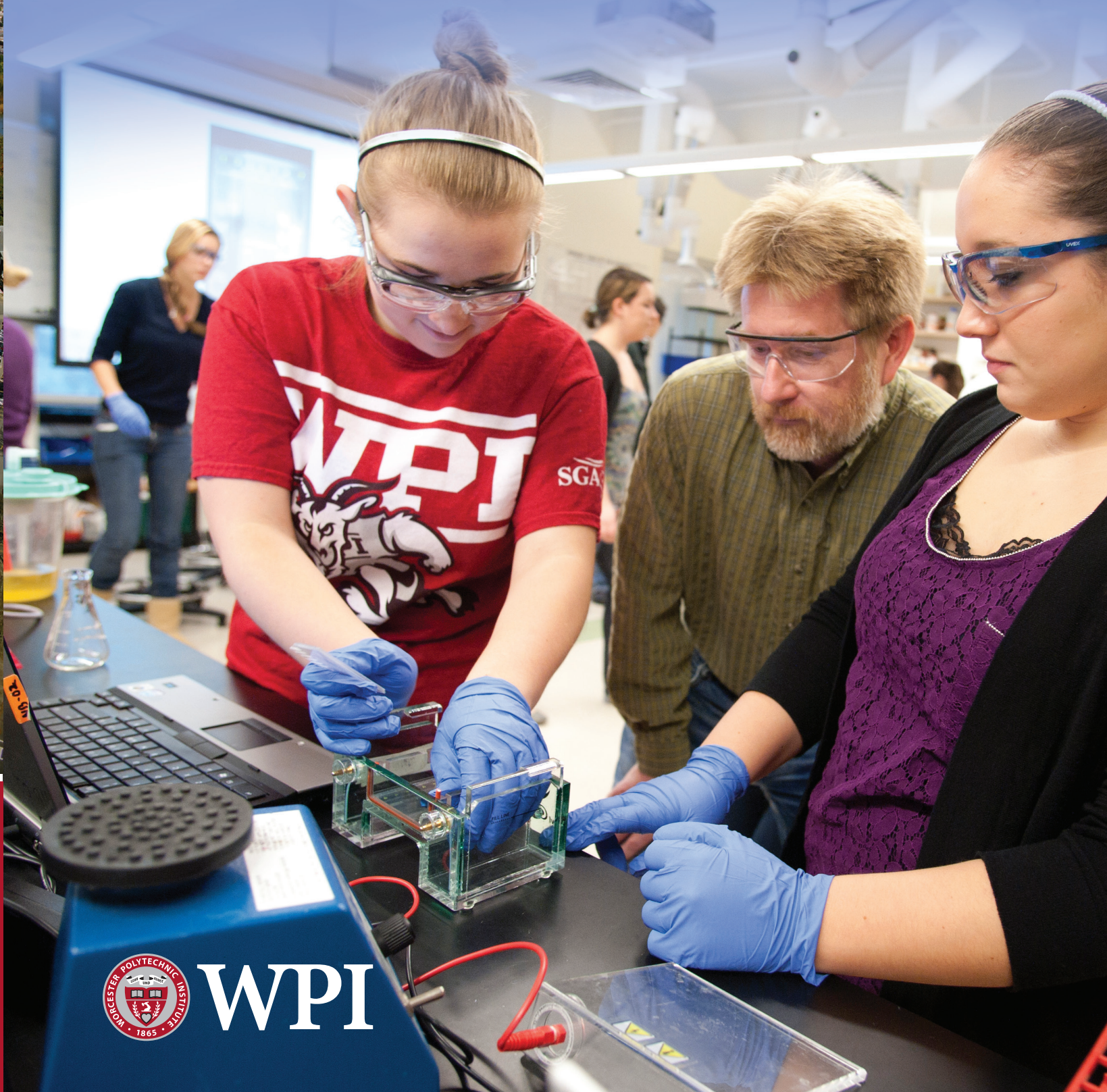


PROJECT PRESENTATION DAY

April 20, 2017



WPI

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"As a project center, MITRE provides WPI students with opportunities to make impacts working in the public interest. While this deep partnership provides us with more ideas, more talent, and some fresh thinking, the real-world experience prepares WPI graduates to come to MITRE ready to take on our sponsors' biggest challenges."

Peter Sherlock, '82, '86 MS

Senior Vice President and Director of Bedford Operations
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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

3 Aerospace Engineering	16 Environmental Engineering
3 Biology and Biotechnology	16 Humanities and Arts
5 Bioinformatics/Computational Biology	17 Interactive Media & Game Development
5 Biomedical Engineering	18 Mathematical Sciences
7 Business	19 Mechanical Engineering
8 Chemical Engineering	21 Physics
9 Chemistry and Biochemistry	22 Professional Writing
11 Civil and Environmental Engineering	23 Robotics Engineering
12 Computer Science	24 Social Science and Policy Studies
14 Electrical and Computer Engineering	

Project Presentation Day Schedule

Aerospace Engineering

Higgins Labs, Room 116

8:30am

Design and Testing of a Scale-Model Surface Undersea Kite (SUSK)

Austin Higgins, Peter Melander, James O'Hara, Mladen Pepic, Derek Porter

Advisors: David Olinger, Nancy Burnham (PH)

8:50am

Coordinated Quadrotor Unmanned Aerial Vehicles

Nicholas Green, Jonathan Griffin, Christopher Mastrangelo, Keith Rockwood, Aaron Vien

Advisor: Raghvendra Cowlagi

9:10am

Design of a Split Hopkinson Pressure Bar for Dynamic Testing of Materials

Bryan Adie, Kieran Cochrane, Anushrot Mohanty, Samuel Sierra

Advisor: Nikhil Karanjaokar

9:30am

Micro Aircraft Design

Miguel Almeida, George Asare, Alex Brown, Samantha Chernin, Michael DiMilia, Jamie Donahue, Thomas Hlavenka, Alexander Korza, Yutong Li

Advisor: Anthony Linn

Sponsor: AIAA Foundation

10:00am

Classroom Experiment in Longitudinal Stability and Control

Zachary Edelman, Victor Levorse, Brendan Sullivan, Zachary Wingerter

Advisors: Raghvendra Cowlagi, David Olinger

10:20am

Design and Analysis for the Sphinx-NG CubeSat (I)

Emily Curci, Jarrett Jacobson, Weston Schlack, Kelley Slabinski

Advisor: Nikolaos Gatsonis

10:40am

Design and Analysis of the Sphinx-NG CubeSat (II)

Jack Agolli, James Gadoury, Andrew Rathbun

Advisor: Michael Demetriou

11:00am

Design and Analysis of the Sphinx-NG CubeSat (III)

Dong Ko, Steven Laudage, Matthew Murphy, Daniel Pelgrift, Samuel Young

Advisor: John Blandino

11:20am

Plume Analysis and Detection

Eric Fast, Stephen Harnais, Ryan Wiesenberg

Advisors: Michael Demetriou, Nikolaos Gatsonis, Raghvendra Cowlagi (RBE)

Biology and Biotechnology

POSTER SESSION, 9:30am to 11:30am

Rubin Campus Center, Odeum

New Drugs for an Old Disease

Megan Barter, Christine McCarron

Advisors: Mike Buckholt, Scarlet Shell

Effects of Vegetation Structure and Composition on Grassland Bird Habitat Occupancy

Jennifer Bombard

Advisor: Marja Bakermans

Sponsors: Mass Audubon, Trustees of Reservations, Mass Division of Fisheries & Wildlife

Effects of BKCa Channel Activation and ROS Scavenging in Aging Vasculature

Mackenzi McHugh, Eric Borges

Advisor: Reeta Rao

Sponsor: Richard Clements, Brown University

Single-Base Editing of Cellular mRNA by CRISPR/Cas9

Andrew Baker, Kimberly Coddling

Advisors: Mike Buckholt, Natalie Farny

Investigating the role of Sec6 and RabE during polarized cell growth in *Physcomitrella patens*

Allison Butt

Advisor: Luis Vidali, Destin Heilman (CH)

Sponsor: Mary Munson, UMass

Characterization of Kekkon5

Chloe LaJeunesse

Advisor: Joe Duffy

Effects of Proteomic Digest Vonditions and sample contamination on Protein Quantitation in CSF and Plasma

Emma-Jane Turton

Advisor: Dave Adams

Sponsor: Sanofi Genzyme

Using the Auxin-Induced Degradation System to Dissect Factors within the Exocyst

Rachael Heard

Advisor: Jagan Srinivasan

Sponsor: Mary Munson, UMass

The Role of *C. albicans* Secreted Aspartyl Proteases (SAPs) in Phagocyte Recognition via Pathogen Recognition Receptors (PRRs)

Jeffrey Letourneau

Advisors: Reeta Rao

Lyme Disease and Indicators of Biodiversity

Alessandra Chiamonte, Catherine Souza

Advisors: Marja Bakermans

Small Animal Euthanasia

Evelyn Platko, Julia Holtzman

Advisor: Jill Rulfs

Sponsor: Alicia Karas, Tufts

Novel Antibiotic Isolation and Characterization from Soil Bacteria

Colin Harrington, Matthew Googins,

Parsant Jotikasthira

Advisors: Mike Buckholt

Determining the Role of Aurora A Kinase and Implications of its Inhibition in Acute Myeloid Leukemia

Eva Childers, Bernat Navarro Serer

Advisor: Amity Manning

Role of the 5' UTR in Expression of an Essential Heat Shock Protein in *M. smegmatis*

David Morgan

Advisor: Scarlet Shell

Regulation of Mitotic DNA Damage by the Retinoblastoma Tumor Suppressor Protein

Lindsay Gurska

Advisor: Amity Manning

Gene Therapy of Pompe Disease in a Mouse Model Using Viruses Encoding GAA

Samantha Bircsak

Advisor: Dave Adams

Sponsor: Dr. El Mallah, UMass

Effects of Genistein on Ovarian Cancer

Allison Fechtmann, Alena Grilla

Advisors: Jill Rulfs, Mike Buckholt

Gender-based Differences in ALS and Parkinson's disease expression in *C. elegans*

Rebecca Burns, Marissa Patterson, Aidan Burn

Advisors: Jagan Srinivasan, Jeanine Skorinko (HUA)

***Artemisia annua* and Its Effects on Cancer Proliferation**

Edward Dring, Sebastian Espinosa

Advisors: Jill Rulfs, Mike Buckholt

The Role of RUNX2 in Mixed Lineage Leukemia

April Solon

Advisors: Dave Adams

Sponsor: Lucio Castilla, UMass

To Stress or Not to Stress: Pesticides and Cellular Stress Response

Cecelia Cotter, Miranda Lawell

Advisors: Natalie Farny, Mike Buckholt

Characterizing Microglial Interactions with Cortical Neurons in the Development of the Healthy Brain

Frederick Gergits

Advisor: Natalie Farny

Sponsor: Dorothy Schafer, UMass

Examination of Chemosensation and Aversive Behaviors in *C. elegans*

Jaden Yabut

Advisor: Jagan Srinivasan

Are THP-1 Derived Macrophages a Comparable Model System for Primary Human Dendritic Cells?

Rachel Brown

Advisor: Elizabeth Ryder

Sponsor: Manuel Garber, UMass

Characterization of Chromosomal Mutations of Human Embryonic Stem Cell That Fail to Differentiate

Arba Karcini

Advisor: Tanja Dominko

Assessing Artemisinin's Treatment Viability in MCF7 Cells

Whitney Hazard, Rebecca German, Reed Maxim

Advisors: Jill Rulfs, Mike Buckholt

Effects of Stress on Levels of RNA Degradation Proteins in *Mycobacterium smegmatis*

Charlotte Reames

Advisor: Scarlet Shell

Development of Engineered Bacteria for Agglutination-based Dengue Detection

Shelby McQueston, Niamh Fennessy,

Hannah Thompson

Advisors: Natalie Farny, Mike Buckholt

Habitat Management for Grassland Birds at Westover Air Reserve Base

Brian Amato

Advisor: Marja Bakermans

Sponsors: Mass Division of Fisheries & Wildlife, Westover Air Reserve Base

Replication Timing in the Yeast Species *Saccharomyces cerevisiae*

Anna Wortman

Advisor: Reeta Rao

Sponsor: Nick Rhinde, UMass

Post-Transcriptional Regulation of Maternal mRNAs in the *C. elegans* Germline and Early Embryogenesis

Zahra Khazal

Advisor: Jagan Srinivasan

Sponsor: Sean Ryder, UMass

Bacillus subtilis* as a Probiotic: Implications for Inflammatory Bowel Disease and Intestinal Colonization of *Candida Albicans

Meredith Rioux

Advisor: Reeta Rao

Bioinformatics and Computational Biology

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

Are THP-1 Derived Macrophages a Comparable Model System for Primary Human Dendritic Cells?

Rachel Brown

Advisor: Elizabeth Ryder

Sponsor: Manuel Garber, UMass

Biomedical Engineering

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

9:10am

Equine Lung Function Testing Device

Lucy Garvey, Lubna Hassan,

Kyla Nichols, Allison Paquin

Advisors: Marsha Rolle, Melissa Mazan (Tufts), Robert Daniello (ME)

9:30am

VitaCream: A Cosmetic Skin Cream to Revolutionize Skincare

Peyton Delgorio, Drew DeRubeis, Conrad Ruiz

Advisors: Glenn Gaudette, Kristen Billiar

9:50am

Electrospun Tissue Engineering Scaffold

Michelle Bleau, Hasson Shakor Harris Wilcher, Benjamin Heney, Zachary Simpson

Advisors: Sakthikumar Ambady, Amy Peterson (CHE)

10:10am

Design of a Universal Microscope Incubator for Drug Screening of 3D Models of Engineered Myocardium

Rachel Connolly, Marianne Kanellias, Heather Stratica

Advisors: George Pins, John Sullivan (ME)

10:40am

Automated Uniaxial Tension System for Mechanically Active Tissue Culture

Thomas Flannery, Gregory Molica, Kate Rielly, Nathan Rumpf

Advisors: Glenn Gaudette, Songbai Ji

11:00am

Obstetric Cervical Ripening Device

Katie Brochu, Taylor Flaxington, Jocelyn Kurtze

Advisors: Marsha Rolle, Ryan Callery (UMass)

11:20am

Developing a Method for Characterizing Mechanotransduction in Cell Clusters: Stretching Substrates with Alterable Stiffness

Emily Caron, Rhiannon Goddard, Sydney Gustafson, Samantha Orosz

Advisor: Kristen Billiar

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

9:10am

Engineered Connective Tissue Scar Model for Regenerative Medicine Applications

Daniela Barbary, Hanne Richardson, Fernando Salazar

Advisors: Raymond Page, Tanja Dominko (BBT)

9:30am

Hydrogel Microfluidic System to Control Oxygen Gradients for Breast Cancer Cells

Franklin Alvarez, Michelle Henderson

Advisor: Dirk Albrecht

9:50am

Design of a Prosthesis for Canines with Front Limb Deformities

Mushtaq Al Zuhairi, Norma Bachman, Melanie Lasso, Oluwajomiloju Olaode, Elizabeth Walfield

Advisors: Karen Troy, Tiffiny Butler

10:10am

Point of Care Testing for Kidney Hemodialysis

Sean Fallon, Erin LaBounty,
Brianna Parent, Sarah Rogers
Advisor: Mustapha Fofana (ME)

10:40am

Pressure Ulcer Prevention Patch System

Rachel Ooyama-Searls, Brittney Pachucki,
Benjamin Parent
Advisor: Yitzhak Mendelson

11:00am

**Seed Train Development for Vero Cells
in the XDR-200**

Nicholas Dalton, Charles Hill, Elie Karam,
Colin Larsson, Zachary McKinzie
Advisors: Zoe Reidinger, Kamal Rashid (BBT),
Patrick Guertin (GE), Hao Zhang (GE),
Yasser Kehail (GE), Chris Dunn (GE)

11:20am

**MagneForce: A Modular Tri-Axial Force Sensor
for Gait Analysis**

Brandon Lam (ME), David Laovoravit (RBE),
Nathan Stomberg
Advisors: Karen Troy, Cagdas Onal (ME)

11:40am

**Cold Chain Device Viability for UAS Delivered
Medical Supplies**

Michael Beinor (ME), Evan Bosia (ME),
Scott Cazier, Keegan Train (ME)
Advisors: Jianyu Liang (ME),
Gregory Fischer (ME)

**SESSION III: 9:00am to Noon
Salisbury Labs, Room 105**

9:10am

Low Cost Malaria Detection

Benjamin Grondin, Benjamin Hassett,
Taryn Loomis
Advisor: Zoe Reidinger

9:30am

A Fastening Device for Rotator Cuff Repair

Alexandra Czamara, Anne McLoughlin,
Kyra McNamara, Lindsay Schneider
Advisors: Sakthikumar Ambady,
Robert Meislin (NYU)

9:50am

Accurate Prosthetic Hand

Casey Kracinovich (RBE), Mervyn Larrier,
Dylan Renshaw, Elina Saint Elme (ME)
Advisors: Karen Troy, Marko Popovic (PH)

10:10am

**Realistic Simulated Organs for
Ultrasound Guided Procedures**

Mikayla Bolduc, Briana Rodriguez
Advisors: Kwonmoo Lee, Sawart Hussain
(UMass)

10:40am

**Developing a Multiplexing Assay System for the
Quality Control of Cell Therapy Products**

Julia Smith, Thai Trinh, Amishi Vairagade
Advisors: Kristen Billiar, Edward Clancy (ECE)

11:00am

**High-Throughput Maturation of Tissue-
Engineered Skeletal Muscle Constructs**

Benjamin Cossette, Annabella Goncalves,
Alexander Marry, Mina William
Advisor: Raymond Page

11:20am

**A Reflectance Sensor Holder for PPG
Measurements from the Chest**

Tori Claverie, Cobi Finkelstein, Nicholas McNary
Advisor: Yitzhak Mendelson

**SESSION IV: 9:00am to Noon
Salisbury Labs, Room 406**

9:10am

**Design of a Non-Invasive Device to Measure
Bone Strength Recovery of Distal Radius
Fractures for Use with HR-pQCT Imaging**

Jennifer Golden, Ahmed Hakim, Hannah Sattler
Advisors: Karen Troy, Ara Nazarian (Harvard)

9:30am

**Neuromodulation by Mechanical Strain
in *C. elegans***

Benjamin Duncan, Jacob Maalouf,
Alexander Noonan, Tristan Petit,
Advisors: Dirk Albrecht, Songbai Ji

9:50am

**Designing a Viral Reduction System for
FDA Approval in Fibrin Sutures**

Brian D'Amore, Emily Ferreira,
Erin McConnaghy
Advisors: Glenn Gaudette, Jeannine Coburn

10:10am

**Novel Adaptive Gripping Device for
Fine Motor Control**

Sarah Bucknam, Caitlin Grow
Advisors: Kwonmoo Lee,
Pradeep Radhakrishnan (ME)

10:40am

Composite Fibrin Scaffold for Skeletal Muscle Regeneration

Alexandra Burr, Anthony Campagna (CHE),
Janine Fatal, James Lin, Elizabeth Van Zyl
Advisors: George Pins, Jeannine Coburn

11:00am

Expandable Blades for Precision Veterinary Myringotomy

Kaitlin Beach (ME), Jack Blanchard,
Michael Clark (ME), Nicole Quintal,
Connor Tower
Advisors: Kristen Billiar, Andrea Lam (Tufts),
Christine Zewe (Tufts)

11:20am

A Surgical Fastener to Prevent Type I Retears in Rotator Cuff Repair Surgeries

Nicholas Brocato, Kristin Gallagher,
Gabriela Meza, Emily Viloudaki
Advisors: Sakthikumar Ambady,
Robert Meislin (NYU)

Business

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

A Business Plan to Implement Procedures and Operations of Snail Farming for Higher Ground Farm

Travis Clark, Zulean Cruz-Diaz,
Hannah Navarro, Alyssa Perry
Advisors: Michael Elmes, Karla Mendoza Abarca
Sponsor: John Stoddard

Active Trading in the Renewable Energy Sector: A Performance Evaluation

Aristotelis Papadopoulos
Advisor: Dimitrios Koutmos

Barclays QA Automated GUI Testing Migration Analysis

Didi Dai, Jonathan Ho Wu
Advisors: Xinming Huang (EE), Renata Konrad,
Kevin Sweeney
Sponsor: Barclays PLC

BNP Paribas: Budget Automation

Jacqueline Ngo, Nan Zhang
Advisors: Michael Ciaraldi (CS), Renata Konrad,
Kevin Sweeney
Sponsor: Andrew Clark

Business Optimization for the Formula SAE Club

David Powers
Advisors: David Planchard (ME), Kevin Sweeney
Sponsor: WPI Formula SAE Team

Campus Event Finder Application

Tyler Bennett, Zahr Lyttle, Brandon Malofsky,
Matthew McCarthy, John Ross
Advisors: Diane Strong, Wilson Wong (CS)

Commercialization Strategy for Solar Technology

Jahan Dadlani, Luis Garcia,
Marcus Middleton, Pabitra Saikee
Advisor: Frank Hoy

Current State Analysis and Long-Term Recommendations for Employee Diabetes Management

John Mastroianni, John Perry,
Gretchen Siewert, Mona Yuan
Advisor: Sharon Johnson
Sponsor: UMass Memorial Health Care

Design and Analysis of Cognitive Focus Devices

Brianna Fogal, Connor McGrath,
Carolina Ramos, Ashley Stanley, Daniel Sturman
Advisors: Bland Addison (HU),
Torbjorn Bergstrom (ME), Walter Towner,
Helen Vassallo

Developing a Marketing Plan for The Christian Science Monitor

Sean Doncaster, Jason Lamb, Brian Murtagh
Advisors: Karla Mendoza Abarca, Purvi Shah
Sponsor: The Christian Science Monitor

Development of a Decision Support App for Perinatal Depression

Nicolas Adami-Sampson, Trivani Shahi,
Nicholas Shannon, Leif Waugh, Drew Wethern
Advisor: Bengisu Tulu
Sponsors: Kathleen Biebel, Nancy Byatt,
Tiffany Moore-Simas

Enhancing Mindfulness-Based Stress Reduction Through a Mobile Application

Richard Falzone, Andrew Mahn,
Nicholas Pataky, Juan Rodriguez
Advisor: Eleanor Loiacono
Sponsor: UMass Medical School

Ice Hockey Coaching Device Design, Marketing, and Feasibility Analysis

Conor Crowley, Robert McGuire
Advisors: Torbjorn Bergstrom (ME),
Walter Towner, Helen Vassallo

Implementing Lean Solutions at the Front Desk of Hahnemann Family Health Center

Mark DeVries, Emily Martin,
Stephen Reilly, Ashley Valdez
Advisor: Sharon Johnson
Sponsor: UMass Hahnemann Family
Health Center

Improving Manual and Automated Text Simplification

Kyle Hudgins, Serra Onder,
Rong Tang, Ziyu Zhou
Advisor: Soussan Djamasbi
Sponsors: IBM Accessibility Research,
UMass Boston, UMass Medical School

Improving Student Placement in IQP Centers via Preference Matching

Camila Dias, Lin Jiang, Elizabeth Karpinski
Advisor: Andrew Trapp
Sponsor: Interdisciplinary and Global Studies
Division (IGSD)

Lean Process Improvement at Mack Molding

Jane Bingel, Allison Buckley, Tyler Kilkenny,
Casey Magrath, Justice Williams
Advisors: Walter Towner, Helen Vassallo
Sponsor: Mack Molding

Lean Process Improvement at the Boylston Fire Department

Maria Lockette
Advisors: Walter Towner, Helen Vassallo
Sponsor: Boylston Fire Department

Oil Market Analysis for Teal

Nicholaus Jasinski, Akshay Rao, Sarah Terwilliger
Advisors: Alexander Smith (SSPS), Kevin
Sweeney, Amy Zeng
Sponsor: Andrew Aberdale

Operator Touch Time Analysis at Skyworks Solutions Inc.

Marissa San Andres, Jose Spiegel,
Luis Vargas, Andres Vega
Advisors: Walter Towner, Helen Vassallo
Sponsor: Skyworks Inc.

Pressure Ulcer Prevention System

Amanda Agdeppa, Syed Ali Hussain,
Hyunsoo Kim, Victoria Loehle
Advisors: Shamsur Mazumder (EE), John McNeill
(EE), Walter Towner, Helen Vassallo

Primetals Process Improvement

Emily Aldrich, Elizabeth Bernier, Serra Onder,
Molly Rockwood, Jonathan Viens
Advisors: Torbjorn Bergstrom (ME),
Walter Towner, Helen Vassallo
Sponsor: Primetals Technologies

ProtoFoisie: Prototyping the Usage of the Foisie Innovation Studio

Morgan Mitchell
Advisors: Curtis Abel (UG), Michael Ginzberg,
Arthur Heinricher (MA)

Rheometer Market Analysis

Andrew Burgoyne, Lucas Muntz
Advisors: Kristen Billiar (BME), Frank Hoy

Work Hero

Ryan Leaf, Tim Marshall
Advisor: Soussan Djamasbi
Sponsor: User Experience and Decision Making
Lab, WPI

Chemical Engineering

POSTER SESSION, 9am to Noon Salisbury Labs, Room 402

Bioalcohol Extraction Using Super Critical Carbon Dioxide

Cameron DiSpirito, Eric Stolz
Advisor: Michael Timko

LL37 Antimicrobial Peptide

Yoon Lee, Rachel Smith
Advisor: Terri Camesano

Tailored Synthesis of Bi₂S₃ Thin Film to Enhance Optoelectronic Performance

Zhehao Zhu
Advisors: Drew Brodeur (CBC), Aaron Deskins,
Pratap Rao (ME)

Recharge Ability of a Liquid Metal-Air Battery

Allison Marx, Kelly Rapoza
Advisor: Ravindra Datta

Synthesis of CsSnBr₃ Bulk Crystals and Study of its Lewis Basicity

Weiran Gao
Advisor: Ron Grimm (CBC)

Transport Proteins for Taxol

Mariana Harley, Huilin Yang
Advisor: Sue Roberts

Design of Small-Scale Furnace for Fire Resistance Testing of Building Construction Materials

Joseph Igoe (ME), Alexander Ing,
Kevin Lynch (ME), Dylan Martel (CEE),
Lynn Renner, Tara Sharp (ME),
Austin Smith (ME), Steve Thulin (CEE)
Advisor: Nick Dembsey (FPE)

Identification of Organometallic Complexes in Agro-mining Extract

Debora Lopes, Gisele Trivino (EVE)

Advisor: Steve Kmiotek

Sponsor: ENSIC (Ecole Nationale Supérieure des Industries Chimiques)

Evaluating Low-Cost Catalysts for Biodiesel Production

Daniel, Bloemker, Marguerite Caray,

James Commisso, Daniel Mortimer,

Anya Prevallet-Kinstle

Advisor: William Clark

Pilot Testing of Self-Healing Coatings on Structural Concrete

Sebastien Deveau, Max Foster, Logan Nichols,

Anna Schab (CEE)

Advisors: Amy Peterson, Aaron Sakulich (CEE)

Process Safety Review of Butanol Extraction

Shannon Healey, Luke Jackson

Advisors: Steve Kmiotek, Mike Timko

Recovery of Metal Catalyst

Elena Conroy, Jessica Lord, Omar Olortegui

Advisors: William Clark, Steve Kmiotek

Sponsor: Sunovion

Electrospun Tissue Engineering Scaffold

Michelle Bleau (BME), Hasson Harris-Wilcher

(BME), Ben Haney, Zach Simpson (BME)

Advisors: Shakti Ambady (BME), Amy Peterson

**POSTER SESSION, 8:30 to 10:30am
Salisbury Labs, Room 411**

Testing the Stability of Cation Exchanged Zeolite ZSM-5 in Hot Liquid Water

Jared Danaher, Caroline Medino,

Hope Shevchuck, Mandy Zhang

Advisor: Mike Timko

Metal Cation Adsorption by Hydrothermal Chars and Lignins

John Hobson, Michael Levy

Advisors: Avery Brown, Mike Timko

Radiation Models for Fixed Beds

Nathan Caso

Advisor: Anthony Dixon

Novel Methods for Extracting Plant Metabolites from Culture Broth Using Polymer Printing

Clydebaise Niba, Matthew Portugal, Benjamin

Small, Shawn Wile

Advisor: Sue Roberts

Development of a Plant Cell Culture Platform for Recombinant Protein Expression

Ryanne Dailey

Advisor: Sue Roberts

Energy Analysis of Butanol Extraction Using Supercritical CO₂

Audrey Allen, Sarah Muse

Advisor: Mike Timko

Glucose Hydrothermal Chars: Surface Chemistry and Heavy Metal Adsorption

Abhinav Adhikari, Shaelyn Quinn

Advisor: Michael Timko

Methanol Electrolysis to Produce Hydrogen

Brian Praetorius

Advisor: Ravindra Datta

Triple-Layer Hydrophilic-Hydrophobic Composite Membrane for Desalination Using Direct-Contact Membrane Distillation

Ryan Dennis

Advisors: David DiBiasio, Steve Kmiotek,

Susan Zhou

Sponsor: Shanghai Jiao Tong University

Techniques for Modeling and Scaling Liquid-Phase Mixing in Mechanically Agitated Vessels

Sean Deans, Marty Fitzgerald

Advisors: William Clark, Steve Kmiotek

Sponsor: Sunovion Pharmaceuticals

Solid Acids for Biomass

Zachary Burgess, Luke Habib

Advisors: Aaron Deskins, Mike Timko

Smart P & IDS

Alexander Gikas, Anthony Kassas

Advisor: Steve Kmiotek

Sponsor: DPS Engineering

Measurement of Current Distributions in PEM Fuel Cells

Alicia Aquino, Joseph Heng

Advisor: Steve Kmiotek

Sponsor: Francois Lapicque, ENSIC (Ecole Nationale Supérieure des Industries Chimique)

Chemistry and Biochemistry

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

Investigation of the Propensity for Self-association of the N-terminal Domain of Annexin A2 in the Presence of Anionic Lipids

Abigail Cornwell

Advisor: Arne Gericke

The Investigation of Srf-6 and Nsy-1 in *C. Elegans*

Alexander Hu

Advisor: Samuel Politz (BB)

Investigating the Effects of Vps45 Mutations Associated with Severe Congenital Neutropenia on SNARE Interactions

Alexandra D'Ordine

Advisors: Destin Heilman,
Mary Munson (UMMS)

Sponsors: UMMS, WPI

Investigating the Role of Sec6 and RabE During Polarized Cell Growth in *Physomitrella patens*

Allison Butt

Advisors: Destin Heilman, Luis Vidali (BB)

Sponsor: Mary Munson, UMMS

Investigating a Novel Copper Storage Protein in *Pseudomonas aeruginosa*

Andrew Baez

Advisor: José Argüello

Single-Base Editing of Cellular mRNA by CRISPR/Cas9

Andrew Baker, Kimberly Coddling

Advisors: Michael Buckholt (BBT),
Natalie Farny (BBT)

Calcium Signals in A10 Cells

Androniqi Qifti

Advisor: Suzanne Scarlata

The Role of RUNX2 in Mixed Lineage Leukemia

April Solon

Advisors: Dave Adams (BBT),
Lucio Castilla (UMMS)

Sponsor: UMMS

To Stress or Not To Stress: Pesticides and Cellular Stress Reponse

Cecilia Cotter, Miranda Lawell

Advisors: Natalie Farny (BBT),
Michael Buckholt (BBT)

Determining the Role of Aurora A Kinase and Implications of its Inhibition in Acute Myeloid Leukemia

Eva Childers, Bernat Navarro Serer

Advisors: Amity Manning (BBT), Destin Heilman

Low-Temperature Electrolysis of Mixed Metal Oxides

Everett Baker, Shaun Bonefas, Brittany Kyer,
Christian Morneau

Advisors: Yan Wang (ME), Shawn Burdette

Synthesis and Evaluation of New HIV-1 Protease Inhibitors

Jessica Falci

Advisors: James Dittami,
Akbar Ali (UMMS)

Sponsor: UMMS

Selective Elimination of Microglia via Cre-Recombinase

Kyle A Bessette

Advisors: Arne Gericke, Dori Schafer (UMass Medical School), Kasey Johnson (UMMS)

The CRISPR Enzyme Cpf1 as a Tool for Gene Regulation

Kyle Morrison

Advisors: Destin Heilman,
Scot Wolfe (UMMS)

Photoelectrochemical Voltage vs Back-Contact Barrier Heights

Margaret Ann Russell

Advisor: Ronald Grimm

Novel Antibiotic Isolation and Characterization from Soil Bacteria

Matthew Googins, Colin Harrington,
Parsant Jotikasthira

Advisor: Michael Buckholt (BBT)

Development of Engineered Bacteria for Agglutination-based Dengue Detection

Niamh Fennessy, Shelby McQueston,
Hannah Thompson

Advisors: Michael Buckholt (BBT),
Natalie Farny (BBT)

Copper-Catalyzed Weak C-H Bond Amination

Nicholas Venditto

Advisor: Marion Emmert

Determining the Origin of Fe³⁺-induced BOD-IPY Probe Fluorescence in Aqueous Solution

Paige Lamica

Advisor: Shawn Burdette

Characterizing Functions of Porcine Circovirus Type 1 Viral Protein 3

Paul Burrowes, Christine Carbone

Advisor: Destin Heilman

MRI and Optical Imaging Contrast Agent

Sarah Fields

Advisor: Drew Brodeur, Gang Han (UMMS)

Sponsor: UMMS

Aneurysm Simulation and ELISA Detection in Rabbits

Stephanie Puckett, Anna Schozer

Advisor: Drew Brodeur

Sponsor: Alexei Bogdanov, University of Massachusetts Medical School, Radiology

Investigation of Bulky Carboxylic Acids and Amines as Trapping Agents for Controlling Desorption of Molecular Guests from a Porous Metal-Organic Framework

U Shwe Thein

Advisor: John MacDonald

The Role of Phosphatidylserine as a Scaffold for Lipid/Protein Complexes

Vanesa Pinderi

Advisor: Arne Gericke

Synthesis and Kinetic Analysis of HCV NS3/4a Protease Inhibitors

Wasih Kamran

Advisors: Destin Heilman, Akbar Ali (UMMS)

Sponsor: UMMS

The Role Mitochondria Play in Neuronal Cell Differentiation

Whitney Davis

Advisor: Suzanne Scarlata

Tailored Synthesis of Bi₂S₃ Thin Film to Enhance Optoelectronic Performance

Zhehao Zhu

Advisors: Pratap Rao (ME), Aaron Deskins (CHE), Drew Brodeur

Civil Engineering

POSTER SESSIONS, 1:15 to 3:30pm

**AE majors ** FPE majors*

Kaven Hall, 1st Floor Hallway

An Alternative Design of the Foisie Innovation Studio and Messenger Residence Hall with Podium Construction

Dylan Roche*, Bruno Scherrer*

Advisors: Leonard Albano,

Soroush Farzinmoghadam

An Alternative Envelope Design for Boston Children's Hospital Garage

Naumilda Como*

Advisor: Steven Van Dessel

Sponsor: Stantec Inc.

Boston Children's Hospital Construction Management Plan

Tyler Leighton, Kenuel Lopez Rivera,

Tyler Van Nostrand (EVE), Kevin Wormer

Advisor: Suzanne LePage

Sponsor: Stantec Inc.

Design of an Architectural Engineering Department Building for Worcester Polytechnic Institute

Meghan Hickey*, Kimberly Marrion*,

Cassandra Tomerlin*, Marc Toomajian*

Advisors: Leonard Albano, Kenneth Elovitz,

Leffi Cewe-Malloy, Soroush Farzinmoghadam

Development of an Auxetic Material for Construction

Christopher Zmuda

Advisor: Nima Rahbar

Evaluation of a Solar Water Heating System for Zero Energy Design

Ysabel Espinal*, Ismael Nowick*, Leanne Sickles*

Advisor: Steven Van Dessel

Fire Performance of Glass Curtain Walls

Joycelyn De La Rosa*, Yijie Lu*

Advisor: Steven Van Dessel

Green Design Alternatives for New Water Treatment Plants in Parker, Colorado

Geneva Cabral, Miguel Escuer Velasquez,

Robyn Quartararo, Ahsan Aadil Nizam Shaikh

Advisors: Leonard Albano, Suzanne LePage

Sponsor: Stantec Inc.

Hubbardston Complete Streets Design

Alexander Bosworth, Sarah Campos

Advisor: Suzanne LePage

Sponsor: Town of Hubbardston

Integrated Structural and Fire Protection Considerations in Building Design

Elizabeth Coffey, Emma Healey

Advisor: Leonard Albano

Investigation of the Thermal Properties of Rice Husk Ash in Cement

Brendan Johnson, Serena Soltero,

Daniel Stomski, Abbey Teliska

Advisor: Aaron Sakulich

Mass Timber in Tall Building Design

Michael Fager-Thompson, Emanuela Sherifi

Advisor: Nima Rahbar

Kaven Hall, 116

Design of a Small-Scale Furnace for Fire Resistance Testing of Building Construction Materials

Joseph Igoe**, Kevin Lynch**,

Dylan Martel**, Steve Thulin**

Advisor: Nicholas Dembsey

Materials Fire and Thermal Properties — Low E Windows

Garrett Curran**, Perry Ascani**,

Sai Paing**, Madelyn Werth**

Advisor: Nicholas Dembsey

North Lake Ave Bridge Design

Ryan Cavanaugh, John Connors,

Jibreel Mustafa, Ryan Sullivan

Advisors: Leonard Albano, Mingjiang Tao

Pedestrian Bridge Design and Institute Park Improvements

Emily Raskett, Brittany Rebello

Advisor: Leonard Albano

Pilot Testing of Self-Healing Coatings in Structural Concrete

Deveau Sebastien (CM), Maxwell Foster (CM), Logan Nichols (CM), Anna Schab

Advisors: Amy Peterson (CM), Aaron Sakulich

The Role of BIM in a Collaborative Approach for Design and Construction at the Foisie Innovation Studio

Christan Dorskocil, Michael Vaitkunas

Advisor: Guillermo Salazar

Sponsor: Shawmut Design & Construction

Structural Bridge Design and Construction Traffic Management Plan for the Route 24/140 Interchange (28)

Anjali Kuchibhatla, Carolina Leguizamón, Maitane Sesma

Advisors: Leonard Albano, Suzanne LePage

Sponsor: Stantec Inc.

Kaven Hall 204

Responding to Challenges Following the Panama Canal Expansion Project: Analysis of Chemical Consumption Patterns at Miraflores Filtration Plant

Liliana Almonte, Sonia Zarate

Advisor: Aaron Sakulich

Sponsor: Autoridad del Canal de Panama (ACP)

Responding to Challenges following the Panama Canal Expansion Project: Evaluation of the ACP's Formal Inspection Program of Dams and Spillways

Caitlin Burner

Advisor: Aaron Sakulich

Sponsor: Autoridad del Canal de Panama (ACP)

Responding to Challenges following the Panama Canal Expansion Project: Process Analysis of Mount Hope Water Filtration Plant

Julia Ring

Advisor: Aaron Sakulich

Sponsor: Autoridad del Canal de Panama (ACP)

Responding to Challenges following the Panama Canal Expansion Project: Risk Analysis of Madden Dam and Spillway Drum Gates

Victoria Simpson

Advisor: Aaron Sakulich

Sponsor: Autoridad del Canal de Panama (ACP)

Computer Science

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

Using Image Recognition Technology as a Gameplay Mechanic

Thomas Meehan, Yahel Nachum, Andrew Ray

Advisors: Brian Moriarty (IMGD), Charles Rich

AlcoWatch

Andrew McAfee, Jacob Watson, Benjamin Bianchi

Advisor: Emmanuel Agu

Benchmarking Big Data Cloud-Based Infrastructures

Kurt Bugbee, Jeff Chaves, Dan Seaman

Advisor: Mohamed Eltabakh

Cyber Security Network Anomaly Detection and Visualization

Heric Flores Huerta, Jacob Link, Cassidy Litch

Advisors: Lane Harrison, Randy Paffenroth (MA)

Cypress Exergame Enjoyment

Joshua Audibert, Elijah Gonzalez,

Ryan Orlando, Nicholas Wong

Advisors: Emmanuel Agu, Mark Claypool

Data Analytics Models and Pipeline Development for Anomaly Detection

Ziyan Ding, Erin Esco,

Alexander Huot, Yihong Zhou

Advisors: Eugene Eberbach (RBE), Elke

Rundensteiner, Jian (Frank) Zou (MA)

Sponsor: ACI Worldwide

Designing and Simulating a Nuclear Reactor in Fortran

Sultan Jilani, Ivan Melnikov

Advisors: David Medich, Craig Wills

Detecting Solution Structures in Plan Composition Problems

Ben McMorran

Advisor: Kathi Fisler

Detruncation of Attenuation Maps Using Neural Networks

Daniel Beckwith, Aditya Nivarthi,

Akshay Thejaswi

Advisors: Emmanuel Agu, Clifford Lindsay

Sponsor: UMMS

Disease Tracking EHR for Medical Facilities in Ghana

Ebenezer Ampiah, Alexander Kasparek,

Dominik Smreczak

Advisor: Wilson Wong

Find and Assign

Christian Roberts

Advisors: Neil Heffernan, Cristina Heffernan

Hira Hero: Learning Hiragana Fluency Through Gameplay

Yuheng Huo, Jesse Marciano, Adam Myers

Advisors: Jennifer deWinter (IMGD), Charles Rich

Sponsor: Osaka University

Project Center: Japan Project Center

Intelligent Visualization of Holographic Biological Network Using HoloLens

Vakhtang Margvelashvili, Jonathan Sawin, William Van Rensselaer

Advisor: Dmitry Korkin

Design and Authorship for the Halberd Narrative Planning Engine

Richard Hayes, Myles Karam, Jonas McGowan-Martin, Brian Rubenstein, Gareth Solbeck

Advisors: Mark Claypool, Charles Rich

Performing Transaction Synthesis through Machine Learning Models

Justin Charron, Li Li, Yudi Wang, Shihao Xia

Advisors: Elke Rundensteiner, Yanhua Li

Sponsor: ACI Worldwide

Predicting Ischemic Stroke Recovery with Data Mining

Theresa Inzerillo, Preston Mueller

Advisors: Sergio Alvarez (Boston College), Carolina Ruiz

Synthesizing Mobile Games with Combinators

Joseph Blackman, Dean Kiourtsis, Bailey Sheridan

Advisor: George Heineman

The Conduit's Garden

Alex Guerra, John Nelson, Paul Orvis

Advisors: Jennifer deWinter (IMGD), Charles Rich

Sponsor: Takemura Labs at Osaka University

Project Center: Japan Project Center

Visualizing Contextual Information for Network Vulnerability Management

Andrew Mokotoff, Zachary Robbins, Barrett Wolfson

Advisor: Lane Harrison

Windows GUI Context Extraction

Austin Rose

Advisor: Craig Shue

**POSTER SESSION, 1:00 to 3:00pm
Fuller Labs, 3rd Floor Hallway
and Classrooms****5 Axis 3D Printing**

Ethan Coeytaux, Cameron Crook, Alexandre Pauwels, Hugh Whelan

Advisors: Diran Apelian (ME), George Heineman, Craig Putnam (RBE), Gabor Sarkozy

Adaptive Bitrate Streaming and Cloud Gaming

Robyn Domanico, Matthew Suarez, Lambert Wang

Advisor: Mark Claypool

Alco-Contextualizer

Rupak Lamsal, Matthew Nguyen, Jules Voltaire

Advisor: Emmanuel Agu

Application of Data Analytics to Cyber Forensic Data

Yao Chow

Advisors: George Heineman, Randy Paffenroth (MA)

Project Center: MITRE

Augmented DIAMOnD: A Method for Improving Disease Networks Among Human Genes

Kevin Specht

Advisors: Dmitry Korkin, Zheyang Wu (MA)

Autonomous Cargo Aircraft Project

Erik Nadel, Tyler Nickerson, Nicholas Bradford

Advisors: Michael Ciaraldi, Fred Looft (ECE)

BNP Paribas: Budget Automation

Nan Zhang

Advisor: Michael Ciaraldi

Sponsor: BNP Paribas

Project Center: Wall Street Project Center

Citizen Science Bee Ecology

Jackson Oliva

Advisors: Robert Gegear (BBT), Carolina Ruiz, Elizabeth Ryder (BBT)

Cloud-Based Infrastructure for Educational Deep Learning

Nicholas Diaz, Cameron Jones

Advisor: Neil Heffernan

Continuous Behavioral Mobile Authentication

Arun Donti, Arthur Dooner, Walter Ho, Stephen Lafortune

Advisor: Emmanuel Agu

Deep Learning for Intelligent Transportation

Mengwen Li, Javier Menchaca

Advisors: Xinming Huang (ECE), Emmanuel Agu

Developing Behavioral Interventions and Visual Intervention Displays for a Mobile Health Application

Michael Harney, Qiaoyu Liao
Advisors: Bengisu Tulu (FBS), Carolina Ruiz

EyeSite: A Framework for Browser-Based Eye Tracking Studies

William Hartman, Clark Jacobsohn
Advisor: Lane Harrison

Face Analytics Web Platform

Rayan Alsoby, Gordon Gao, Julie Valim
Advisors: Mark Claypool, Jacob Whitehill

Forex Trading Toolkit

Jason McKinney, Andrew Tautkus
Advisors: Hossein Hakim (ECE), Xiangnan Kong

Quantum Algorithms from a Linear Algebra Perspective

Lauren Baker, Liam Ogren
Advisors: William Martin (MA),
P. K. Aravind (PH)

Passive Biometric Authentication via Head Mounted Display

Joshua Hebert, Sai Vadlamudi, Jesse Earisman
Advisor: Krishna Venkatasubramanian

Peer Review in Cybersecurity Education

William Temple
Advisor: Kathryn Fisler

Reinventing Bomblab

Logan Brown, Gavin Hayes
Advisor: Hugh Lauer

Sailbot: Autonomous Robotic Sailboat

Nicholas Gigliotti, James Kuszmaul,
Tucker Martin, Ryan Wall
Advisors: William Michalson (RBE),
Kenneth Stafford (RBE)

Swarm Robotics

Nathaniel Jefferson, Peter Raspe, Nam Tran Ngoc
Advisor: Michael Ciaraldi

Visualizing Brain Network CNNs

Ryan Killea, Miya Gaskell, Ezra Davis
Advisor: Xiangnan Kong

Electrical and Computer Engineering

Atwater Kent Labs, Room 219

10:00am

AK Power Panels

Bernardino Garay, Clara Merino,
Raphael Sarkar, Sonam Sherpa
Advisor: Shamsur Mazumder

10:30am

Maximum Power Point Tracking

Yejee Choi, Monineath Khun, Giselle Verbera
Advisor: Alexander Emanuel

10:45am

Smart Recloser

Hung Ngo
Advisor: Alexander Emanuel

11:15am

Pressure Ulcer Prevention System

Amanda Agdeppa, Syed Hussain,
Hyunsoo Kim, Victoria Loehle
Advisors: John McNeill, Shamsur Mazumder,
Stephen Bitar, Yitzhak Mendelson (BME),
Walter Towner (BUS)
Sponsor: NECAMSID Lab

11:30am

Autonomous Cargo-Aircraft Project

Erik Nadel, Benjamin Gillette, Nicholas Cyganski,
Killian Henson, Keshuai Xu, Xavier Little
Advisors: Fred Looft, Michael Ciaraldi (CS)
Sponsor: ACAP

11:45am

Smart Home Energy Controller

Erik Meier, Andrew Reyburn
Advisor: Fred Looft

12:00pm

Using iBeacon for Navigation and Proximity Awareness in Smart Buildings

Qusai Alhumoud, Cristopher Connor,
David Goodrich
Advisors: Kaveh Pahlavan, Jahangir Rahman

1:00pm

Layout Design and Simulation of a VCO-Based ADC

Yue Lie, Julia Szemiot, Htay Win
Advisor: Stephen Bitar
Sponsor: NECAMSID Lab

1:15pm

Smart Snow Meter

Arturo Cardoni, Melissa Rivera, Sean Watson
Advisor: Stephen Bitar

1:30pm

Efficient LED Headlight Heating System

Daniel Bettigole, Jacqueline Campbell,
Nicholas Comei
Advisors: Stephen Bitar, Shamsur Mazumder

1:45pm

Music and Wearable Tech

Matthew Barreiro, Erin Ferguson, Liam Perry
Advisor: William Michalson

2:15pm

Encoding and Physical Study of the Canbus Sensor Network

Klaudia Linek, Anna Hernandez
Advisor: Alexander Wyglinski

2:30pm

Goat Cart: The Autonomous Golf Cart

Kyle Cederberg, Rebecca Dall’Orso,
Calvin Figuereo-Supraner, Patrick Long
Advisor: Alexander Wyglinski

2:45pm

Binary Analysis and Symbolic Execution with angr

Eric Cheng
Advisor: Alexander Wyglinski

3:00pm

Analyzing Computer Architecture of Intel Processors for Time Critical Applications

Amanda Gatz
Advisor: Alexander Wyglinski

3:15pm

A Multi-Purposed Aerial Software Defined Radio Platform

Narut Akadejdechapanich, Scott Iwanicki,
Max Li, Kyle Piette, Jonas Rogers
Advisor: Alexander Wyglinski

3:30pm

Cybersecurity

Rosemary Lindsay, Alexander Hebert,
Chandler Reynolds, Kyle Stack, Joy Tartaglia
Advisors: Lee Sheldon (CS), Alexander Wyglinski,
Lane Harrison (CS)

Atwater Kent Labs, Room 233

10:00am

Deep Learning for Int Tr

Javier Menchaca Gallegos, Mengwen Li
Advisors: Xinming Huang, Emmanuel Agu (CS)
Sponsor: Mathworks

10:15am

IoT for Smart Health

Maria Rios-Martinez
Advisor: Xinming Huang

10:30am

Coffee Can Radar: Detection and Jamming

Michael Inserra, Daniella Morico,
Gabriela de Peralta
Advisor: Alexander Wyglinski
Sponsor: NECAMSID Lab

10:45 am

RSS-Based 3D Drone Localization and Performance Evaluation

Zilu Tian
Advisor: Kaveh Pahlavan, Suzanne Weekes (MA)

11:15am

Virtual Human Male Model

Patrick Lacroix, Nicholas Maino
Advisors: Sergey Makarov, Gregory Noetscher

11:30am

FEA of TMS Case Study

Edward Burnham
Advisor: Sergey Makarov
Sponsor: Mass General Hospital

11:45am

Design and Development of Myoelectric Transradial Prosthesis

Steven Souto
Advisors: Sergey Makarov, David Planchard (ME)

12:00pm

An Exploration of Maximum Power Point Tracking

Johnathan Adams, Benjamin Beauregard,
Andrew Flynn
Advisor: Alexander Emanuel

1:00pm

SAR Drone Sensor Suite

Andrew Kelleher, Austin Kosin,
Joshua Ledee, Bryan Sellers
Advisor: Susan Jarvis

1:15pm

Universal Evaluation Platform

Dylan Baranik, Sagar Mahurkar,
Jorgo Mihallari, Erik Paulson
Advisors: Susan Jarvis, Jahangir Rahman

1:30pm

Automatic Weapon Detection (AWeD)

Georgios Karapanagos, Carlos Monterrosa-Diaz,
Glen Mould, Skyler Alsever, Paul Raynes
Advisors: Susan Jarvis, Nicholas Bertozzi (RBE)

1:45pm

Dynamic Volume Adjuster

Stephen Blouin, Anthony Ratte,
Samuel Shurberg, Samuel List
Advisor: Berk Sunar

2:15pm

Smart Home System

Thinh Ly, Anh Tran, Duc Tran
Advisor: Reinhold Ludwig

2:30pm

MRI Compatible Optical Force Sensor

Brian Hecker, James Maliff,
Lumbini Parnas, Corin Rypkema
Advisors: Gregory Fischer (RBE),
Cosme Furlong-Vazquez (ME)

2:45pm

Solar Maximum Power Point Tracking

Joseph Agresta, Nicole Mikolajczak
Advisor: Fred Looft

3:00pm

Volumetric Display Research

Roger Santos, Oliver Simon
Advisor: James Duckworth

3:15pm

iBeacon Attendance Monitoring

Raymond Otieno, Savannah Redetzke,
Andrew Vanner
Advisor: Kaveh Pahlavan, Jahangir Rahman

Environmental Engineering

POSTER SESSIONS, 1:15 to 3:30pm Kaven Hall 2nd Floor Hallway

An Evaluation of the Living Systems

Laboratory's Capacity to Treat Stormwater

Sierra Fraioli, Nathan Meersman, Evan Pereira
Advisors: Paul Mathisen, Derren Rosbach

**Analysis of the Decentralized Wastewater
Treatment System at Woodlands Village**

Julia Bushell (CM), Sierra Fowler (CM),
Matthew Houghton, Abigail Nack (CM),
Chris Xavier (CM)
Advisor: Suzanne LePage
Sponsor: Woodlands Village Condominium
Development

Coes Pond Stormwater Management

Brendan Kling, Adam Weiss
Advisor: Paul Mathisen
Sponsor: Tatnuck Brook Watershed Association

**Designing a Constructed Wetland to Improve
Water Quality in Framingham, Mass.**

Cara Berezna, Anna Franciosa,
Kathryn Murphy, Jacqueline Tedesco
Advisor: Paul Mathisen

**Environmental Effects of Coal Tar-Based
Pavement Rejuvenators**

Seth MacDonald, Caroline Meyer
Advisor: John Bergendahl

**Evaluating the Role of Stormwater Treatment
Basins in Controlling Highway Runoff Quality**

Elizabeth Desjardins, Julia Scott, Anna Valdez
Advisors: Suzanne Le Page, Paul Mathisen

**Exploring the Potential for Reclaimed
Wastewater Applications: Designing a Feasible
and Beneficial Reuse Process for the Upper
Blackstone Water Pollution Abatement District**

Jenna O'Connell (CM), Mary Prescott,
Meghan Trahan
Advisors: John Bergendahl, Stephen Kmiotek (CM),
Wayne Bates

Measuring CO2 Flux in Highway Buffer Zones

Annie McDonald-Schwartz, Matthew Michaels,
Nicholas Santangelo, Alexis Sturgis
Advisors: John Bergendahl, Rajib Mallick

**Restoration of the Walker Street Culverts in
Norton, Massachusetts**

Jackson Krupnick, Julia Pershken
Advisor: Paul Mathisen
Sponsor: Town of Norton, Mass.

**Salinity Impacts on Coastal Wastewater
Treatment**

Amy Krayner, Matthew Michaels (CM),
Talia Solomon
Advisor: John Bergendahl

Humanities and Arts

Higgins House, Library

12:30pm

**WPI & Diversity Competency: Developing an
Inclusive and Diverse Community on Campus
Creates Effective Engineers**

Gyneth Campbell
Advisor: Peter Hansen

12:50pm

**Speaking Denglish: Exploring the Impact of
Denglish and Anglicisms in German Culture
and Identity**

Leah Holt
Advisor: Ulrike Brisson

1:10pm

History of Nuclear Weapons

Samantha Gauthier
Advisor: Peter Hansen

1:30pm

**Feasibility of Digitizing LEI Evaluations with an
Internationalized ASSISTments**

Bryce Kaw-uh
Advisors: Aarti Madan, Neil Heffernan (CS)
Sponsor: Latino Education Institute WSU

1:50pm

Relieving Anxieties in the Pre-Modern and Industrial World

Carolina Ramos

Advisor: Bland Addison

2:10pm

The International Dimensions of Water Recycling at the American Farm School (Greece)

Nikos Kalaitzidis

Advisor: Bland Addison

Sponsor: The American Farm School in Thessaloniki, Greece

Interactive Media & Game Development

Fuller Labs, Lower Perreault

1:00pm

Design and Authorship for the Halberd Narrative Planning Engine

Richard Hayes, Myles Karam, Jonas McGowan-Martin, Brian Rubenstein, Gareth Solbeck

Advisors: Mark Claypool, Charles Rich, Ryan Madan (PW)

1:15pm

Cybersecurity Game

Alex Hebert, Rosemary Lindsay, Chandler Reynolds, Kyle Stack

Advisors: Lee Sheldon, Lane Harrison

1:30pm

The Conduit's Garden

Alex Guerra, John Nelson, Paul Orvis

Advisors: Jennifer deWinter, Charles Rich

Sponsor: Osaka University Project Center (Japan)

1:45pm

Battle Patrol

Christopher Dowding, Thomas Lourenco

Advisors: Brian Moriarty, Ralph Sutter

2:00pm

Using Image Recognition Technology as a Gameplay Mechanic

Thomas Meehan, Yahel Nachum, Andrew Ray

Advisors: Brian Moriarty, Charles Rich

2:15pm

Velum

August Beers, Nicholas Chaput, Connor Mattson, Connor Thornberg, Jie Weng

Advisors: Brian Moriarty, Ralph Sutter, Jacob Whitehill (CS)

2:45pm

Hira Hero: Learning Hiragana Fluency Through Gameplay

Yuheng Huo, Jesse Marciano, Adam Myers

Advisors: Jennifer deWinter, Charles Rich

Sponsor: Osaka University Project Center (Japan)

3:00pm

Mathspring for Latinx Students

Student: Rachel Burton

Advisors: Alexandrina Agloro, Ivon Arroyo

3:15pm

Sustainable Aquaculture Game

Students: Liam Miller, Michel Sabbagh

Advisors: Brian Moriarty, Ralph Sutter

3:30pm

A Gamified Approach to Academic Learning in a High School Biology Curriculum

Samuel Conley

Advisor: Lee Sheldon

3:45pm

ARIN

Graham Held, Isabella Schiavone,

Matthew Thompson, Dongjie Wang

Advisors: Jennifer deWinter, Ralph Sutter

4:00pm

Physical Games for Learning II

Matthew Micciolo

Advisor: Ivon Arroyo

4:15pm

Step Symphony

Marco Duran, LilyAnne Lewis, Sienna McDowell

Advisor: Jennifer deWinter

Sponsor: Ritsumeikan University Project Center (Japan)

Mathematical Sciences

Higgins Labs, Room 218

9:00am

Flexible Infrastructure Supporting Machine Learning for Anomaly Detection in Big Data

Ziyan Ding, Erin Esco,
Alexander Huot, Yihong Zhou

Advisors: Jian Zou, Elke Rundensteiner (CS)

Sponsor: ACI Worldwide

9:15am

RSS-Based 3D Drone Localization and Performance Evaluation

Zilu Tian

Advisors: Suzanne Weekes,
Kaveh Pahlavan (ECE)

9:30am

Kirchhoff Graph Construction

Marcel Gietzmann-Sanders

Advisor: Joseph Fehribach

9:45am

Process Mining the Credit Suisse Advisory Process

Shannon Feeley, Gina Rios

Advisors: Randy Paffenroth, Stephan Sturm

10:00am

Modeling Over-the-Counter Derivative Trading with and without Central Clearing Parties

Natalie Wellen

Advisor: Stephan Sturm

10:15am

Quasiconformal Gradient Flows

Weizhe Shen

Advisor: Luca Capogna

10:30am

A Mathematical Analysis of Zeolites

Yani Lindbergh DeAraujo

Advisor: Brigitte Servatius

10:45am

Application of Data Analytics to Cyber Forensic Data

Yao Yuan Chow

Advisors: Randy Paffenroth,
George Heineman (CS)

Sponsor: MITRE Corporation

11:15am

Modeling-Backed Microwave Imaging in Closed Systems: Reconstruction of a Spherical Inhomogeneity

Taylor York

Advisor: Vadim Yakovlev

Sponsor: MACOM

11:30am

Enhancing Career Opportunities: Using Supervised Learning to Analyze Career Outcomes Data

Sadie Gauthier, Zachary Peters,
Robert Vigeant, Emily Weber

Advisor: Randy Paffenroth

Sponsor: Dave Ortendahl, CDC

11:45am

Symmetric, Informationally Complete, Positive Operator Valued Measures

Junjiang Le

Advisors: William J. Martin, P. K. Aravind (PH)

12:00pm

Quantum Algorithms from a Linear Algebra Perspective

Lauren Baker, Liam Ogren

Advisors: William Martin, P. K. Aravind (PH)

12:15pm

Acoustically Enhanced Cooling of Thin Fluid Sheets

Thomas deRito

Advisor: Burt Tilley

12:30pm

Cyber Security Network Anomaly Detection and Visualization

Heric Flores, Jacob Link, Cassidy Litch

Advisors: Randy Paffenroth, Lane Harrison (CS)

12:45pm

Investigating Whether a Social Media Presence Impacts Claim Severity

Elizabeth Beazley, Katherine Curran,
Anton Libsch, Robert Ronacher

Advisor: Jon Abraham, Barry Posterro

Sponsor: Hanover Insurance Group

1:00pm

Projecting the Ultimate Loss of Catastrophic Events

Siro Fritzmann, Elizabeth Hansen,
Amber Munderville, Mike Sullivan,
Tyler Turchiarelli

Advisors: Jon Abraham, Barry Posterro

Sponsor: Hanover Insurance Group

Mechanical Engineering

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

Biomechanical Engineering

Design of a Transfer Device for an Eight-Year-Old Student

Lindsey Andrews, Jonathan Rheume,
Yingzhe Zhao

Advisors: Holly Ault, Allen Hoffman

Synthesizing an Artificial Hand for Tasks Requiring Fine Motor Control

Caitlin Grow

Advisor: Pradeep Radhakrishnan

Equine Lung Function Testing

Lucy Garvey, Lubna Hassan,
Kyla Nichols, Allison Paquin

Advisors: Marsha Rolle (BME), Robert Daniello
Sponsor: Dr. Melissa Mazan, Cummings School of
Veterinary Medicine at Tufts University

Designing a Biomimetic Prosthetic Flipper for a Kemps Ridley Sea Turtle

Frederick Burgwardt, Paul DePlacido,
Andrew Dunne, Christopher Ryan,
William Pope, Aryelle Teixeira

Advisor: Brian Savilonis

Improved Backpacking Load Carriage System

Delaney Cassidy, Emma Healey,
Kimberlee Kocienski, Benjamin Pulver

Advisor: Brian Savilonis

Finite Element Analysis and 3-D Printing of the Shoulder Joint and Glenohumeral Labral Tears

Kenneth Swanson

Advisor: Satya Shivkumar

Designing a Passive Knee Brace for Sit-to-Stand Assistance

Ethan Paul

Advisor: Karen Troy (BE)

Design

Design of a Customizable Assistive Utensil Grip

Kyle Fitzgerald, Adam Huber, Winton Parker

Advisors: Holly Ault, Allen Hoffman

Design and Analysis of Cognitive Focus Devices

Brianna Fogal, Connor McGrath,
Carolina Ramos, Ashley Stanley, Daniel Sturman

Advisors: Torbjorn Bergstrom, Walter Towner
(MG), Bland Addison (HU), Helen Vassallo (MG)

Designing and Building a Ski Binding Tester

Jesse Kablik

Advisor: Christopher Brown

Multi-Mode Load-Limiting and Absorptive Ski Binding

Jacob Billington, Jonathan Comden,
Sean Regan, Thomas Roberti

Advisor: Christopher Brown

Extendable Pedal Car

Matthew Farrell, Alexa Stevens, Zachary Styer

Advisor: Eben Cobb

Quick Return Mechanism

Zach Belohoubek, Ellyn Webber

Advisor: Eben Cobb

Table-Top Demonstration Device

Charles Bleakney, Jarrod Peloquin

Advisor: Eben Cobb

Trash Lifter

Erin Bracken, Ian Converse,
Michael Duclos, Austin Scott

Advisor: Eben Cobb

Tree Stand Redesign

Huda Gad, Evan Pilaar

Advisor: Eben Cobb

Developing the Ice Device

Anthony DiBasio, Zoe Eggleston,
Alexander Grammenos

Advisor: Robert Daniello

Micro-Hydro Intake and Greenhouse Design

Aaron McGinnis, Paige Myatt, Nathan Peterson

Advisors: Robert Daniello, Steve Kmiotek (CHE)

Sponsor: Te Runanga o Ngāti Kea Ngāti Tuara of
Horohoro, New Zealand

Design of a Hand Orthosis

Connor Kurtz, John Mulready,
Steven Murphy, Tyler Tao

Advisors: Allen Hoffman, Holly Ault

Optical Chopsticks

Isaac Coelho, Matthew Haley

Advisor: Yuxiang Liu

Optical Conveyor Belt

Brandon Bozeat, Jonathan Stump

Advisor: Yuxiang Liu

Autonomous Aircraft Retrofit

Karl Sundberg

Advisor: Fred Looft (ECE)

Summer Kite Power 2

Andrew Bauer, Christopher Beauchemin,
Alexander Draper, Obadiah Munene, Jonathan
Van Blarcum, Hanqing Zhao

Advisor: David Olinger

3D Printing Thermal Expansion

Connor Barrett, Joseph Presing

Advisors: Amy Peterson (CHE),
Anthony D'Amico (CHE)

Design and Development of a Myoelectric Transradial Prosthesis

Cameron Currie, Cameron Downey,
David McDonald, Rae Nistler, Gregory Port,
Joseph Sabatino, Steven Souto
Advisors: David Planchard, Tiffiny Butler (BME),
Sergey Makarov (ECE), Craig Putnam (CS)

Design and Optimization of a SAE Baja Chassis

Heather Selmer, Sabbrin Shweiki, Paige Tencati
Advisors: David Planchard, John Hall

Design of a Personal Aerial Vehicle

Matthew Lepine
Advisors: David Planchard, John Hall

Optimization and Design of an FSAE Frame and Suspension

David Powers, Jonathan Ross,
Constantine Scaperdas, Christian Storbel
Advisors: David Planchard, John Hall,
Kevin Sweeney (MG)
Sponsor: SAE

Developing Automated Design and Analysis Tools

Corey Alicchio, Callum Taylor, Justin Vitiello
Advisor: Pradeep Radhakrishnan

Developing Methods and Graph Representations for Automated Design of Gear Trains

Penelope Belliard, Ruizhe Chen, Yingjie Lu
Advisors: Pradeep Radhakrishnan,
David Brown (CS)

Terahertz Testing Fixture

Andrew Belz, Michael Cournoyer,
Anthony Lawinger
Advisors: Pratap Rao, Lyubov Titova (PH)

Towards the Optimization of a Fin-Based Hydropower Generator

Casey Broslawski, Frank DeGiacomo,
Keaton Goddard, Christopher Parisi
Advisor: Brian Savilonis

The Synthesis and Design of a Small Speaker System

Shawna McGaffigan, Ryan Smolenski
Advisor: Joseph Stabile

Design and Build an Innovative 3D Printer

Alex Beaudoin, Nicholas Borowski,
Robert Boulanger, Paul Danielson,
Jessica DiPersio, William Gorman,
Cameron Hastings, Daniel Pfaff, Michael Wray
Advisor: John Sullivan

Engineering Experimentation Module Designs

Peter Ofsthun, Elizabeth Thompson
Advisor: John Sullivan

Fetching Interactive Dog Occupier (FIDO)

Joseph Alvarado, Bianca Espinoza, Johnly Lin,
Doon Nordemann, Tiana Vasquez
Advisor: John Sullivan

Revamping ME3901 for Modular Distribution

Jeffrey Brathwaite
Advisor: John Sullivan

Manufacturing**Analysis of Edge Curvature and Roughness in Slicing**

Jake Porrazzo, Michael Sheahan, Scott Spear
Advisor: Christopher Brown

Materials**Development of an Experimental Optimization Method in Laser-Assisted Cold Spray**

Sean Hathaway, Mikhail Khibkin,
Matthew Nicholson
Advisor: Diran Apelian
Sponsor: IPG Photonics

Design of Small-Scale Furnace for Fire Resistance Testing of Building Construction Materials

Joseph Igoe, Xander Ing, Kevin Lynch,
Dylan Martel, Lynn Renner, Tara Sharp,
Austin Smith, Steve Thulin
Advisor: Nicholas Dembsey (FPE)

Crack Detection Using Wavelets

Theofilos Gatsos
Advisor: Zhikun Hou

Transport Properties Measurements in Aluminum Alloys

Gyneth Campbell, Scott Davison,
Adam Gatehouse, Daniel Mortarelli
Advisors: Diana Lados,
Germano Iannacchione (PH)

Assessing Carbon Footprint

Richard Coffin, Matthew Puksta,
Muhammad Siddiq, Antonio Aimilios Tachiaos
Advisor: Brajendra Mishra
Sponsor: Automotive Recyclers of Massachusetts

Fabrication and Properties of Novel Polymer-Metal Composites Using 3D Printing

Daniel Braconnier, Kristin Markuson,
Mila Maynard
Advisors: Amy Peterson (CHE), Diana Lados,
Germano Iannacchione (PH)

Flexible Solar Cell

Francis LaRovere, Michael McMahon,
Edward Peglow
Advisors: Pratap Rao, Cagdas Onal

Robotics Engineering

Dexter: Assistive Intelligence for Transradial Amputees

Sienna Mayer, Gabrielle O'Dell, Yesugey Sipka
Advisors: Cagdas Onal, Kristen Billiar (BME), William Michalson (ECE)

Humanoid Stereoscopic Vision System

Tyler Chaulk, Rodrigo Rivas,
Ann Votta, Jacob Wennersten
Advisors: Cagdas Onal, Holly Ault

Accurate Prosthetic Hand

Casey Kracinovich, Mervyn Larrier,
Dylan Renshaw, Elina Saint-Elme
Advisor: Marko Popovic (PH)

Robodog

Yunda Li, Michael Pickett
Advisors: Marko Popovic (PH),
Pradeep Radhakrishnan

Robotic Mining Platform

Dom Bozzuto, Rene Jacques, Aaron Jaeger,
Brian Peterson, Yu-sen Wu
Advisors: Ken Stafford, Michael Ciaraldi (CS)

Thermofluids

Modular Geothermal Heat Pumps

Veronica Delaney, Zachary Ericson, Keirsten Field
Advisors: Robert Daniello, Christopher Scarpino

Materials Fire and Thermal Properties — Low E Windows

Perry Ascani, Garrett Curran, Sai Sett Paing,
Madelyn Werth
Advisor: Nicholas Dembsey (FPE)

Vortex Tube Cooling System

Devin Duarte, Kimberly Rosa,
Daniel Ruiz-Cadalso
Advisor: Cosme Furlong

Design and Construction of an Advanced Solvent Recycling System (Acetone Distiller)

Travis Simoneau
Advisors: Selçuk Güçeri, Stephen Kmietek (CHE)

Synthesis of an Air Manifold for an Adaptive Suspension System

Jake Nieto, Jorge Santana
Advisors: Pradeep Radhakrishnan,
Robert Daniello

Harvesting Hydrokinetic River Current Power

Megan Belval, Hallie Kenyon, Robert LaFlamme,
Sarah Putnam
Advisor: Brian Savilonis

Vortex Induced Vibration Energy Harvesting Through Piezoelectric Transducers

Natalie Diltz, Julie Gagnon,
Jacqueline O'Connor, Jessica Wedell
Advisor: Brian Savilonis

Next Generation, Smart Fluid Storage Tank for Space and Terrestrial Applications

Jon Barruetabena, Connor McGuirk,
Lily Ouellette
Advisor: Jamal Yagoobi

Physics

Olin Hall, Room 107

8:30am

Gen IV Neutron Reactor Design

Sultan Jilani and Ivan Melnikov
Advisors: David Medich, Craig Wills (CS)

8:45am

Finite Element Modeling of Finite Single and Double Quantum Wells

Yuchen Wang
Advisors: Padmanabhan Aravind,
Ramdas Ram-Mohan

9:00am

Survey and Analysis of 1st Year Physics Labs for Selected Colleges

Wesley Bellerman
Advisor: Frank Dick

9:15am

Terahertz and Optical Spectroscopy of Rare Earth Doped Materials

Ben Dringoli
Advisors: Richard Quimby, Lyubov Titova

9:30am

Ytterbium Neutron Cross Section

Norbert Hugger
Advisor: David Medich

9:45am

Finite Element and QFT

Muping Chen
Advisor: Ramdas Ram-Mohan

10:00am

Multiphase Metallic Diffusion

Rui Yu
Advisors: Ramdas Ram-Mohan,
Marcus Sarkis-Martins (MA)

10:15am

Holographic Hawking Effect

Dominic Chang

Advisors: Leo Rodriguez (Assumption College),
Shanshan Rodriguez

10:45am

**A First Principle's Approach to
Propeller-Intrinsic Losses**

Stephen Olis

Advisor: Marko Popovic

11:00am

**Simulating Tau Neutrino Events in the
IceCube Array**

Mykalin Jones

Advisors: Frank Dick, David Medich,
Shaun Marshall (grad student)

Sponsor: IceCube Neutrino Telescope

11:15am

Brachytherapy with Ytterbium-169

Sergey Korkhov

Advisor: David Medich

11:30am

**Removal of Accidental Degeneracy in
Cubic Quantum Dots**

Christopher Pierce

Advisor: Ramdas Ram-Mohan

11:45am

Surface Undersea Kites for Power Generation

Peter Melander

Advisors: Nancy Burnham, David Olinger (AE)

12:00pm

Fiber Optic Tweezers for Cell Studies

William Beatty

Advisor: Qi Wen

12:15pm

Brain SPECT Collimator Design

Yulun He

Advisors: Zhikun Hou (ME), David Medich

Sponsor: Dr. Michael King, UMass Medical School

12:30pm

**Evaluation of Intensity Modulated Brachytherapy
Using Ytterbium-169**

Amanda Leahy

Advisors: David Medich

Professional Writing

POSTER SESSIONS

11:30–12:30 / 2:30–3:30

Higgins House, Great Hall

**Creating an Online Introductory Guide to
Biomedical Grant Proposals**

Alexandra D'Ordine

Advisor: Lorraine Higgins

**Popularized Synthetic Biology: Public Perception
and Understanding, 2006–2016**

Kimberly Coddington

Advisor: Brenton Faber

**Design and Authorship for the Halberd Narrative
Planning Engine**

Richard Hayes

Advisors: Ryan Madan, Charles Rich (CS),
Mark Claypool (CS)

**Enhancing Career Opportunities: Using
Supervised Learning to Analyze Career
Outcomes Data**

Robert Vigeant

Advisor: Brenton Faber

Sponsor: Dave Ortendahl, CDC

The Monomyth in Popular Science Writing

Isabella Schiavone

Advisors: Jennifer deWinter, Ralph Sutter (IMGD)

**Dust-Covered Operations & Maintenance Manuals:
Why O&M Manuals for Wastewater Treatment
Facilities Rarely Meet Operators' Needs**

Abigail Nack

Advisors: Ryan Madan, Stephen Kmietek (CHE),
Suzanne LePage (CEE),

Sponsor: Woodlands Village at Hickory Hills Lake

Sepsis and Comorbidities in a Rural Area

Meredith Rioux

Advisor: Brenton Faber

Sponsor: Canton-Potsdam Hospital, Potsdam, NY

Autism and Sensory Processing Disorder

Matthew Moore

Advisor: Brenton Faber

Robotics Engineering

Atwater Kent Labs, Room 116

9:00am

Robotic Automated Wingsail

Kelsey Regan, Dean Schifilliti, Daniel Singer
Advisor: Kenneth Stafford

9:15am

Dexter: A Smart Prosthetic Device for Transradial Amputees

Sienna Mayer, Gabrielle O'Dell, Yesugey Sipka
Advisors: Kristen Billiar (BME), William Michalson, Cagdas Onal

9:30am

Sailbot: Autonomous Robotic Sailboat

Nicholas Gigliotti, James Kuszmaul, Tucker Martin, Ryan Wall
Advisors: William Michalson, Kenneth Stafford

9:45am

Control of a Bipedal Robot

Georgios Ardamerinos, Ari Goodman, Sam Khalandovsky, Alex O'Brien, Logan Tutt
Advisors: Jie Fu, Kenneth Stafford

10:15am

5-Axis 3D Printing

Ethan Coeytaux, Cameron Crook, Alexandre Pauwels, Hugh Whelan
Advisors: Diran Apelian (ME), George Heineman (CS), Craig Putnam, Gabor Sarkozy (CS)

10:30am

Fire Containment Drone

William Boyd, Zachary Hood, John Lomi, Chase St. Laurent, Kyle Young
Advisor: William Michalson

10:45am

Low Cost Quadrupeds

Josh Graff, Alonso Martinez, Kevin Maynard, Alex Bittle
Advisor: William Michalson

11:00am

Landmine Detection Rover

Brendan Casey, Trevor Rocks
Advisor: Craig Putnam

11:30am

Autonomous Snowblower

Daniel Pongratz, Nicholas Rowles, Harrison Vaporciyan
Advisor: William Michalson

11:45am

Blisk Inspection System

Breanne Happell, Karen Orton, Kevin Ouellette, Charles Sinkler
Advisors: Michael Gennert, Craig Putnam, Kenneth Stafford
Sponsor: GE Aviation

12:00pm

Swarm Robotics

Nathaniel Jefferson, Peter Raspe, Nam Tran-Ngoc
Advisor: Michael Ciaraldi (CS)

12:15pm

MRI Compatible Optical Force Sensor

Brian Hecker, James Maliff, Lumbini Parnas, Corin Rypkema
Advisors: Gregory Fischer, Cosme Furlong-Vazquez (ME)

1:15pm

The Autonomous Cargo Aircraft Project (ACAP)

Nicholas Cyganski, Benjamin Gillette, Killian Henson, Keshuai Xu
Advisors: Michael Ciaraldi (CS), Fred Looft (ECE)

1:30pm

AWeD: Automatic Weapon Detection

Skylar Alsever, Georgios Karapanagos, Carlos Monterrosa Diaz, Glen Mould, Paul Raynes
Advisors: Nicholas Bertozzi, Susan Jarvis (ECE)

1:45pm

EvoSim — Evolving Artificial Life Simulation

Yigit Uyan
Advisor: Michael Ciaraldi (CS)

2:00pm

CARP - Custom Autonomous Robotic Painter

Odell Dotson, Katie Gandomi, Alora Hillman, Nicholas Panzarino
Advisors: Jie Fu, Michael Gennert, Kenneth Stafford

2:15pm

Cold Chain Device Viability for UAS Delivered Medical Supplies

Michael Beinor, Evan Bosia, Scott Cazier, Keegan Train
Advisors: Gregory Fischer, Jianyu Liang (ME)

2:45pm

Design and Development of a Myoelectric Transradial Prosthesis

Cameron Currie, Cameron Downey, David McDonald, Ashley Nistler, Gregory Port, Joseph Sabatino, Steven Souto
Advisors: Tiffany Butler (BME), Sergey Makarov, David Planchard (ME), Craig Putnam (ECE)

3:00pm

CHAMP: Tree Climbing Robot

Devon Bray, Mead Landis, Rachael Putnam

Advisors: Michael Gennert, Brad Miller,
Kenneth Stafford

3:15pm

**Robodog: A Low-Cost Electrically
Actuated Quadruped**

Yunda Li, Michael Pickett

Advisors: Marko Popovic, Pradeep Radhakrishnan

3:30pm

Markhor: Robotic Mining Platform

Domenic Bozzuto, Rene Jacques, Aaron Jaeger,

Brian Peterson, Yu-sen (Jason) Wu

Advisors: Michael Ciaraldi (CS), Kenneth Stafford

3:45pm

Dynamic Prosthetic Socket

Michael Chan, Alexander Fitzgerald, James Honicker

Advisors: Gregory Fischer,

Christopher Nycz (grad student)

4:15pm

**Development of a Post-Fabrication Stiffness
Characterization Tool for MEMS Devices**

Michael McConnell, John Williams, Shao Zhou

Advisor: Cosme Furlong-Vazquez (ME)

4:30pm

Plume Analysis and Detection

Eric Fast, Stephen Harnais, Ryan Wiesenber

Advisors: Raghvendra Cowlagi,

Michael Demetriou (AE), Nikolaos Gatsonis (AE)

4:45pm

Hospital Lobby Assistant

Joseph Fainer, Tom Farro, Jacob Hackett,

Erin Leger, Emily Yu

Advisors: Gregory Fischer, Candace Sidner (CS)

5:00pm

Accurate Prosthetic Hand

Casey Kracinovich, Mervyn Larrier,

Dylan Renshaw, Elina Saint-Elme

Advisors: Marko Popovic

5:15pm

Automated 3D Print Farm

Alexander Ruggiero, Kevin Valente-Comas,

Lauren Pontbriant, Dasan Costandi

Advisor: Craig Putnam

Social Science and Policy Studies

Salisbury Laboratories, Room 305

9:00am

**Gender-Based Differences in Amyotrophic Lateral
Sclerosis and Parkinson's Disease Expression in
*C. Elegans***

Rebecca Burns, Aidan Burn (BBT),

Marissa Patterson (BBT)

Advisor: Jeanine Skorinko

9:30am

**Even Elementary Students Can Explore Algebra!:
Testing the Feasibility of *From Here to There!*, a
Game-Based Perceptual Learning Intervention**

Lindsay Braith

Advisors: Erin Ottmar, Jeanine Skorinko

10:00am

Dynamic Common Pool Resources

Zach Chapman

Advisors: Gbeton Somasse, Alex Smith

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, 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, 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



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 40 WPI project centers throughout the Americas, Africa, Asia-Pacific, and Europe.