Electrical and Computer Engineering
# Project Presentation Day Schedule

## Aerospace Engineering

**Higgins Labs, Room 116**

### 8:30am
**Design of an Unsteady Wind Tunnel**
Thomas Cieslewski, Jackson Gillenwaters, Andrej Samardzic  
Advisor: Seong-kyun Im

### 8:50am
**Design of a Two-Kite Rotary Power Cycle for the WPI Kite-Powered Water Pump**
Michael Gagliano, Daniel Long, Justin Marsh  
Advisor: David Olinger

### 9:10am
**Micro-Aerial Vehicle Design and Optimization**
Michelle Acevedo, Benjamin Andrews, Casey Brown, Christopher Cahill, Ruxandra Duca, Emily Dunham, Mitchell Lentz, Edson Novinyo, Luis Diego Paredes, Emily Perry, Miles Schuler, Ashley Smith, Daniel Thiesse  
Advisors: Anthony Linn, Seong-kyun Im, Nikhil Karanjgaokar

### 9:30am
**Autonomous Quadrotor Navigation and Guidance**
Jonathan Blythe, Krzysztof Borowicz, Alyssa Hollander  
Advisor: Raghvendra Cowalgi

### 10:00am
**Design and Test of a Radio-Frequency Electrothermal Thruster**
Abigail Cervelloni, Jared Kepron, Ian Limon, Christian Zelaya  
Advisor: John Blandino

### 10:20am
**Design and Integration of an Indoor Plume Experimental Setup**
Michael Barney, Stephanie Rivard  
Advisor: Nikolaos Gatsonis

### 10:40am
**Plume Detection Using a Gas-Sensing Mobile Robot**
Nicholas Christie, John Colfer  
Advisor: Michael Demetriou

### 11:00am
**Heterogeneous Network of Autonomous Vehicles**
Binxin Liu, David Moore, Dylan Shields  
Advisors: Raghvendra Cowalgi, Michael Demetriou

## Biology and Biotechnology

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

**Phytoestrogens and Their Effects on Breast Cancer Cell Proliferation**
Sarah Gardinier, Nathan Ferro, Kathleen Tran  
Advisors: Michael Buckholt, Jill Rulfs

**Investigating the Function of DNA Methylation in *M. smegmatis***
Nicholas Lemere  
Advisor: Scarlet Shell

**Conditional Loss-of-Growth 1 (CLoG1) is a Novel Protein That Localizes to Microtubules in *Physcomitrella patens***
Sakshi Khurana  
Advisor: Luis Vidali

**Using Biofilms for the Detection and Bioremediation of Arsenic**
Mitra Marvasti-Sitterly, Kayla DeSanty  
Advisors: Natalie Farny, Michael Buckholt

**Regulation Analysis of SERCA3 Metabolic Pathways in Type-2 Diabetic Human Pancreatic Islet Cells**
Megan Robidas, Victor Chau  
Advisor: David Adams  
Sponsor: Agata Jurczyk, University of Massachusetts Medical School

**ELEXIS--based Characterization of Kek1 Interactions with DER and ErbB2**
Victoria Scott  
Advisor: Joseph Duffy

**Bioindicators**
Gregory Kasper  
Advisor: JoAnn Whitefleet-Smith, Mike Buckholt
Landscapes That Promote Nest Box Occupancy in American Kestrels in Massachusetts
Cara Berner, Francesca Cerio, Paula Miller, Olivia Shraibati
Advisor: Marja Bakermans
Sponsor: Andrew Vitz, Massachusetts State Ornithologist

Artemisinin and Breast Cancer
Rebecca Seymour, Jake Rogers
Advisors: Michael Buckholt, Jill Rulfs

Design and Analysis of Synthetic MMP-9 Sensors as Diagnostic Tools for Concussions
Camneil Daly, Jessica Larsen
Advisors: Natalie Farny, Michael Buckholt

The Importance of Actin Interacting Genes dbn-1, erm-1, plst-1 and F38E9.5 for Pore Forming Toxin Defense in C. elegans
Tammy Zamaitis
Advisor: David Adams
Sponsor: Raffi Aroian, University of Massachusetts Medical School

Stressed Out! Investigating the Effects of Bisphenols on Cellular Stress Response
Christina Noyes, Sarah Monteith, Paulina Karabelas, Paige Salerno
Advisors: Natalie Farny, Michael Buckholt

ELEXIS-based Screen of Human LIGs with ErbB1-4
Julie Mazza
Advisor: Joseph Duffy

Analyzing Profilin Dysfunction in Amyotrophic Lateral Sclerosis
Victoria Botelho
Advisor: Jagan Srinivasan
Sponsor: Daryl Bosco, University of Massachusetts Medical School

Diet Quality and Fast Food Consumption in Relation to Food Reward Sensitivity and Proximity to Fast Food Restaurants Among Pregnant Women
Kathryn Elizabeth Liziewski
Advisor: Jill Rulfs
Sponsor: Molly Waring, University of Massachusetts Medical School

A Pilot Study: Understanding Health Literacy and Linguistic Factors Related to African Immigrant Engagement in Primary Health Care in the U.S.
Nicole Baker
Advisor: Jill Rulfs
Sponsor: Nancy Morris, University of Massachusetts Graduate School of Nursing

The Effects of Punicalagin and Tannic Acid on Caenorhabditis elegans Models of Alzheimer's Disease
Veroniki Nikolaki, Florentia Ong, Veronica Coyle
Advisor: Jagan Srinivasan

Changes in Mitochondrial Fitness of Fibroblasts Due to Oxidative Stress
Sunny Sang Nguyen
Advisor: Tanja Dominko

Creating an Interactive Visualization to Monitor Piping Plovers (Charadrius melodus)
Stephanie Esmond
Advisors: Marja Bakermans, Elizabeth Ryder
Sponsor: Andrew Vitz, Massachusetts State Ornithologist

A Packed-Bed Bioreactor System for Enhancing the Growth of Vero Cells in a Semi-continuous Mode of Operation
Shannon Guertin
Advisors: Joseph Duffy, Kamal Rashid

Lung Macrophage Polarization in Cryptococcus neoformans Murine Infection Model
Maureen Hester
Advisor: David Adams
Sponsor: Stuart Levitz, University of Massachusetts Medical School

Stable Hydrogen Isotope Analysis of American Redstart Rectrices
Lauren Puishys, Elior Anina, Alessandra Cerio, Ashilly Lopes, Yasmeen Luna
Advisor: Marja Bakermans
Sponsor: Andrew Vitz, Massachusetts State Ornithologist

MdmX Suppresses Chromosome Loss and Multipolar Mitosis in a p53-Independent Manner
Nicolle Shandrow
Advisor: Michael Buckholt
Sponsor: Stephen Jones, University of Massachusetts Medical School

The Mycobiome, Identification and Genotyping Candida Species in Clinical Isolates
Heather Bartlett
Advisor: Reeta Rao

Investigating the Role of Kinesin 4-11 in Plant Growth and Chloroplast Photorelocation
Daniel MacVeigh-Fierro
Advisor: Luis Vidali

Yeast ATF2 Gene Expression and Wine Aroma: A Wine Production and Agent-based Modeling Approach
Tete Zhang
Advisors: Tanja Dominko, Elizabeth Ryder
Sponsor: Wine Research Center, University of Nova Gorica
Bioinformatics and Computational Biology

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

Yeast ATF2 gene expression and wine aroma: A wine production and agent-based modeling approach
Tete Zhang
Advisors: Tanja Dominko, Elizabeth Ryder
Sponsor: Wine Research Center, University of Nova Gorica

Exploring the effects of cell structure on plant morphology using time-series microscopy and computer simulations of moss growth
Max Levine
Advisor: Luis Vidali

Development of a ray tracing method for modeling shock wave focusing in a lithotripter
Xavier Jackson
Advisor: Sergey Makarov, Liz Ryder

Biomedical Engineering

SESSION 1: 9:00am to Noon
Salisbury Labs, Room 115 (Kinnicutt)

9:10am
Robust Assay to Study Associative Learning in C. elegans
Dulguun Gantulga, Alexa Hiznay, Julia LaValley, Kevin Lou
Advisors: Dirk Albrecht, James Doyle (SSPS)

9:30am
Dynamic Adjusting Prosthetic Socket
Joshua Friscia (ME), Meagan Hiat (RBE), Mollie Myers, Jacob Zizmor (RBE)
Advisors: Gregory Fischer (RBE), Cagdas Onal (ME)

9:50am
3D Electrospun Tissue Scaffold: Achieving Customized Fiber Alignment
Derek Brinkmann, Grace Davis, Timothy Dow, Zachary Sellman
Advisor: Sakthikumar Ambady

10:10am
Developing an Enzymatic Film for Sensing Lactate In Vitro
Clare Doolin, Nicholas Scrivanich, Brian Sokoloff
Advisors: Anjana Jain, Hong Zhou (CHE)

10:40am
Versatile Data Acquisition System for Upper Extremity Force Sensing
Mary Kate Bindas, Kathleen Correia, Kate Piotrowicz
Advisor: Karen Troy

11:00am
Canine Abdominal Palpation Training Device
Anne Harris, Sean Murphy, Elizabeth Pellegrini, Alexandra Price
Advisors: Zoe Reidinger, Michael Stone (Tufts)

11:10am
Bioreactor and a Novel Microengineered Vascular Network
Kevin Ackerman, Jamal Akid, Amanda Baltazar, Duc Do, Stephanie Fariello
Advisor: George Pins

11:40am
Assistive Aid for Playing the Ukulele by Persons with Duchenne Muscular Dystrophy
Stephanie Arce, Eric Lacroix (ECE), Krisha Nazareth, Alexander Sylvia (ECE), Ruxue Yang (ECE)
Advisors: Edward Clancy (ECE), Stephen Bitar (ECE)

SESSION II: 9:00am to Noon
Salisbury Labs, Room 104

9:10am
Micro-Patterning Cells on Polyacrylamide Hydrogels
Raquel Mendoza Cabral, Connor Darling, Nicolas Silva, Nathalie Zakrzewski
Advisors: Sakthikumar Ambady, Qi Wen (PHY)

9:30am
A Pediatric Neurosurgical Head Fixation Device Utilizing Paddings and Actuation to Prevent Skin Necrosis and Pressure Sores
Kevin Li, Chi Ta
Advisors: Kristen Billiar, Oguz Cataltepe (UMMS)

9:50am
A Papillary Muscle Repositioning Device for the Elimination of Mitral Regurgitation
Nadjia Edwards, Keith Guay, Danielle Healy
Advisors: Glenn Gaudette, John Sullivan (ME)
Theranostics of the Brain: An Integrated Approach of Imaging Targeted Nanoemulsions for Pharmacodynamic Analysis of Glioblastoma and Other Brain Diseases
Collette Bora, Tyler Burns, Katie Candiloro, Deanna Stueber
Advisors: Kwonmoo Lee, Timothy Coleman (Nemucore)

In Vitro Skeletal Muscle Tissue Model by Mechanical Stimulation
Timothy Biliouris, Gaetano Scuderi, Craig Teed
Advisor: Raymond Page

High-Throughput Device for Three-Dimensional Angiogenesis Assays
Kailey Castellano, Dalton Oakley, Sarah Sisson, Daniel Youkana
Advisor: Sakthikumar Ambady

The Design and Testing of a Dynamic Prosthetic Socket
Daniel Felix (ME), Selim Tanriverdi (RBE), Crystal Trivedi, Everett Wenzlaff (ME)
Advisors: Yitzhak Mendelson, Marko Popovic (RBE), Selçuk Güçeri (ME)

Robotic Hand Exoskeleton for Rehabilitation using Gamification and Music Learning
Connor Flanigan (RBE), William Manning (RBE), Elizabeth Martino
Advisors: Marko Popovic (RBE), Scott Barton (RBE)

An Automated Approach: Reducing Cross-Contamination in the Culture of C. elegans
Nour Krayem, Javier Mazo-Nido, Mina Michael, Johanna Santos
Advisor: Dirk Albrecht

Diagnostics: Organs on a Vine
Lindsay Gotts, Jordan Jones, Alison Marotta, Nathaniel Porter, Richard Thyden
Advisor: Glenn Gaudette

Simulating HIV-1 Protease Mutations for Conferred Drug Resistance
Edward Caputo, Sydney Tucker, Paige Waechter
Advisors: Anjana Jain, Celia Schiffer (UMMS)

Tissue Retractor for Distal Radius Fractures
Jacquelyne DiTroia, Caroline Mazzola, Andres Monterroso, Patricia Swierk
Advisors: Kristen Billiar, Samandar Dowlatshahi (UMMS), Raymond Dunn (UMMS)

Incorporating Filastatin into Medical Plastics to Minimize Nosocomial Fungal Infections
Zachary Lipsky, Bonham Pierce (CBC)
Advisors: Marsha Rolle, Destin Heilman (CBC), Paul Kaufman (UMMS)

Analyzing Social Media Weight Loss Interventions at UMMS
Daniel Cane, Vincent Doyle, Yajie Li, Nino Melikidze
Advisor: Diane Strong
Sponsor: UMass Medical School

Cross Disciplinary Project Management
Morgan Hopeman
Advisors: Walter Towner, Helen Vassallo

Designing a Robotic Arm for Moving and Sorting Scraps at Pacific Can, Beijing, China
Mohamad Alblaihess, William Farrar, Fernando Gonzalez, Yifan Shao
Advisors: Amy Zeng, Jianyu Liang (ME)
Sponsor: Pacific Can, Beijing
Evaluating Design Process Efficiency
David Cardenas
Advisor: Walter Towner

Front Plate Manufacturing Process Optimization
Lisa Mendez, Andres Ortiz Rosero, Noelle Ouellette, Emma Raymond
Advisors: Walter Towner, Helen Vassallo, Torbjorn Bergstrom (ME)
Sponsor: Primetals Technologies USA, LLC

The Global Reports Monitor Enhancements
Paul Calamari, Fangming Ning, Rong Tang, Johanna Thomas
Advisors: Kevin Sweeney, Arthur Gerstenfeld, Jon Abraham (MA), Michael Ciaraldi (CS), Xinming Huang (EE)
Sponsor: Barclays PLC

High-Volume Machining Analysis
Anthony Andre, Jacquelyn Fanning, Zachary Grasis
Advisors: Walter Towner, Helen Vassallo, Torbjorn Bergstrom (ME)
Sponsor: IPG Photonics Corporation

Improving Changeover Efficiency in Opticap XL Encapsulation Process
Serhan Delareyna, Emily Doherty, Nicolas Gomez Enriquez Riart, Samantha Kwan
Advisor: Andrew Trapp
Sponsor: Millipore Sigma (EMD)

Improving Delivery Efficiency for DRINK-ME
Yi Yang
Advisor: Sharon Johnson
Sponsor: DrinkMe App (Destination ChengDu Technology LLC)

Improving Supply Chain Processes at EarlySense in Tel Aviv, Israel
Sarah Abell
Advisors: Renata Konrad, Isa Bar-On (ME)
Sponsor: EarlySense

Improving the Drying Process at Pacific Can, Beijing, China
Mohammed Alrayas, Max Arnold, T.D. O’Brien, Lingyi Xu
Advisors: Amy Zeng, Jianyu Liang (ME)
Sponsor: Pacific Can, Beijing

Improving the Drying Technology at Pacific Can, Beijing, China
Rida Fayyaz, Andrew Kenyon, Victor Vazquez
Advisors: Amy Zeng, Jianyu Liang (ME)
Sponsor: Pacific Can, Beijing

Lean Service for the Legacy Gastroscope
Julian Dano, Elizabeth Fitch, Adam Hanna, Stephanie Symecko
Advisors: Sharon Wulf, Renata Konrad
Sponsor: Karl Storz Endovision

Managing Lateness to Improve Process Flow in Primary Care
Amy Stevens
Advisor: Sharon Johnson

Manufacturing Capacity Simulation at Primetals Technologies
Reed Gontarek, Bryan Jung, Zachary Rahl, Emma Raymond, Lailah Thompson
Advisors: Walter Towner, Helen Vassallo
Sponsor: Primetals Technologies USA, LLC

Market Analysis for High Power LED
Aaron Davis, Brianna Goncalves, Zachary Karalis, Chandlor Lyles
Advisor: Adrienne Hall-Phillips

Mindfulness-Based Stress Reduction and College Students
Amber Facchini, Meghan Lutz, Haili Welton
Advisor: Eleanor Loiacono
Sponsor: UMass Memorial Medical Center

Modeling Investor Sentiment to Protect Against Downside Market Risk
Dylan McCarthy
Advisor: Dimitri Koutmous

One Sky SharePoint Form Flow
Philippe Kelley, Nicholas Sloat, Lingyi Xu, Chuankai Zhou
Advisor: Diane Strong
Sponsor: One Sky Community Services

Predicting the Risk and Returns of Individual Stocks Using Google Search Volume
James Costello, Michael Moroney
Advisor: Dimitri Koutmous

The Retractable EKG Wiring Kit
Patrick Finn, Attila Kara
Advisors: Frank Hoy, Karla Mendoza

Social Business Plan and Publishing Proposal for Global Toolkit
Samantha Ervin
Advisors: Karla Mendoza, Robert Krueger (SS)

Universal Design
Abigail DaBoll-Lavoie, Tyler Greff, Jennifer Lally, Kayla McAvoy
Advisor: Soussan Djasmasbi
Sponsor: John Rochford, Director, INDEX Program, Kennedy Shriver Center, UMass Medical School
Using Optimization to Increase Social Impact: Improving Client Scheduling and Distribution for Fundacion Paraguaya
Elia Perez Luna, Veronica Soto-Belloso
Advisors: Andrew Trapp, Karla Mendoza, Peter Hansen (HUA)
Sponsor: Fundacion Paraguaya

The Venture Forum: Marketing and Entrepreneurship
Chad DellaPorta, Carl Pierce
Advisors: Purvi Shah, Frank Hoy
Sponsor: Venture Forum

WPI Alumni Networking Program
Brendan Connolly, Alanah Durr, Sanara Marsh, Elizabeth Phan
Advisors: Jerome Schaufeld, Frank Hoy
Sponsor: WPI Alumni Association

Chemical Engineering

POSTER SESSION, 8:30 to 10:30am
Salisbury Labs, Room 402

Biodiesel from Ethanol
Melissa Boule, Hannah Gallagher, Torin Zonfrelli
Advisor: William M. Clark

Hydrogen Production through Solar Powered Methanol Electrolysis
Thomas Cormier, Oliver Lizotte, Joseph Pizzuto
Advisor: Ravindra Datta

Liquid Metal-Air Battery for Energy Storage
Victor Hu, Huyen Vu, Jacob Zagorski
Advisor: Ravindra Datta

Performance of Biogas-Fed Solid Oxide Fuel Cells
Courtney Jones
Advisors: Ravindra Datta, Joshua Persky

Energy Analysis of Butanol Extraction Using Supercritical Carbon Dioxide
Rachel Cody, Vincent Sabo, Halsey Vandenberg
Advisor: Michael Timko

POSTER SESSION, 10:00am to Noon
Salisbury Labs, Room 402

NFPA 285 Screening Rig Evaluation
Jiawen Dong, Earl Schiffhauer
Advisor: Nicholas Dempsey (FPE)
Kreysler & Associates

Wachusett Filtration Project
Alex Silva, Kevin Truc
Advisor: Stephen Kmiotek
Wachusett Brewing Company

Characterizing Impact of Initial Conditions on Fermentation in Two New Grape Wines
Minxue Jia
Advisors: Drew Brodeur (CBC), Stephen Kmiotek
Sponsor: Zoll Cellars

Zeolite Hydrothermal Stability
Ibrahim Abu Muti, Iordanis Kesisoglou, Nyoca Davis, Abdullah Almaymuni
Advisor: Michael Timko

POSTER SESSION, 8:30 to 10:30am
Salisbury Labs, Room 402

Ammonia Synthesis for Production
Andrew Ollerhead
Advisor: Stephen Kmiotek

Self-Heating Rebar Coatings
Matthew Carpenter, Ryan Loucks
Advisors: Amy Peterson, Aaron Sakulich (CE)

Processing-Property Relationships in 3D Printed Acrylonitrile Butadiene Styrene (ABS)
Analise DeBaie
Advisor: Amy Peterson

Electrode Development of a Lactate Biosensor
George Kuegler, Gianna Terravecchia
Advisor: H. Susan Zhou

Investigation of Fire Performance of Candidate Materials for a Next Generation Fire Attack Hose
Andrea Boxell, Meghan Goodwin
Advisor: Kathy Notarianni (FPE)

POSTER SESSION, 10:00am to Noon
Salisbury Labs, Room 402

Ethanol Dehydration with ZSM-5
Jennifer Coffey, Alexander Zitologi
Advisor: Michael Timko

Extraction of Bio-Butanol Using Supercritical Carbon Dioxide
Chelsea Conlon, David Knutson, Mark Overdevest, Allison Rivard
Advisors: Michael Timko, Geoffrey Tomsett

Design of Biomimetic Catalysts
Rexford Hoadley, Jonathan Vardner
Advisor: Michael Timko

Impact of Accelerated Stress Conditions on the Durability of Gas Diffusion Layers in Polymer Electrolyte Membrane Fuel Cells
Samuel Bergstrom, Brent Young
Advisor: Stephen Kmiotek
Sponsor: ENSIC
Categorizing Lumber Leachate by Tree Species
Meghan Dawe, Caitlin Swalec
Advisor: Stephen Kmiotek
Sponsor: ENSIC

Chemistry and Biochemistry

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

Analysis and Synthesis of Novel Inhibitors of MMPs and other Biological Targets
Tamika Isaac
Advisor: Arne Gericke
Sponsor: Zurich University of Applied Sciences

Liquid-Semiconductor Surface Interactions of Silicon in a Double Liquid Layer Solar Cell
Jessica Taylor
Advisor: Ronald Grimm

Role of CcoA and HmtA in Pseudomonas aeruginosa
Yi Sun
Advisor: José Argüello

Apoptotic Capabilities of Porcine Circovirus 1 Viral Protein 3 as a Function of Subcellular Localization
Katherine Amato
Advisor: Destin Heilman

Knocking out Alpha-1 Antitrypsin Deficiency: The Characterization of a Novel Mouse Model
Brynn Cardozo
Advisor: Destin Heilman
Sponsor: Dr. Christian Mueller, Horae Gene Therapy Center-UMass Medical School

Incorporating Filastatin into Medical Plastics to Minimize Nosocomial Fungal Infections
Bonham Pierce, Zachary Lipsky
Advisors: Destin Heilman, Marsha Rolle (BME)
Sponsor: Dr. Paul Kauffman, UMass Medical School

Synthesis and Analysis of UV-filters Intercalated in Zeolite L
Fengfan Zhu
Advisors: Arne Gericke, Marion Emmert
Sponsor: Zurich University of Applied Sciences

The Effects of Post-Transcriptional Processing on mRNA Stability in M. smegmatis
John de Rivera
Advisors: José Argüello, Scarlet Shell (Bio)

Interactions of Copper Chaperones and Transporters in Sinorhizobium Meliloti
Joshua Hall
Advisor: José Argüello

An Investigation Towards a Selective and Sustainable Separation of Rare Earth Elements Through Liquid-Liquid Extraction.
Vincent Azzolino, Hazel Fargher
Advisor: Marion Emmert

Physical-Mechanical Properties of Hot Melt Extrudates
Hannah Hill
Advisor: Arne Gericke
Sponsor: F. Hoffmann-La Roche Ltd.

Photo-induced Polarization in Light-sensitive Dye Monolayers Measured by Electrical Impedance Spectroscopy
Charles Wentzell
Advisor: Ronald Grimm

The Effects of Targeted RNAi of Multiple RNA Binding Proteins on the Expression Pattern of MEX-3 in the Germline of C. Elegans
Rachel Prescott
Advisor: Destin Heilman
Sponsor: University of Massachusetts Medical School Ryder Lab

Regulation Analysis of SERCA3 Metabolic Pathways in Type-2 Diabetic Human Pancreatic Islet Cells
Victor Chau, Megan Robidas
Advisor: Dave Adams (BB)
Sponsor: University of Massachusetts Medical School, Agata Jurczyk

Using Biofilms for the Detection and Bioremediation of Arsenic
Kayla DeSanty, Mitra Marvasti-Sitterly
Advisors: Mike Buckholt (BB), Natalie Farny (BB)

Fluorescent Tagging and Expression of a Putative Adenine Methyltransferase in Caenorhabditis elegans
Kayleigh Sullivan
Advisor: Destin Heilman
Sponsor: Dr. Sandra V. Vergara, University of Massachusetts Medical School RNA Therapeutics Institute, Mello Lab

Torque Teno Virus: Exploring the Effect of Localization on Apoptotic Ability
Celina Aherrera, Rashid Chatani, Kevin Roopcharan
Advisor: Destin Heilman
Quantifying the Stoichiometry of hZIP4 with Total Internal Reflection Fluorescence Microscopy
Ingrid Marko
Advisor: Robert Dempski
National Institutes of Health

Stressed Out! Investigating the Effects of Bisphenols on the Cellular Stress Response
Paulina Karabelas, Sarah Monteith, Christina Noyes, Paige Salerno
Advisors: Michael Buckholt (BB), Natalie Farny (BB)

Synthesis and Biochemical Evaluation of Hepatitis C Virus NS3/4A Protease Inhibitors
Michael Giroux
Advisors: Akbar Ali (UMass Medical), Robert Dempski
Sponsor: Schiffer Laboratory, UMass Medical School, National Institute of Allergy and Infectious Disease (RO1-AI085051)

Co-H Functionalization of Tertiary Aliphatic Amines Under Mild Conditions
Brian O’Day
Advisor: Marion Emmert

Adolescent Smoking, Memory, and Brain Integrity using Magnetic Resonance Imaging in Rat Model
Sravya Malempati
Advisor: Elizabeth Ryder (BB)
Sponsor: University of Massachusetts

Developing Binary Photocaged Complexes as a Delivery Method of Zinc Metal Ions Across a Cell Membrane
Kady Ferguson
Advisor: Shawn Burdette

Transcriptional Evidence for the Role of the Rootstock in Different Artemisia annua Chemotypes
Hailey Cambra
Advisor: Pamela Weathers (BB)

Investigation of Recombinant Human Müllerian Inhibiting Substance: Expression Vector Analysis and Analytical Method Development
Arianna Nitzel, Saloni Sachar
Advisor: Destin Heilman
Sponsor: Nemucore Medical Innovations, Timothy P. Coleman

Characterizing Impact of Initial Conditions on Fermentation in Two New Grape Wines
Minxue Jia
Advisors: Drew Brodeur, Stephen Kmiotek (ChE)
Sponsor: Zoll Cellars

Civil Engineering

POSTER SESSIONS, 1:15 to 3:30 pm

Kaven Hall, 1st Floor Hallway
*Architectural Engineering Majors

A Design and Communication Strategy for the Crèche Construction in Informal Settlements
Jonathan Mirabito
Advisors: Leonard Albano, Lorraine Higgins (HUA)

Academic Library Design
Rania Attalla, John Patrick Connors
Advisor: Leonard Albano

AEI Design Competition: 888 Boylston Street, Mechanical System Design
Andrea Bourke*, Sophieaktra Chhim*, Despoina Giapoudzi*
Advisors: Leffi Cewe-Malloy, Steven Van Dessel, Kenneth Elovitz, John Sullivan (ME)

AEI Design Competition: 888 Boylston Street, Structural Group 1—Concrete Design
Caroline Bartlett*, Andrea Goldstein*, Ali Yalaz*
Advisor: Leonard Albano, Leffi Cewe-Malloy

AEI Design Competition: 888 Boylston Street, Structural Group 2—Steel Design
Corrado Addonisio Jr.*, Shuhan Li*, Cesar Rodriguez*
Advisor: Leonard Albano, Leffi Cewe-Malloy, Steven Van Dessel
Alternative Gravity Load Resisting System Design for Clark University Alumni & Student Engagement Center
Haley Dyer, Nicholas Engle, Ronelle LeBlanc, Jennifer Wallace
Advisor: Leonard Albano, Guillermo Salazar
Sponsor: Clark University, Consigli Construction

Building Energy Analysis of SGH Office in Waltham, MA
Allyson Smith*, Yun Jae Sohn*
Advisors: Steven Van Dessel
Sponsor: Simpson, Gumpertz & Heger

Development of a Rigorous Conduction Test for a Fire Attack Hose
Patrick Gates, Christopher Scangas
Advisor: Kathy Notariani (FPE)
Sponsor: Last Call Foundation

Fire Behavior of a Fiber Reinforced Polymer Load Bearing Wall
Alexander Klose, Thomas Washburn
Advisor: Nicholas Dembsey (FPE)
Sponsor: Kreysler and Associates

Gateway Campus Center
Zachary Harmony*, Erin Murphy*, Jillian Proulx*, Jeremy Soderholm
Advisors: Leonard Albano, Leffi Cewe-Malloy, Kenneth Elovitz

Gilbertville Mill Restoration Project
Obiora Ofokansi, Lucas Roy
Advisor: Tahar El-Korchi
Sponsor: Pioneer Terminals, Town of Gilbertville

System Identification of Structures Subjected to Human-Induced Vibrations using State-Space Modeling
Nicholaus Crossman
Advisor: Yeesock Kim

Kaven Hall 2nd Floor Hallway
Harnessing Wind Energy: 3D Printing a Small-Scale Wind Turbine with a Fiberglass Converging-Diverging Nozzle
Stacey Chaves(ME), Isabella Sanchez (ME), Eduardo Sandoval (ME)
Advisor: Nima Rahbar

Innovative Uses of BIM for Facility Management
Juan Torres Betancur, Kristen Hunt
Advisor: Guillermo Salazar
Sponsor: Massachusetts Port Authority

Interdisciplinary Design and Analysis of a Warehouse
Tanner Burke, Nicola DiLibero, Malina Ibelle, Julia Macleod
Advisor: Leonard Albano

Multi-Use Academic, Athletic, and Parking Structure Considering Vibration Performance
Alex Bell, Edward Giles, John Karlin, Matthew Sabetta*
Advisor: Leonard Albano

NFPA 285 Screening Rig Evaluation
Jiawen Dong, Shannon Rice, Earl Schiffhauer, Keith Sullivan
Advisor: Nicholas Dembsey (FPE)
Sponsor: Kreysler and Associates

Proposed Design for the WPI Foisie Innovation Studio
Ethan Collins, Vincent D'Ambrosio, Connor Flanagan, Kyle Foley
Advisor: Leonard Albano, Guillermo Salazar

Robert Moses State Park: Field 2 Bathroom Design Recommendations
Christopher Flanagan, Rachel Kennedy*
Advisors: Leonard Albano, Steven Van Dessel
Sponsor: Stantec

Self-Healing Coatings for Steel-Reinforced Infrastructure
Matthew Carpenter (CHE), Ryan Loucks
Advisors: Amy Peterson (CHE), Aaron Sakulich

The Panama Canal Expansion Impacts: Connecting Us to the Future
Abigail Brakenwagen
Advisors: Tahar El-Korchi, Aaron Sakulich
Sponsor: Autoridad del Canal de Panama

The Panama Canal Expansion Impacts: Connecting Us to the Future
Carly Giannini
Advisors: Tahar El-Korchi, Aaron Sakulich
Sponsor: Autoridad del Canal de Panama

The Panama Canal Expansion Impacts: Connecting Us to the Future
Brigitte Perera
Advisors: Tahar El-Korchi, Aaron Sakulich
Sponsor: Autoridad del Canal de Panama

The Panama Canal Expansion Impacts: Connecting Us to the Future
Adrienne Weishaar
Advisors: Tahar El-Korchi, Aaron Sakulich
Sponsor: Autoridad del Canal de Panama
Kaven Hall, Room 116

Thermal and Optical Properties of Phase Change Material
Benjamin Root
Advisors: Mingjiang Tao, Steven Van Dessel

Thermomechanical Performance of Fire Hose Materials
Amy Misera, Tiago Olijnik
Advisors: Nima Rahbar
Sponsor: Last Call Foundation

Treasure Valley Scout Reservation
Sonia Armida Banegas Nuñez*
Advisors: Steven Van Dessel
Sponsor: Treasure Valley Scout Reservation

Treasure Valley Water Distribution System: A Plan for Future Growth
Nicholas Campbell, Adam Carrier, Bryan Sadowski
Advisors: Suzanne LePage, Paul Mathisen
Sponsor: Treasure Valley Scout Reservation

Upgrade Design for Septage Treatment at Pease WWTP in Portsmouth, NH
Ryan Clark, Katherine Hedberg, Rita Newman
Advisors: Fred Hart, Suzanne LePage
Sponsor: Stantec

Computer Science

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

Acoustic Trilateration Search and Rescue Using Swarm Robotics
Corey Aday, Nidhi Diwakar, Daniel Murray
Advisor: Michael Ciaraldi

An Efficient Path Robustness Metric for Compliant Robots
Nathan Hughes
Advisor: Dmitry Berenson

Android Smoking Detection
Steven Ireland, Anthony Romeo
Advisor: Emmanuel Agu

Customize ASSISTments Skill Builders Using Mobile Devices
Anthony Ruffa
Advisor: Neil Heffernan

Data Logger Device for UDS Based Attacks in Automotive Vehicles
Mark Benten, Nicholas Kalamvokis, Santiago Rojas, Brian St. Germain
Advisors: Hugh Lauer, Alexander Wyglinski

De-Mining with UAVs
Tucker Haydon, Arthur Lockman, Greg Tighe
Advisors: William Michalson (ECE), Craig Putnam (RBE)

ELODU: Entity Resolution in Big Data
Duc Pham, Long Vu
Advisor: Mohamed Eltabakh

Endicia Webtools Migration and Optimization
Justin Canas, Nicholas Muesch, Xiaoman Xu
Advisor: David Finkel
Sponsor: Endicia
Project Center: Silicon Valley

Enhancing ACLs with Host-Context
Brett Ammonson, Michael French, Julian Moore
Advisor: Craig Shue

Fitness in Mobile Gaming
Philipp Baumann, Anthony Gallo
Advisor: Emmanuel Agu, Mark Claypool

Freedom Trail Itinerary Application
Samuel Mailand
Advisors: Lane Harrison, Wilson Wong

HERO Glove
Alex Caracappa, Tri Khuu, Peerapat Luxsuwong, Saraj Pirasmepulkul
Advisors: Cagdas Onal (ME), William Michalson

Joins In Quality-Aware Database Systems
Yuchen Liu
Advisor: Mohamed Eltabakh

Reliability Through Deterministic and Secure Random Value Generation
Miguel Mora, Hoang Ngo, Etienne-Alexandre Scraire
Advisor: David Finkel
Sponsor: Shape Security
Project Center: Silicon Valley

Side-channel Resisting Crypto and Program Recognition using Machine Learning
Laurentiu Pavel
Advisor: Thomas Eisenbarth

Software Similarity Detection with Checksims
Michael Andrews, Theodore Meyer
Advisor: Hugh Lauer
**Workflow Web Application Design**
Jiacong Xu, Hui Zheng
Advisors: Michael Ciaraldi, Arthur Gerstenfeld (MG), Kevin Sweeney (MG)
Sponsor: Angelo Gordon & Co.
Project Center: Wall Street

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

**Augmented Reality on Embedded Platforms**
Anthony Dresser, Andrew Weiler, Lukas Hunker
Advisors: Michael Ciaraldi, James Duckworth (ECE)

**Brain Network Analysis**
Thomas Sellie-Lund
Advisor: Xiangnan Kong

**Data Mining for the Financial Market**
Essam Al-Mansouri, Sean Amos
Advisors: Hossein Hakim (ECE), Michael Radzicki (SSPS), Carolina Ruiz

**Data Parallel Simulation of Fluorescent Molecule Diffusion in Arbitrary Cell Geometries Using GPUs**
Cem Unsal
Advisor: Erkan Tuzel (PH)

**Expanding the Functionality of Massachusetts' Technology, Talent and Economy Reporting System (MATTERS)**
Dmytro Bogatov, Jillian Hennessy
Advisor: Elke Rundensteiner

**Facial Recognition using Sparse Data Representation on an Open Source Neural Network Model**
Paula Rudy
Advisor: Michael Gennert

**Firefox Macro Extension**
Peter Craft
Advisor: Michael Ciaraldi

**GRIP**
Jonathan Leitschuh, Thomas Clark
Advisors: Brad Miller (RBE), Michael Gennert

**League of Legends Crawler**
Artian Kica, Andrew LaManna, Tom Paolillo, Lindsay O'Donnell
Advisor: Mark Claypool

**Robot Learning**
Batyrlan Nurbekov
Advisors: Joseph Beck, Michael Gennert

**Scalable Multi-Dimensional Threat Analysis for Financial Risk Analysis**
Jay Baia, Peter Leondires, Kevin Martin, Dalton Tapply
Advisor: Elke Rundensteiner
Sponsor: Eric Gieseke, ACI

**SCREAM: Sensory Channel Remote Execution Attack Methods**
Nicholas Brown, Nilesh Patel, Patrick Plenefisch
Advisors: Thomas Eisenbarth (ECE), Krishna Venkatasubramanian

**SlipBuddy: A Machine Learning-based Mobile Health App to Track and Prevent Overeating**
Joseph Acheson, Joshua Allard, Andrew Busch, Andrew Roskuski
Advisors: Carolina Ruiz, Bengisu Tulu (MG)
Sponsor: UMass Medical School

**Understanding Ad Blockers**
Doruk Uzunoglu
Advisor: Craig Wills

**Visualizing Graphs of Tracks**
Alec Benson, Patrick Lynch
Advisor: Elke A. Rundensteiner
Sponsor: BAE Systems

**Wearable Action Guidance Bands**
Amanda Adkins, Will Barnard, Matt Beardsley, Chas Frick, Samee Swartz
Advisors: Michael Gennert, Hugh Lauer, Fred Looft (ECE)

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**Electrical and Computer Engineering**

Atwater Kent Labs, Room 219

**10:00am**
**An Analysis of WPI’s Power Grid**
Thomas Buonomano, Angela-Marie Conklin, Ryan McQuaid
Advisors: William Grudzinski, John Orr

**10:15am**
**Vehicular Security Review**
Hristos Giannopoulos
Advisor: Alexander Wyglinski

**10:30am**
**Ultrasonic Mapping Device**
Daniel Farrington, Robert Fleming, Daniel Hill, Justin Morrow
Advisor: John Orr
10:45am
**Design of RF Switches**
Colin Cunningham, Petro Papi, Emily Wagner
Advisors: Reinhold Ludwig, John McNeill
Sponsor: Skyworks

11:00am
**Indoor Air Quality Sensor**
Zachary Culp, Shadi Ramadan
Advisors: Stephen Bitar, Hugh Lauer (CS)

11:15am
**Cost Effective EKG**
Jordan Friedman, Sean Murphy, Blaine Reiger
Advisor: Reinhold Ludwig

11:30am
**Wideband VCO for RF Applications**
Redon Hoxha, William Nguyen, Risa Qirollari
Advisor: Reinhold Ludwig

11:45am
**IntelliWay**
Christopher Ellen, Dante A. Pace, Shawn Yoon
Advisors: Mohamed Eltabakh (CS), William Michalson

1:00pm
**Digital Noise Generator**
Karen Fitch, Kathryn Gillis, Abby Harrison
Advisor: Ted Clancy
Sponsor: MIT Lincoln Laboratory

1:15pm
**Giant Magnetoresistive Sensor Applications**
Caroline Atteya, Daniel Campbell, Kuoang Myat
San Oo, Joao Mauricio Vasconcelos
Advisors: Stephen Bitar, John McNeill

1:30pm
**Power Panel Display**
Jonas Ciemny, Alejandro Miranda, Kelsey Powderly
Advisors: Shasmur Mazumder, John McNeill

1:45pm
**Small & Secure Hardware Crypto Core and Program Recognition using Side-Channels**
Laurentiu Pavel
Advisor: Thomas Eisenbarth

2:00pm
**Data Logger Device for UDS Based Attacks in Automotive Vehicles**
Mark Bentson, Brian St. Germain, Santiago Rojas, Nick Kalamvokis
Advisors: Hugh Lauer (CS), Alexander Wyglinski

2:15pm
**Formula SAE Electrical System Design**
Kevin MacDougall, George Randel
Advisor: Fred Looft

2:30pm
**Upgrading Auto Belay Systems**
Thomas Sullivan
Advisor: Fred Looft

2:45pm
**iBeacon for Proximity Broadcasting and Accurate Wi-Fi Localization**
Olawole Tunde-Lukan, Yi Sun, Teng Wang
Advisor: Kaveh Pahlavan

3:00pm
**Real-Time Pedestrian Detection Using an Infrared Camera with a FPGA**
Adam Karcs, Arsene Tchatchoua, Damani Walder
Advisor: Ximing Huang

**Atwater Kent Labs, Room 233**

10:00am
**Propagating Wave Turbine**
Elizabeth Tomko, James Whyte
Advisors: Fred Looft, Brian Savilonis (ME)

10:15am
**Wearable Action Guidance (WAG) Bands**
Amanda Adkins, Matthew Beardsley, Charles Frick, William Barnard, Samantha Swartz
Advisors: Fred Looft, Michael Gennert (RBE), Hugh Lauer (CS)

10:30am
**Fire Containment Drone**
Timothy Neilan, Cam Peterson, David Rubenstein, Bryan Toribio
Advisors: Fred Looft, William Michalson

10:45am
**AURORA: Autonomous Unpowered Recovery of Radiosonde Aircraft**
Richard Eberheim, Nicholas Hassan, Joshua O’Connor
Advisors: Fred Looft, Kenneth Stafford (RBE)

11:00am
**Critter Copter**
Lea Dighello, Kevin Rondinone, John Valley
Advisor: Susan Jarvis
11:15am
Wireless Key Generation
William Edor, Caitlyn Marcoux
Advisor: Lifeng Lai

11:30am
Low Power Skin Impedance Spectrometer
Muhammad Abid, Sara Kim, Tyler Newman, Sebastian Rojas
Advisor: John McNeill
Sponsors: Analog Devices, Allegro Microsystems

11:45am
Accelerating Augmented Reality Video Processing with FPGA’s
Anthony Dresser, Lukas Hunker, Andrew Weiler
Advisors: James Duckworth, Michael Ciaraldi (CS)

1:00pm
Roaming Spirit
Troy Hughes, Solanilla Vincentelli
Advisor: Alexander Wyglinski

1:15pm
Sign Language Glove
Princesa Cloutier, Alex Helderman, Rigen Mehilli
Advisor: Alexander Emanuel, Alexander Wyglinski

1:30pm
Dynamically Adjusting Prosthetic
Joshua Friscia, Meagan Hiatt, Mollie Myers, Jacob Zizmor
Advisors: Gregory Fischer (ME), Cadgas Onal (ME)

1:45pm
Electric Car Proliferation and Acceptability
Jason Correia, Jacob Sussman, George Pytlik, Anthony Ward
Advisor: Alexander Emanuel

2:00pm
Designing a Pseudo Tire Pressure Monitoring System Transmitter using Software Defined Radios
Stella Banou, Felicia Gabriel, Adriana Reyes, Syed Shehroz Hussain
Advisor: Alexander Wyglinski

2:15pm
Ornithopter, Flapping Wings Robotic Bird
Daniel Sanderson (ME), Jourdan McKenna (ECE), Brian Baggaley (ECE), Frederick Wight (CS)
Advisors: Marko Popovic, Hossein Hakim

2:30pm
Smart Road
Jacob Grotton, William Evangelakos, Kaitlin Poss, Christopher Schramm
Advisor: Alexander Wyglinski

2:45pm
Modeling the Instantaneous Power Consumption of an FPGA
Jon P. Gualdarrama
Advisor: Thomas Eisenbarth

3:00pm
RFID for Medical Applications
Brede Doerner
Advisor: Sergey Makarov

Environmental Engineering
POSTER SESSIONS, 1:15 to 3:30pm
Kaven Hall, Room 204

An Analytical Comparison of Ethanolysis and Methanolysis Kinetics and the Refined Biodiesel Product
Melissa Boule (CM), Hannah Gallagher (CM), Torin Zonfrelli (CM, EVE)
Advisors: Suzanne LePage, William Clark (CM)

Alternative Carbon Sources for Denitrification of Wastewater
Deanna Clark, Mikayla Filippone (CHE), Kelsey Ouellette, Hannah Reinertson (CHE)
Advisors: John Bergendahl, Stephen Kmiotek (CHE)
Sponsor: Upper Blackstone Water Pollution Abatement District

Design Improvements for the Activated Sludge Wastewater Treatment System at the American Farm School in Thessaloniki, Greece
Christopher Cerruti, Nikos Kalaizidis, Haley Morgan, Matheus Pereira
Advisors: Bland Addison (HUA), John Bergendahl
Sponsor: American Farm School

Improving the Removal of Emulsified Oil from Wastewater Using Powdered Activated Carbon with a Membrane Bioreactor
Chelsea Costa, Thomas Hoctor, Tatiana Huet De Bacellar, Casey Rota
Advisor: John Bergendahl
Sponsor: Koch Membrane Systems
Lake Wickaboag Water Quality Management
Miryam Becker, Kevin Gray
Advisors: Chrysanthe Demetry, Suzanne LePage
Sponsor: West Brookfield Stormwater Authority

Reducing Nitrogen Loading in Truro, MA
Douglas Geist
Advisor: Jeanine Plummer
Sponsor: Weston & Sampson Engineers

Reducing Phosphorous Contamination in Stormwater Runoff
Robert Antoine, Michael Bowen, Grace Howard
Advisors: Fred Hart, Suzanne LePage
Sponsor: Stantec

Removal of 1,4-Dioxane from Water by UV/TiO2 Advanced Oxidation
Jessica Caccioppoli, David Manhardt
Advisors: John Bergendahl
Sponsor: Zhenhong Yu, Aerodyne

Stormwater Quality and Management Plan for Treasure Valley Scout Reservation
Brittany Colcord, Samantha Foote, Alexandra MacLaren
Advisors: Paul Mathisen
Sponsor: Treasure Valley Scout Reservation

2:30pm
Social Business Plan and Publishing Proposal for Global Toolkit
Samantha Ervin
Advisors: Peter Hansen, Robert Krueger (SSPS), Karla Mendoza-Abarca (Bus)

2:50pm
Improving Routing Decisions at the Fundación Paraguaya
Elia Perez-Luna, Veronica Soto-Bellos
Advisors: Peter Hansen, Karla Mendoza-Abarca (Bus), Andrew Trapp (Bus)

3:10pm
Integrating China into Teaching about Food Security
Yi Sun
Advisors: Jennifer Rudolph, Elisabeth Stoddard (SSPS), Kris Wobbe (CH/BCH)

3:30pm
An Alternate Reality Game with Elements of Experimental Literature
Sean McCarthy
Advisor: Jim Cocola

3:50pm
Directing Earnest (with performance, 3:45)
Maeve McCluskey
Advisor: Susan Vick

Posters

Directing Earnest (with performance, 3:45)
Maeve McCluskey
Advisor: Susan Vick

A Design and Communication Strategy for Creche Construction in Informal Settlements
Johnathan Mirabito
Advisors: Len Albano (CEE), Lorraine Higgins

Grant Writing for Municipalities: Furthering Water Quality Management in the Town of West Brookfield
Kevin Gray
Advisor: Chrysanthe Demetry (ME)

Distribution of Appendicitis Cases in New York State Hospitals
Ahmed Fawad
Advisor: Brenton Faber

Humanities and Arts

Higgins House Library

1:10pm
The Long Island Sound
Erich Weltsek
Advisor: Constance Clark

1:30pm
What’s Bugging Me About Literary Translation: Translating from German to English
Elizabeth Thompson
Advisor: Ulrike Brisson

1:50pm
Environmentalism in Greece and Water Recycling at the American Farm School in Thesaloniki
Nikos Kalaitzidis
Advisor: Bland Addison

2:10pm
Academic Theater Laboratory (Exit the King)
Deapoina Giapoudzi
Advisor: Susan Vick
Interactive Media and Game Development

Fuller Labs, Upper Perreault

1:00pm
City of Tiers
Maeve McCluskey
Advisors: Charles Lee Sheldon, Britton Snyder

1:15pm
A Strategy Puzzle Game Using Behavior Trees
Christopher Gillis, Sean MacEachern, Zackery Mason
Advisor: Charles Rich

1:30pm
An Online Art Museum for the IMGD Program
Rafael Angelo, Keenan Gray, Peter Salem, Aaron Segal, Kevin Zhao
Advisors: Charles Rich, Ralph Sutter

1:45pm
The Piper
Daniel Driggs, William Frick, Jacob Hawes, Derek Johnson
Advisors: Brian Moriarty, Ralph Sutter

2:00pm
Chinmoku
Francesca Carletto-Leon, Dillon DeSimone, Robert McKenna, Samuel Wallach
Advisor: Robert Lindeman
Sponsor: Media Experience Design Lab, Ritsumeikan University
Project Center: Japan Project Center

2:15pm
Procedural Shooter
Eric Faust, John Guerra
Advisors: Brian Moriarty, Charles Rich

2:45pm
An Alternate Reality Game with Elements of Experimental Literature
Sean McCarthy
Advisors: Jim Coclac (HUA), Dean O’Donnell

3:00pm
Displaced
Stephen Long, Ceren Savasan
Advisors: David Finkel, Dean O’Donnell

3:15pm
Storybook MQP
William Blackstone, Nathaniel Bryant, Benjamin Peake, Connor Porell
Advisors: David Finkel, Britton Snyder

3:30pm
The Devil’s Dictionary
Jeffrey Bardon, Shane Stenson
Advisor: Brian Moriarty

3:30pm
Chinmoku
Francesca Carletto-Leon, Dillon DeSimone, Robert McKenna, Samuel Wallach
Advisor: Robert Lindeman
Sponsor: Media Experience Design Lab, Ritsumeikan University
Project Center: Japan Project Center

3:45pm
Hikari Hook: Game Development with the Oculus Rift and Handheld Motion Controllers
Eric Benson, John Breen, Sean Halloran, Andrew Han, Chris Knapp
Advisor: Robert Lindeman
Sponsor: Takemura Lab, Osaka University
Project Center: Japan Project Center

4:00pm
FitU
Robert Esposito, Joseph Hill
Advisors: Emmanuel Agu, Robert Lindeman

Mathematical Sciences

Higgins Labs, Room 218

9:00am
Commercial Property Data Aggregation
Cecily Coia, John Cotter, Samuel Ellison
Scott Lonergan
Advisor: Jon Abraham
Sponsor: Quincy Mutual Insurance Company

9:15am
Economic Scenario Generator
Ahmed Blanco, Caylee Chunga, Branden Diniz, Brittany Mowe, Bowei Wei
Advisors: Jon Abraham, Barry Posterro

9:30am
Sun Life Experience Study
Linette Davis, Tyler Keenan, Dayna Madeiros
Advisor: Jon Abraham
Sponsor: Sun Life Insurance Company

9:45am
Sommerfeld Effect for a Rotor with Asymmetric Support Stiffness
Jiaxun Xie
Advisors: Burt Tilley, Mikhail Dimentberg (ME)
10:00am
Machine Learning Applications
Dennis Silva
Advisor: Sarah Olson

10:15am
Exploiting Vulnerabilities in Homomorphic Encryption
Leonard Fisher
Advisor: William Martin

10:45am
Dynamics of Atomtronic Battery
Hongji Yu
Advisors: Burt Tilley, Alex Zozulya (PH)

11:00am
Inverse Methods for Manifold Learning
Kathleen Kay
Advisor: Randy Paffenroth

11:15am
Spectral Methods for Fractional Laplacian
Zitai Huang, Shuyang Sun
Advisor: Zhongqiang Zhang

11:30am
Arbitrage-Free Pricing of XVA for Options in Discrete Time
Catherine Bonner, Jeremiah Campanelli
Advisors: Stephan Sturm, Gu Wang

11:45am
Calibration of an Optimal Bidding Model for the Mobile Advertisement Markets
Laura Antul
Advisors: Marcel Blais, Stephan Sturm
Sponsor: Chitika

Mechanical Engineering

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

Biomechanical Engineering

Rehabilitative Adult Tricycle
Eric Correia, Jaime Espinola, James Gruenbaum, John Papa
Advisors: Holly Ault, Allen Hoffman

Systems Engineering for Point-of-Care Testing
Maereg Tafesse, Natalie Marquardt
Advisor: Mustapha Fofana

Three-Dimensional Force Sensing System for the Applications of Gait Analysis and Robotics
Jessie Johnson, Selahaddin Ozkan
Advisors: Cagdas Onal, Kristen Billiar

Tibia Fracture Walking Boot: A Strain Controlling Device
Samuel Jacobs, Emily Potter, Nathaniel Sauer, Julie Tevenan
Advisor: Brian Savilonis

Designing an Assistive Mobility Device to Aid in Geriatric Sit to Stand
Olivia Bennett, Sarah Gabor, Samantha Neeno
Advisor: Karen Troy

Design

Engineering and Education for Affordable, Sustainable Rainwater Harvesting in Paraguay
Katherine Picchione
Advisors: Diran Apelian, Robert Traver
Sponsor: Fundación Paraguaya

Powder Feeder Redesign for Laser-Assisted Cold Spray
Eric Jorgensen, Kurt Naugler, Colin Rose, Nicholas Spunar
Advisor: Diran Apelian
Sponsor: IPG Photonics

Improved Reacher-Gripper Device
Nathan Alvord, Matthew Lesonsky, Reed Standley
Advisors: Holly Ault, Allen Hoffman

Axiomatic Design of Football
Liam Koenen, Camden Lariviere
Advisor: Christopher Brown

Improved Alpine Ski Binding
Matthew Clark, Kyle Fortin, Flah Ilyas, John Messier
Advisor: Christopher Brown

Textures for Shoe Soles
Christina Bottom, Taylor Llodra
Advisor: Christopher Brown

Beehive Lifter
Hannah Gouzias, Sarah Smith, Alexander Venditti
Advisors: Eben Cobb, Holly Ault

Carrier Lift
Advisor: Eben Cobb
The Design of an Exoskeleton Arm Brace for Therapeutic Use to Address Ataxia
Lauren Hunt, Amanda Konieczny, Mikayla Pasciuto, Alexander Powers
Advisor: Eben Cobb

Hamstring Muscle Assist Device
Liam Fisher, Christopher Preucil, Eric Williams
Advisor: Eben Cobb

Integrated Rapid Prototyping: Efficient Development of Custom Orthotic Devices
James Nolan, Nicholas Picard, Francois-Xavier Stricker-Krongrad, Eric Zandrow
Advisor: Cosme Furlong
Sponsor: Orthocare Innovations

Indoor/Outdoor Wheelchair
Jacob Mercier, Wilson Bly Rougier, Elizabeth Schofield, George Benda
Advisors: Allen Hoffman, Holly Ault

Designing a Robotic Arm for Moving and Sorting Scraps at Pacific Can, Beijing, China
Mohamad Alblaihess, William Farrar, Fernando Gonzalez, Yifan Shao
Advisors: Jianyu Liang, Amy Zeng

Design of a Flipper Prosthetic for a Kemp’s Ridley Sea Turtle
Vivian Liang, Samantha Varela, Iok Wong
Advisors: Yuxiang Liu, Brian Savilonis

Feedback Control of a Tunable Laser for Cavity Optomechanics Device
Tianchang Gu, Jinliang Ning, Zhijie Wang
Advisors: Yuxiang Liu, Yiming Rong

Thermal Performance Assessment Chamber: The Design and Development of a Novel Fire Attack Hose Testing Apparatus
Camden Knoff, Anthony Capuano, Joshua Donovan, Panyawat Tukaew, Jack Murphy
Advisor: Kathy Notarianni

Design and Testing of Power Cycle Concepts for WPI Kite-Powered Water Pump
Jessie Ciulla, Abdulrahaman Jilani, Joseph Samela, John Scarborough
Advisor: David Olinger

Design and Production of a Scalable 3-D Printed Prosthetic Hand
Sean Greene, Daniel Lipson, Abimael Mercado, Aung Soe
Advisors: David Planchard, Glen Gaudette

SAE Baja Redesign
Ryan Horton, Kenneth McPherson, Jason Mehta, Dylan Stimson
Advisor: David Planchard

Designing and Testing a Dynamic Prosthetic Socket
Daniel Felix, Selim Tanriverdi, Crystal Trivedi, Everett Wenzlaff
Advisors: Marko Popovic, Yitzhak Mendelson, Selçuk Güçeri
Sponsor: Liberating Technologies Incorporated

Automated Design Tool
Felice Mancini, Daniel Grande
Advisor: Pradeep Radhakrishnan

Automation of Manual Assembly
Cameron DeWallace, Justin Hence, James West
Advisor: Pradeep Radhakrishnan
Sponsor: Millipore Sigma

Harnessing Wind Energy: 3D Printing a Small-Scale Wind Turbine with a Fiberglass Converging-Diverging Nozzle
Stacey Chaves, Isabella Sanchez, Eduardo Sandoval
Advisor: Nima Rahbar

Design of a System for in-situ Measurements of Semiconductor-Catalyst Under Strain
Nickolas Burnell, Julianne Flynn, Mitchell Green, Gabriel Ludke
Advisor: Pratap Rao

Designing a Concussion-Reducing Football Helmet
Kelly Beisswanger, Danielle Haley, Glen Morgan, Vincent Tavernelli
Advisor: Brian Savilonis

Water Energy Harvester
Sarah Bailey, Katrina Bradley, Andrea Chan, Nathan Curtis, Lauren Richard
Advisor: Brian Savilonis

A Novel Transmission for a Motorcycle Engine
Ethan Barrieau, Jason Beauregard
Advisor: Christopher Scarpino

Aerial Ice Dam Control and Removal
Stephen Arata, Riley Shoneck, Mitchell Weeks
Advisor: John Sullivan

Body Armor Impact Map System
Carolyn Keyes, Nicholas Potvin, Zachary Richards, Christopher Tolisano
Advisors: John Sullivan, William Michelson
Design and Fabrication of a Stirling Engine  
Pete DiMaggio, Jennifer Eastaugh,  
Justin Fahie, Alex Silk  
Advisor: John Sullivan  

Dog Entertainment  
Arthur Fulgoni, Hector Rivas, Omar Younis  
Advisor: John Sullivan  

Stirling Engine Design and Fabrication  
Alexander Church, Benjamin Greenbaum,  
Cory Stirling  
Advisor: John Sullivan  

The Snow Rake: Removing Snow from Multiple Story Roofs  
Grant Brining, Mark Chakuroff,  
Zachary Charland, Thomas Stanovich  
Advisor: John Sullivan  

Manufacturing  
Analysis of 3D Printed Beams and Truss Bridges  
Aaron Cornelius  
Advisor: Torbjorn Bergstrom  

Surface Metrology of Additive Manufactured Surfaces  
Adam Lemoine, Matthew Mancini, Joseluis Velez  
Advisor: Christopher Brown  

Improving the Drying Technology at Pacific Can, Beijing, China  
Rida Fayyaz, Andrew Kenyon, Victor Vasquez  
Advisors: Jianyu Liang, Amy Zeng  
Sponsor: Pacific Can  

Materials  
Dissimilar Metal Casting  
Rachel Harrison, Scott Olson, Alino Te  
Advisor: Diran Apelian  
Sponsor: Metal Processing Institute  

Friction Testing for Shoe Sole  
Brien Hard, Joe Lidwin, Chris Murray, Connor King  
Advisor: Christopher Brown  

Effects of Intumescent Layering on the Pyrolysis of FRP Systems  
Lewis DuBois, Zhidong He, Adam McNally  
Advisor: Nicholas Dembsey  

Fire Behavior of a Fiber-Reinforced Polymer Load-Bearing Wall  
Paul Esteve, Alexander Klose, Thomas Washburn  
Advisor: Nicholas Dembsey  
Sponsor: Kreyssler and Associates  

Friction Stir Welding of Dissimilar Materials  
Matthew Ryder, Christopher Sample, Jinghan Wu  
Advisor: Diana Lados  

Hybrid Doped Silica Aerogels  
Evan Baum, Corey Richards  
Advisor: Balaji Panchapakesan  

Robotics Engineering  
Fire Containment Drone  
Cameron Peterson, Bryan Toribio,  
Tim Neilan, David Rubenstein  
Advisors: William Michelson, Fred Looft  

Foldable Micro Aerial Vehicles  
Fuchen Chen, Weijia Tao, Daibai Zhang  
Advisor: Cagdas Onal  

HERO Glove  
Alex Caracappa, Tri Khuu,  
Peerapat Luxsuwong, Saraj Pirasmepulkul  
Advisors: Cagdas Onal, William Michelson  
Sponsor: Soft Robotics Lab at WPI  

Hydro-Muscle Actuated Exo-Legs for Therapy and Video Gaming  
Nicholas Benson, Jason Hyacinthe,  
Steven Ruotolo, Chenwei Zhang  
Advisors: Marko Popovic, Eben Cobb, Charles Sheldon  

Ornithopter, Flapping Wing Robot  
Brian Baggage, Jourdan McKenna,  
Daniel Sanderson, Frederick Wight  
Advisors: Marko Popovic, Hossein Hakim, Dmitry Berenson  

Lower-limb Exoskeleton Design  
Brian Flynn  
Advisors: Yiming Rong, Pradeep Radhakrishnan  

Thermofluids  
NFPA 285 Screening Rig Evaluation  
Michelle Dong, Shannon Rice,  
Earl Schiffhauer, Keith Sullivan  
Advisor: Nicholas Dembsey  
Sponsor: Kreyssler and Associates  

Alternative Methods of Aircraft Braking  
Matthew Dunster, Thomas Nuthman,  
Gregory Stockman, Nathan Varney  
Advisor: Mustapha Fofana  
Sponsor: United Technologies Research Center  

Heat Transfer Demo Cart  
Kyle LeBorgne, Foster Lee,  
João Vasconcelos, Robert Wood  
Advisor: Selçuk Güçeri  

Forensic Fire Scene Analysis Using Computational Fluid Dynamics  
Francisco Kang, Raeshawn Kennedy,  
Bernard Rabidou, Dimitrios Savva  
Advisors: Milosh Puchovsky, Christopher Wood
Integration of a CHP Unit into the Worcester County Jail
Ryan Carello, Thomas Fay, Nathan Ghion, Stefan Smith
Advisor: Brian Savilonis
Sponsor: West Boylston Municipal Lighting Plant

Electrohydrodynamic Conduction Pumping in Micro-Scale with Two-Phase Flow
Darien Khea, Ahmed Hossain
Advisor: Jamal Yagoobi

Fluid Flow Distribution Control in Micro-Scale with EHD Conduction Pumping Mechanism
Tobin Dancy, Omesh Kamat, Tommy Larkin
Advisor: Jamal Yagoobi

Thermal Analysis of Packaging with Phase-Change Material
Gabriel Hall
Advisor: Jamal Yagoobi

Physics
Olin Hall, Room 107

9:00am
Single Measurement Air Kerma Strength Calibration Geometry
Erika Kollitz
Advisors: Robert Dempski (CBC), David Medich

9:15am
Tachyons and Other Things Fast: A Study of Superluminal Motion
Alejandro Leiro
Advisor: P. K. Aravind

9:30am
Wachusett Filtration Project
Edward Jarvis, Alex Silva, Hayden Small, Kevin Truc
Advisors: Stephen Kmiotek (CHE), Sabyasachi Sarkar
Sponsor: Wachusett Brewing Company

9:45am
Dynamics of Atomtronic Battery
Hongji Yu
Advisors: Bert Tilley (MA), Alex Zozulya

10:00am
The Design and Testing of a Dynamic Prosthetic Socket
Daniel Felix, Selim Tanriverdi, Crystal Trivedi, Everett Wenzlaff
Advisors: Selçuk Güçeri (ME), Yitzhak Mendelson (BME), Marko Popovic

10:15am
Ornithopter, Flapping Wings Robotic Bird
Brian Baggaley, Jourdan McKenna, Daniel Sanderson, Frederick Wight
Advisors: Hossein Hakim (ECE), Marko Popovic

10:30am
Data Parallel Simulation of Fluorescent Molecule Diffusion in Arbitrary Cell Geometries Using GPUs
Cem Unsal
Advisor: Erkan Tuzel

10:45am
Hydro Muscles Actuated Exo-legs for Therapy and Games
Nicholas Benson, Zhang Chenwei, Jason Hyacinthe, Steven Ruotolo
Advisors: Eben Cobb (ME), Charles Lee Sheldon (IMGD), Marko Popovic

11:00am
Radiochromic Film Dosimetry
Nicole Beinstein
Advisor: David Medich

11:15am
Listening to Light
Ryan Lang, Amanda Varrichione
Advisor: Richard Quimby

11:30am
Investigating High-temperature Gas-cooled Modular Reactors for Research Applications
Emilia Konert
Advisor: David Medich

Professional Writing

POSTER SESSION: 1:00pm
Higgins House, Library

A Design and Communication Strategy for Creche Construction in Informal Settlements
Jonathan Mirabito
Advisors: Lorraine Higgins, Len Albano

Grant Writing for Municipalities: Furthering Water Quality Management in the Town of West Brookfield
Kevin Gray
Advisor: Chrysanthe Demetry

Distribution of Appendicitis Cases in New York State Hospitals
Ahmed Fawad Hakim
Advisor: Brenton Faber
Robotics Engineering

Atwater Kent Labs, Room 116

10:35am
3D Printing Robot Arm
Monika Danielewicz, William Spurgeon, Mark Swanson, Taylor Vass
Advisors: Torbjorn Bergstrom, Michael Ciaraldi

10:49am
NASA Robotic Mining Challenge
Eleanore Carson, Paul Peterson, Jack Rivadeneira, Nicholas Woodward
Advisor: Michael Ciaraldi

11:03am
Graphically Represented Image Processing Engine
Thomas Clark, Jonathan Leitschuh
Advisors: Michael Gennert, Bradley Miller

11:17am
Wearable Action Guidance Bands
Amanda Adkins, William Barnard, Matthew Beardsley, Charles Frick, Samantha Swartz
Advisors: Michael Gennert, Hugh Lauer, Fred Looft

11:31am
Deep Q-Learning for Walking in Humanoid Robots
Nathan George, Alec Thompson
Advisors: Joseph Beck, Michael Gennert

12:30pm
Acoustic Trilateration Search and Rescue Using Swarm Robotics
Corey Aday, Nidhi Diwakar, Daniel Murray
Advisor: Michael Ciaraldi

12:44pm
Manta Ray Robot
Gabrielle Franzini, Joshua Fuller, John Price, Nathan Schmidt
Advisor: Susan Jarvis

12:58pm
WALRUS Rover Expansion
Ozan Akylidiz, Andrew Davis, Carson Wolf
Advisor: Kenneth Stafford

1:12pm
Aurora
Richard Eberheim, Nicholas Hassan, Joshua O’Connor
Advisors: Fred Looft, Kenneth Stafford

1:26pm
Fire Containment Drone
Timothy Neilan, Cameron Peterson, David Rubenstein, Bryan Toribio
Advisors: Fred Looft, William Michalson

1:55pm
De-mining with UAVs
Tucker Haydon, Arthur Lockman, Gregory Tighe
Advisors: William Michalson, Craig Putnam

2:09pm
HERO Glove
Alexander Caracappa, Tri Khuu, Peerapat Luxsuwong, Saraj Pirasmepulkul
Advisors: William Michalson, Cagdas Onal

2:23pm
Dynamically Adjusting Prosthesis (DAPS)
Joshua Friscia, Meagan Hiatt, Mollie Myers, Jacob Zizmor
Advisors: Gregory Fischer, Cagdas Onal

2:37pm
Polymer Artificial Muscles
William Hunt
Advisor: Cagdas Onal

2:51pm
Foldable Micro Aerial Vehicle
Fuchen Chen, Wei-jia Tao, Dabai Zhang
Advisor: Cagdas Onal

3:20pm
Frankenhand: An Intelligent Prosthetic
Max Merlin, Kathleen Sullivan
Advisor: Cagdas Onal

3:34pm
Control of Humanoid Robots for Manipulation in Unstructured Environments
Perry Franklin
Advisor: Taskin Padir
Sponsor: DARPA

3:48pm
The Design and Testing of a Dynamic Prosthetic Socket
Daniel Felix, Selim Tanriverdi, Crystal Trivedi, Everett Wenzlaff
Advisors: Selçuk Güçeri, Yitzhak Mendelson, Marko Popovic

4:02pm
Gamified Music Learning System with VR Force Feedback
Connor Flanigan, William Manning, Elizabeth Martino
Advisors: Scott Barton, Marko Popovic
4:16pm
Hydro-Muscles Actuated Exo-Legs for Therapy and Games
Nicholas Benson, Zhang Chenwei, Jason Hyacinthe, Steven Ruotolo
Advisors: Eben Cobb, Marko Popovic

4:45pm
Roaming Spirit
Nils Bernhardt, Lukas Brauckmann, Troy Hughes, Guillermo Vincentelli Solanilla
Advisor: Alexander Wyglinski

4:59pm
Auto Belay User Interface
Michelle Gagnon
Advisor: Fred Looft

5:13pm
Robocart: Autonomous Ground Vehicle
Robert Crimmins, Raymond Wang
Advisor: Alexander Wyglinski

5:27pm
Robot Learning
Batyrulan Nurbekov
Advisor: Michael Gennert

5:41pm
Automatic Contact Surface Detection
John William Rogers Pryor
Advisor: Dmitry Berenson

Social Science and Policy Studies
Salisbury Laboratories, Room 305

9:00am
Seeds of STEM: Developing Early Engineering Curriculum
Heather Ullery
Advisor: Melissa Sue John
Sponsor: Institute of Education Sciences

9:30am
Green City Freiburg
Luke Pantuosco (ESS)
Advisors: Robert Krueger, Samuel Moessner

10:00am
Environmental Equality within the MBTA Bus System
Alex Carli-Dorsey (ESS)
Advisor: Robert Krueger

10:30am
Durable Technologies for Producing Public Goods
Jacqueline Ngo
Advisor: Alexander Smith

11:00am
Robust Assay to Study Associative Learning in C. elegans
Dulguun Gantulga (BME), Alex Hiznay (BME), Julia LaValley, Kevin Lou (BME)
Advisors: James Doyle, Dirk Albrecht (BME)

11:30am
Engineering and Education for Affordable, Sustainable Rainwater Harvesting in Paraguay
Katie Picchione
Advisors: Kent Rissmiller, Robert Traver, Diran Apelian

12:00pm
An Atomic Sound
Erich Weltsek (SSPS/HUA)
Advisor: Constance Clark

1:30pm
Feasibility of Snail Farming: A Model for Small Urban Farms to Expand into Niche Markets for Increased Profitability
Derek McMaster (CS), Alena Grilla (BBT), Chloe LaJeunesse (BBT), David Morgan (BBT)
Advisors: Elisabeth Stoddard, Laureen Elgert
Sponsor: John Stoddard, Higher Ground Farm

2:00pm
Designing a Bike Trailer for Sustainable Food Transportation
Richard Coffin (ME), Cameron Hastings (ME), Gregory Port (RBE), Karl Sundberg (ME)
Advisors: Laureen Elgert, Elisabeth Stoddard
Sponsor: John Stoddard, Higher Ground Farm

2:30pm
A User Study on Strong Authentication
Nathan Casco (CEE), Andrew Mokotoff (CS), Cuong Nguyen (CS), Romuald Valme ECE
Advisors: Alexander Smith, Thomas Eisenbarth (ECE)
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

The WPI 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 (MQP). If you are interested in discussing a possible sponsorship opportunity, 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 a “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 on the scope of the project and the disciplines of the student team—there may be additional advisors.

More information about sponsoring a project: wpi.edu/+engage

To contact a specific academic department, refer to the list below. 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
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 45 WPI project centers throughout the Americas, Africa, Asia-Pacific, and Europe.