UNIVERSITY OF PITTSBURGH

Mascaro Center for Sustainable Innovation

2019 Undergraduate Summer Research Projects

Reducing Emissions - Fuel Consumption Reduction Technologies for Pittsburgh Port Authority Buses
Advisor: *Matthew Barry, mechanical engineering & materials science*
Student: *Kathryn Rossi, chemical & petroleum engineering (John C. Mascaro Scholar)*

Silk-based flexible/wearable electronics: towards sustainable fabrication and materials engineering
Advisor: *Mostafa Bedewy, industrial engineering*
Student: *Rim Biaz, industrial engineering (John C. Mascaro Scholar)*

Validating citizen science tools used to identify lead water lines
Advisor: *Mike Blackhurst, university center for urban and social research*
Student: *Arianna Heilbrunn, environmental studies (John C. Mascaro Scholar)*

Ni-Mn-Ga magnetic shape memory alloys for power generation applications
Advisor: *Markus Chmielus, mechanical engineering & materials science*
Student: *Tyler Paplham, mechanical engineering & materials science (John C. Mascaro Scholar)*

Chemical semantics and its implications on environmental transport, fate, and toxicity
Advisors: *Leanne Gilbertson and Carla Ng, civil & environmental engineering*
Student: *Rachel Fay, civil & environmental engineering (John C. Mascaro Scholar)*

Small & Mighty: Exploring nature to identify bacteria capable of degrading a new generation of environmental contaminants
Advisor: *Sarah Haig, civil & environmental engineering*
Student: *Kareem Rabbat, civil & environmental engineering (Charles and Linda Sorber Scholar)*

Structural Design with Bamboo
Advisor: *Kent Harries, civil & environmental engineering*
Student: *Stephanie Martinos, architectural studies (John C. Mascaro Scholar)*

Capturing and storing energy from hurricane waves with a piezoelectric device
Advisor: *Katherine Hornbostel, mechanical engineering & materials science*
Student: *Stephanie Litwack, mechanical engineering & materials science (John C. Mascaro Scholar)*

Capturing carbon dioxide from the ocean with a membrane device
Advisor: *Katherine Hornbostel, mechanical engineering & materials science*
Student: *Christopher Snodgrass, bioengineering (John C. Mascaro Scholar)*

Reducing frictional energy losses in transportation and industry: Surface coatings and the effect of surface roughness on friction
Advisor: *Tevis Jacobs, mechanical engineering & materials science*
Student: *Annie Shi, mechanical engineering & materials science (John C. Mascaro Scholar)*

Using acoustic sensors and machine learning to locate birds and bats in the field
Advisor: *Justin Kitzes, biological sciences*
Student: *Jiade Song, industrial engineering (John C. Mascaro Scholar)*

Durable Antireflective, Anti-Soiling and Self-Cleaning Solar Glass
Advisor: *Paul Leu, industrial engineering*
Student: *Sooraj Sharma, mechanical engineering & materials science (John C. Mascaro Scholar)*

Designing new ways to test the performance of large-scale battery technologies
Advisor: *James McKone, chemical & petroleum engineering*
Students: *Carissa Yim, chemical & petroleum engineering (Frank and Daphna Lederman Scholar)*

Smarter Riversheds – real-time sensor networks
Advisor: *David Sanchez, civil & environmental engineering*
Student: *Carlie Johnson, civil & environmental engineering (John C. Mascaro Scholar)*

Recirculating Aquaculture – managing water quality in a closed system
Advisor: *David Sanchez, civil & environmental engineering*
Student: *Mason Unger, civil & environmental engineering (John C. Mascaro Scholar)*

Campus-Wide Sustainability Dashboard
Advisor: *Aurora Sharrard, Director, University Office of Sustainability*
Collaborators: *Melissa Bilec & Michael Blackhurst, plus interactions with Pitt Facilities Management*
Student: *Jonathan Coles, civil & environmental engineering (John C. Mascaro Scholar)*

Increasing the Structural Resilience of Reinforced Concrete through Bio-Remediation
Advisor: *Max Stephens, civil & environmental engineering*
Student: *Aamil Shah, bioengineering (John C. Mascaro Scholar)*

What the Frack: Designing nanocatalysts for responsible use of natural gas
Advisor: *Goetz Veser, chemical & petroleum engineering*
Student: *Albert Lopez-Martinez, chemical & petroleum engineering (John C. Mascaro Scholar)*

Post-processing design on superalloys by additive manufacturing for NASA space technology missions.
Advisor: *Wei Xiong, mechanical engineering & materials science*
Student: *Yinxuan Li, mechanical engineering & materials science (John C. Mascaro Scholar)*

Graphene-based composite materials for high performance thermoelectric devices
Advisor: *Minhee Yun, electrical and computer engineering*
Student: *Seth So, electrical and computer engineering (Douglas Condon Scholar)*

Developing a novel photopolymer based additive manufacturing machine (3D Printer) for high-resolution applications
Advisor: *Xiayun Zhao, mechanical engineering & materials science*
Student: *Yue Zhang, mechanical engineering & materials science (John C. Mascaro Scholar)*