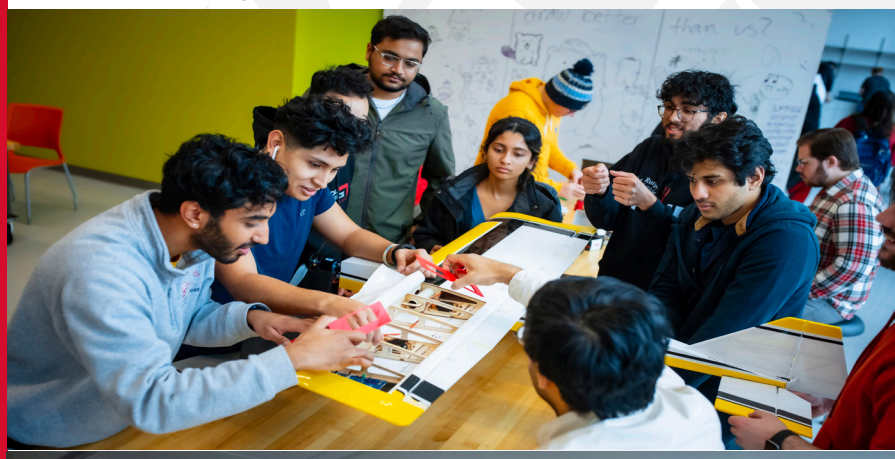
Mechanical and Aerospace Engineering
2023 Design and Manufacturing Expo
May 4, 2023

RUTGERS

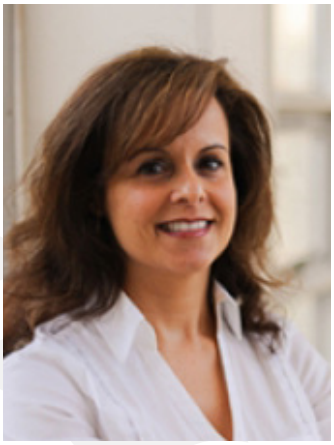
School of Engineering

RUTGERS
Mechanical and Aerospace Engineering

Course Coordinators	Prof. Xi Gu Prof. Assimina A. Pelegri
Teaching Assistants	Mr. Mohit Agarwal Mr. George Gianoukakis Mr. Chengwei Zhao
Design Specialists	Dr. Basily Basily Mr. Milan Simonovic
Seminar Speakers	*Dr. Jerry Shan Rutgers MAE* *Mr. Milan Simonovic Rutgers MAE* *Dr. Merrill Edmonds Siemens* *Ms. Cristy Richards JAKTOOL* *Mr. Ken Johnson Lockheed Martin (Ret.)* *Dr. Brandon "BT" Cesul KBR, Inc.* *Mr. Martin Hluchy Daimler Truck North America*



NOTE FROM THE CHAIR



We are very delighted about the 2023 Design and Manufacturing Expo. During this year's Expo, 41 groups will present their exciting projects, guided by our faculty. In addition, this event is a unique opportunity for our students to showcase their talent, innovation, ingenuity, teamwork, and engagement.

The Mechanical and Aerospace Engineering Department is a vibrant academic community offering three undergraduate degrees in Mechanical Engineering, Aerospace Engineering, and Applied Science (Packaging Engineering concentration). In addition, the Department offers graduate/advanced programs leading to M.S., M.Eng., and Ph.D. degrees.

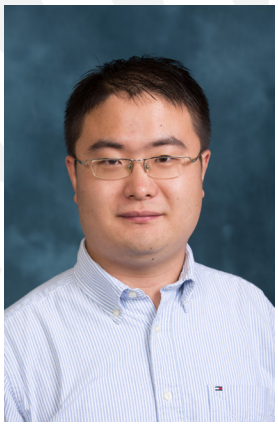
Our close to 40 full-time faculty members educate more than 850 undergraduate and 150 graduate students. Our thriving community of students, faculty, alumni, and industry partners is devoted to collaborative work at the highest standards of research and innovation. Our faculty members are dedicated to enabling our students to achieve success and become problem solvers and innovators. Students have access to a wide range of classes that train them in the core principles of mechanical and aerospace engineering. In addition, they can participate in research projects as undergraduates, allowing them to gain experience in real-world applications comparable to research conducted by industry. Our faculty has achieved distinction among their peers and as fellows of professional engineering societies, including the American Society of Mechanical Engineers (ASME), American Institute of Aeronautics and Astronautics (AIAA), American Physical Society (APS), Acoustical Society of America (ASA), and American Academy of Mechanics (AAM). Our Department has an exciting and multidisciplinary research portfolio, which includes advancing scientific knowledge and technology in various areas, including nanostructures, hypersonics, autonomous robotics, electro-hydrodynamics, fluid interactions, energy science, and advanced materials, among many others.

We are grateful to all judges for their sustained commitment and participation in this event and our external Advisory Board for its dedicated support through the planning and execution. Thanks to all the faculty advisors, for leading and coordinating the entire Senior Project Experience. To our staff, particularly Dr. Basily Basily and Mr. Milan Simonovic, for their technical advice in reviewing designs and manufacturing project components.

To our students, we are very proud of your efforts and accomplishments! We wish you a successful and rewarding career. Stay in touch!

Assimina A. Pelegri, Ph.D.
Professor and Chair
Department of Mechanical and Aerospace Engineering

NOTE FROM THE COORDINATORS



Dear students, parents, and friends,

We would like to take this opportunity to welcome you to the Mechanical and Aerospace Engineering Department at Rutgers! In the following pages, you will find the Senior Design projects for AY 2022-23. During these projects, students have the opportunity to work with industry and faculty advisors, gaining experience in real-world engineering. Many of these projects can lead to new technologies or other innovations outside of academia, and they help our students transition to life after graduation.

To our seniors, we celebrate your accomplishments and appreciate your efforts. Your class achieved record numbers in engaging in professional and educational development activities, including internships and co-Ops, JJ Slade fellowships, and undergraduate research opportunities. You are now at the finishing line, ready to explore the many "tomorrows" to come. Many of you will continue your education in the BS/MS program at Rutgers or pursue higher degrees at other institutions, and many of you, at the time of this letter, have secured jobs. We are very proud of you and what you have accomplished in the last four years. We know that this was not easy for many of you, but again you raised to the occasion, and you showed how innovative, entrepreneur, and resourceful our young MAE engineers are. Use the inspiration and ingenuity you exhibited in your classes to propel you in the next chapters of your lives!

We would also like to express our gratitude to the course teaching assistants, Mr. Mohit Agarwal, George Gianoukakis, and Chengwei Zhao, whose hard work and dedication made senior design experience possible.

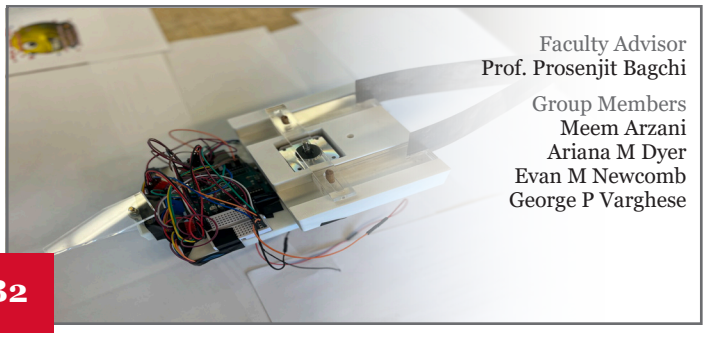
This brochure is a record of your achievements! Congratulations, Class of 2023!

Xi Gu, Ph.D.
Assistant Teaching Professor
Dept. of Mechanical & Aerospace Engineering

Assimina A. Pelegri, Ph.D.
Professor and Chair
Dept. of Mechanical & Aerospace Engineering

DESIGN AND MANUFACTURING PROJECTS

MECHANICAL FISH



Faculty Advisor
Prof. Prosenjit Bagchi

Group Members
Meem Arzani
Ariana M Dyer
Evan M Newcomb
George P Varghese

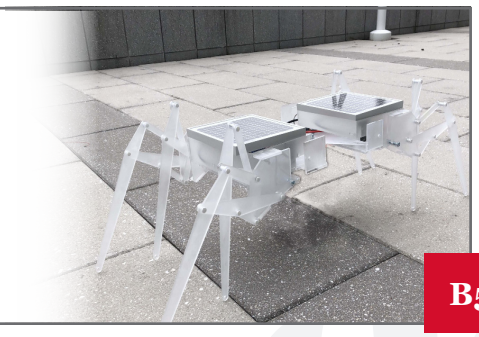
B2

The Mechanical Fish is a robot that uses flexible metal to mimic the body undulations of fish to propagate forward. Biomimicry and sensors may allow for accurate data collection and wildlife observation.

SOLAR POWERED TERRAIN WALKER

Faculty Advisor
Prof. William Bottega

Group Members
James C Barbour
Matthew R Baureko
Tyler F Bilheimer
Antonio F Bu Sha
Joshua J Park
Margaret K Thoresen



B5

This project features a solar powered terrain walker, featuring independently controlled Klann linkage mechanisms as legs, a hinged body design for flexibility, and can navigate over or around uneven terrain.

AEROSPACE DESIGN PROJECT

AIRCRAFT STABILITY AND CONTROL DERIVATIVES

Faculty Advisor
Prof. Haim Baruh

Group Members
Patrick T Delany
Ron R Durosier
David M Goldberg
Goutham Vijayanand
Galileo Wang
James F Ward

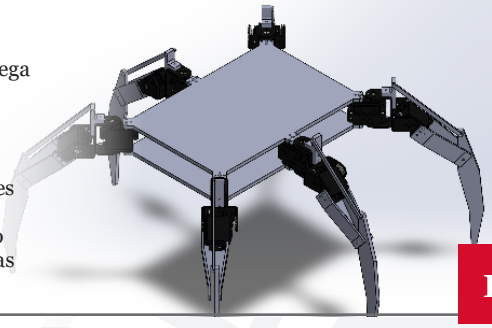
AE B3

Code and telemetry suite designed to measure and calculate the stability and control derivatives of an airplane midflight by flight dynamic equations and a multitude of sensors.

SOLAR POWERED HEXAPOD TERRAIN WALKER

Faculty Advisor
Prof. William Bottega

Group Members
Ryan T Betz
Jenna M Cater
Carlos J Lara-Reyes
Syed M Rizvi
Omar A Sarmiento
Angel M Soto-Veras
Lam Q Tran



B6

Solar Powered Terrain Walker using a hexapod design capable of carrying a payload while traversing difficult terrains as well as negotiating direction changes, all while remaining within an 18-inch maximum height.

WATER SAMPLING AUTONOMOUS DRONE

Faculty Advisor
Prof. Onur Bilgen

Group Members
Xavier Garay
Mohamed Y Haroun
Ruchit Jathania
Michael B Leitner
Zachary M Smolder
Chi Hin Tam

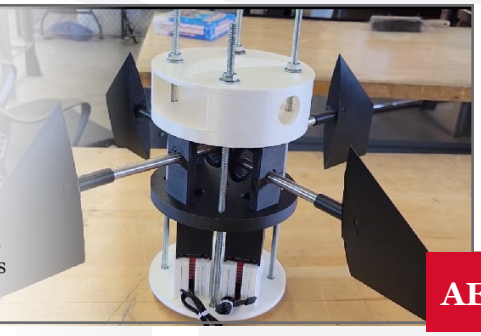
B4

The autonomous Water Sampling Drone is an aerial drone capable of sampling water anywhere. This project is designed for the purpose of aiding people with the collection of water for various experiments.

REACTION CONTROL SYSTEM FOR ROCKET NAVIGATION

Faculty Advisor
Prof. Haim Baruh

Group Members
Aryanna Arcilla
Diana J Chan
Rosetta A Cicero
Elisavet Gallou
Spiro N Klimentos
Francisco A Quiros



AEROSPACE DESIGN PROJECT

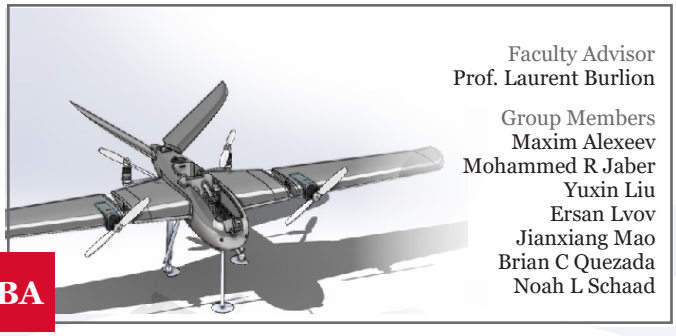
AE B7

A reaction control system and avionic system for rockets that will adjust fin rotation to reduce the effect of pitch and yaw moments to maximize apogee.

DESIGN AND MANUFACTURING PROJECTS

ENERGY EFFICIENT VTOL DRONE

AEROSPACE DESIGN PROJECT



Faculty Advisor
Prof. Laurent Burlion

Group Members
Maxim Alexeev
Mohammed R Jaber
Yuxin Liu
Ersan Lvov
Jianxiang Mao
Brian C Quezada
Noah L Schaad

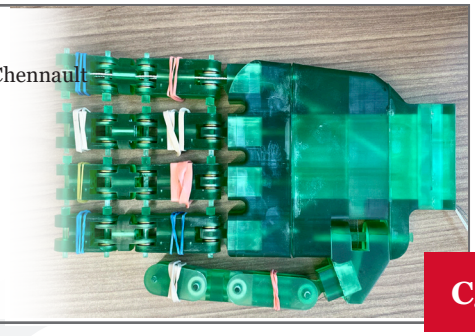
AE BA

A drone that utilizes front tilting wing and rear tilting rotor mechanisms with hover capabilities. The drone has a shifting center of gravity to maximize lift and therefore ensures energy efficiency by maximizing flight time.

BLUETOOTH CONTROLLED AMBIDEXTROUS BIOMECHANICAL HAND

Faculty Advisor
Prof. Kimberly Cook Chennault

Group Members
Terry Chen
Devayani V Cheruvu
Sachin D Fernando
Kirk A Ianni
Lincoln M Roth
Zahra Saeed

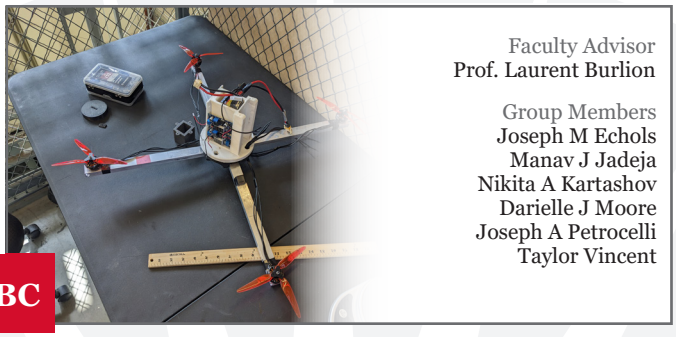


C3

The objective of this Senior Design project is to design a biomechanical hand that will be Bluetooth controlled to hyperextend and hyperflex to become a right or left hand.

SELF LANDING ROCKET

AEROSPACE DESIGN PROJECT



Faculty Advisor
Prof. Laurent Burlion

Group Members
Joseph M Echols
Manav J Jadeja
Nikita A Kartashov
Darielle J Moore
Joseph A Petrocelli
Taylor Vincent

AE BC

A compact Rocket payload that is using a builtin quad-copter drone to automatically stabilize the rocket during descent to carry and land the rocket back to the launch site.

STRATO

Faculty Advisor
Prof. Edward DeMauro

Group Members
Ferdusy Akthar
Isa B Aykit
Ajaydeep S Baghiana
Sai Embar
Jay Kapasiawala
Jaymin Mistry
Devin M Patel
Jairo Rosa
Jack Ryan
Rahil Shaikh
Rajvir Singh
Hamilton P Sujet

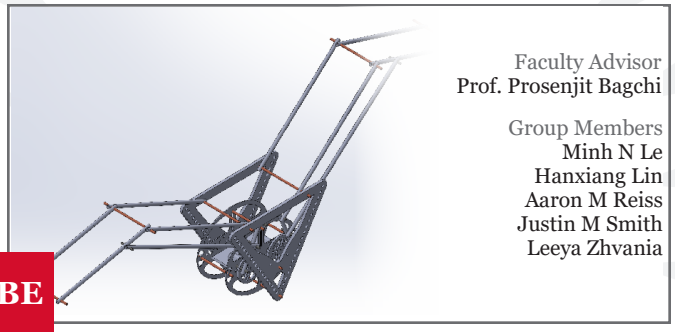
AEROSPACE DESIGN PROJECT

AE D1 & D2

In collaboration with NASA, our group strives to integrate custom-built, modular synthetic jet actuators into an RC plane for research purposes to encourage commercial integration of synthetic jets to improve aircraft performance.

MECHANICAL BIRD

AEROSPACE DESIGN PROJECT



Faculty Advisor
Prof. Prosenjit Bagchi

Group Members
Minh N Le
Hanxiang Lin
Aaron M Reiss
Justin M Smith
Leeya Zhvania

AE BE

We are building a mechanical bird which generates lift by flapping its wings - the design for the bird is based on a seagull.

DESIGN AND TESTING OF A LOW-COST WEATHER MONITORING DRONE

Faculty Advisor
Prof. Francisco Javier Diez

Group Members
Saad Aftab
Nailah T Nguyen
Kacper J Osenkowski
Hrishikesh Sathyanarayan

AEROSPACE DESIGN PROJECT

AE D3

This project involves the development of a hexacopter drone capable of monitoring the weather by measuring atmospheric data, carbon emissions, and VOC gas emissions. Weather data will be analyzed jointly with the Rutgers Meteorological faculty.

DESIGN AND MANUFACTURING PROJECTS

BIO-INSPIRED FLAPPING WING ENERGY GENERATOR

D3

Faculty Advisor
Prof. Mitsunori Denda

Group Members
Kristina S Cheng
Changhao (Justin) Liu
Ben S Snyder
Thomas J Sodano
Christopher J Spada
Edgar C Wilburn

This is a device that generates electrical energy using a mechanism based on the flapping motion of bird wings. Incoming wind causes the wings to flap, which are then connected to a generator.

VRACK

Faculty Advisor
Prof. German Drazer

Group Members
Ihsaam M Al-Shehab
Arnav N Bhavsar
Dubeik Qais
Christina M Hernandez
Christopher Jimenez
Hyeon Woo Kim

D8

VRACK is for those who may have suffered from strokes. Sensorized pedals attached to an exercise bike are used for rehabilitation and muscle coordination improvement. Feedback will be provided through a connected VR component.

BIO-INSPIRED FLAPPING WING ENERGY HARVESTER

D5

Faculty Advisor
Prof. Mitsunori Denda

Group Members
Saeed S Ayesh
Connor J Holm
Sarah A Huppert
Zherui Liu
Thomas A Mortillaro
Ethan A Saguil

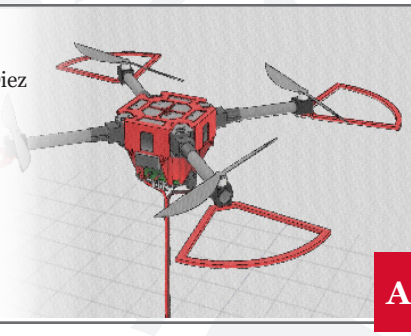
An wing connected to a system and motor that utilizes wind and the motion of flapping to create a quiet, cost efficient, and easier way to harvest usuable energy.

TETHERED DRONE ATMOSPHERIC CONDITION MONITOR

AEROSPACE DESIGN PROJECT

Faculty Advisor
Prof. Francisco Javier Diez

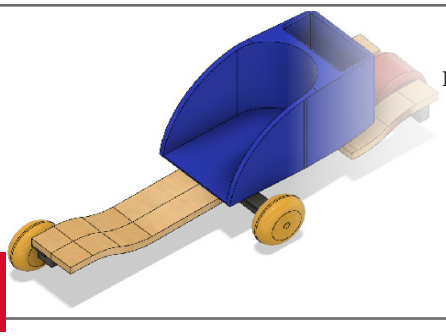
Group Members
Pietro Camiolo
Hagop V Dayermenjian
Meryvn M Keronche
Alexander J Lazeration
Maliha Naeem
Adrian E Wiley



AE D9

The Tethered Drone Atmospheric Condition Monitor is used to measure atmospheric properties to ensure consistent communication in nonideal conditions. This can be used in military applications to foresee any communication interruption due to inclement weather.

POWERED PORTABLE SKATES



D7

Faculty Advisor
Prof. German Drazer

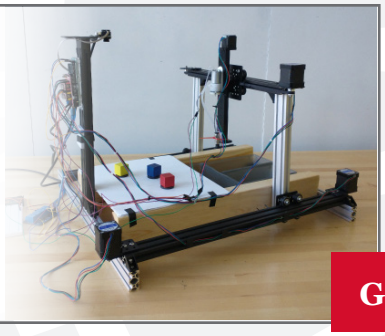
Group Members
Yuliang Chiu
Amit Epstain Ofek
Sean C Piscetelli
Konrad Zawadzki

The electric skate project aims to turn a bothersome walk into a short adventure. The three-wheel design will allow any user to feel stable and secure while they get to where they need to go.

3D AUTOMATED GANTRY FOR SORTING AND ORGANIZATION

Faculty Advisor
Prof. Xi Gu

Group Members
Louis A Bercier
Brian C Catalano
Xinming Han
Sen Li
Justin B Lin
Zachary K Tong
Altin Ukella

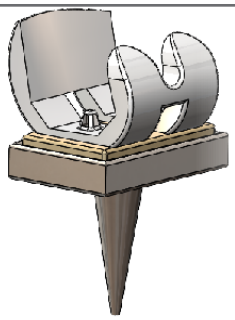


G1

A three axis automated gantry system used to sort items via color into similarly colored receptacles. A camera is used for object detection and the system will run autonomously.

DESIGN AND MANUFACTURING PROJECTS

HYBRID PRINTING - MACHINING OF CUSTOMIZABLE KNEE IMPLANT



Faculty Advisor
Prof. Yuebin Guo

Group Members
Ryan F Bragg
Frank C D'Amico
Jordan T Klingner
Richard J Montoya-Iberos
Kristen N O'Mara
Vincent J Ottaviano

G4

The knee implant components can be customized through SolidWorks regarding size and features to be most applicable to a consumer. The assembly is then manufactured just from printing and machining.

WIND AND SOLAR POWERED WATER ELECTROLYSIS SYSTEM

Faculty Advisor
Prof. Yogesh Jaluria

Group Members
Zachariah C Dellas
Navodya D Divera
Pramith L Divera
Hyeon K Kim
Trivik S Ragha
Mike Theka

J1

Hybrid wind turbine and photovoltaic panel for energy harvesting plus electrolysis tank for hydrogen collection, integrated with electronics for system operation and data collection.

SOLAR-POWERED WATER PURIFIER

Faculty Advisor
Prof. Zhixiong Guo

Group Members
Alexandra M Alvarez
Thomas A Brandt
Joseph A Maimone
Gianfranco G Martone
Noman Saeed
Cameron N Withum

G5

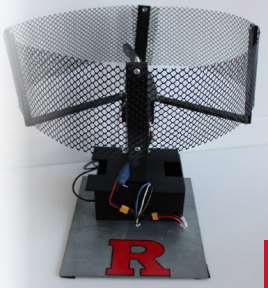
The Solar-Powered Water Purifier is a device which utilizes a fresnel lens to harness solar energy and in turn powers a water purification process that boils contaminated water to generate and condense purified steam.

RUTGERS THRUST STAND (RTS)

AEROSPACE DESIGN PROJECT

Faculty Advisor
Prof. Doyle D. Knight

Group Members
Christopher T Eden
Devin C Lewis
Armand G Longo
Shady M Maximoss
Brian J McNicholas
Siddharth Sambath Ramkumar



AE K1

The Rutgers Thrust Stand (RTS) is a tabletop thrust stand that displays the thrust, input electric power, and RPM produced by RC motors and propellers via LabVIEW. It measures thrusts between 5-20 Newtons.

SOLAR-POWERED VACCINE COOLER

Faculty Advisor
Prof. Zhixiong Guo

Group Members
Austin J Fox
Justin M Fox
Steven D Ike
Thomas E Manahan
Terence J O'Regan
Constantino Sacasa

G6

A portable solar-powered cooler that will store vaccinations or other refrigerated medications by using a thermoelectric module powered by a solar panel and a long-life battery for consistent temperature control, day and night.

DESIGN OF MODEL AIRCRAFT ELECTRIC ENGINE THRUST STAND

Faculty Advisor
Prof. Doyle D. Knight

Group Members
Sean T Eoon
David R Garner
Angel M Jimenez
Abigaelle E Nelson
Khaled M Ramadan

K1

Tabletop Electric Engine Thrust Stand capable of measuring thrust, voltage, current and revolutions per minute of a motor and drone propeller.

DESIGN AND MANUFACTURING PROJECTS

ELASTOMERIC COMPOSITE 3D PRINTER

L1

Faculty Advisor
Prof. Jennifer Lynch-Branzoi

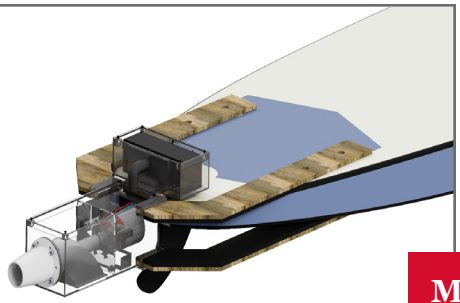
Group Members
Xuedong Fan
Nicole I Fraidenraich
Jacqueline C Lee
Haolin Li
Ian P Lumkong
Siddharth Swaminathan

The project goal is to modify a standard FDM 3D printer to be able to print elastomeric composites. This is accomplished by implementing a pump system that will transport the liquid elastomer material.

DETACHABLE PROPULSION UNIT FOR SURFBOARDS

Faculty Advisor
Prof. Aaron Mazzeo

Group Members
Shane M Dean
Jadin O Eafrati
Kyle R Egan
Alex T Kiledjian
James J Krall
Christopher F Lopez
Aidan M Newbury



M2

The goal of this project is to create a device that will allow a surfer to confidently catch waves without the limitations of an inadequate physical fitness required for paddling.

3D PRINTING OF THERMOPLASTIC PELLETS

L3

Faculty Advisor
Prof. Jennifer Lynch-Branzoi

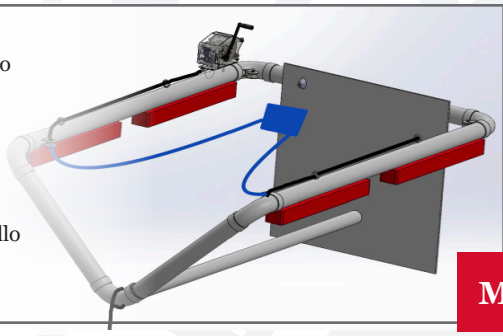
Group Members
Enoch J Hu
Justin S Lo
Patrick D O'Brien
Marc Raimondi
Gabrielle J Ross
Devin J Stoltz

Building a custom extruder on a Lulzbot Mini capable of printing from thermoplastic pellets rather than filament. Allows for researchers to more easily test novel materials using the flexibility of 3D printing.

SWELLSHOT

Faculty Advisor
Prof. Aaron Mazzeo

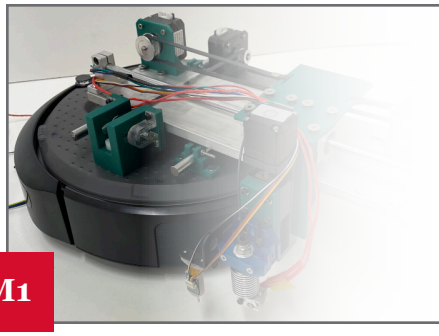
Group Members
Zayn A Butt
Jaiden E David
Dhruv A Patel
Raj S Patel
Steven Perez-Badillo
Brent J Shin
Michael T Starpoli



M3

The SwellShot is a stationary floating surfboard propulsion system to help surfers of any proficiency to safely catch waves. This single-user mechanical system utilizes elastic cables to propel surfers to catch waves at different distances.

WIRELESS MOBILE 3D PRINTING ROBOT



M1

Faculty Advisor
Prof. Rajiv Malhotra

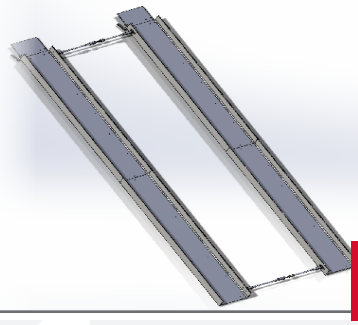
Group Members
Kian Agrawala
Sameer M Howe
Arad Maghouli
Evan A Nastarowicz
Jonathan G Ramos
Adeline N Ripberger

A small 3D printing system is mounted on a mobile base, which can be controlled wirelessly to print structures larger than itself. This robot is self-contained and compatible with popular robotics tools such as ROS.

TRANSPORTABLE WHEELCHAIR RAMP

Faculty Advisor
Prof. Andrew Norris

Group Members
Daniel A Feliciano
Josh Holschuh
Shiqi (Angie) Ma
Mohit B Mehta
Christian J Padilla
Thomas J Peterman
Giancarlo Pisciotta

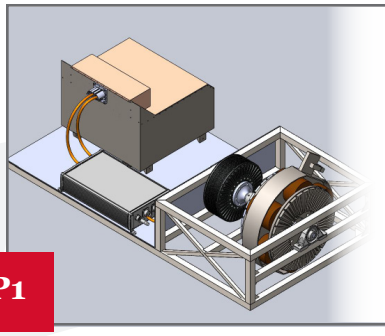


N1

The transportable wheelchair ramp is designed to be a lightweight, flexible, and user-friendly tool that allows those in wheelchairs to ascend steps up to 15" in height where permanent ramps are unavailable.

DESIGN AND MANUFACTURING PROJECTS

RFR POWERTRAIN DYNO



P1

Faculty Advisor
Prof. Assimina Pelegri

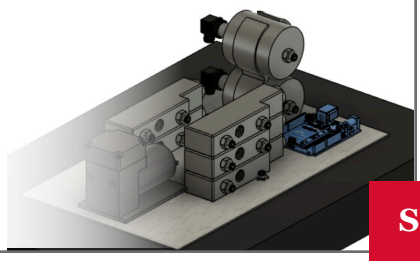
Group Members
Thomas Bennardo
Paul A Bikker
Paul A delVechio
Henry F Fechhelm
Dmytro Govdan
Erik Robles
Neel G Shah
Faiza Sikanar
Karolis Sniras

To increase the performance ceiling, the group is creating a dynamometer to measure the torque output for the Rutgers Formula Racing's motor the Emrax 208.

PRESSURE AND VACUUM DEVICE FOR DNA VACCINE DELIVERY

Faculty Advisor
Prof. Jerry Shan

Group Members
Matthew J Krinzman
Stephen D Lee
Aaron A Lombardi
Christopher R Mason
Rathman V Paluri
Kevin J Tulloch



S1

Design, build, and test a cuff which can alternately provide pressure and vacuum to spots on the arm. In order to enhance transdermal delivery of large molecules, including DNA vaccines, into cells.

DISPENSING PUMP

P2

Faculty Advisor
Prof. Xi Gu

Industry Advisor
Barbara Porter

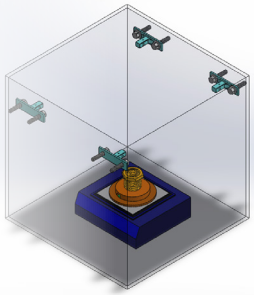
Group Members
Joy M Best
Gabriela A Cortes
Daniel S Kraftmann
Estanli A Mora-Vargas
Carolyn Q Nguyen
Nnadozie B Obi

Analyzing issues of current dispense pump designs to redesign a pump that addresses issue such as clogging, product residue, and inconsistent product pumped.

SELF-LIMITING ELECTROSPRAY DEPOSITION CHAMBER

Faculty Advisor
Prof. Jonathan Singer

Group Members
Justin C Duran
Mohammed Y Ibrahim
Jack F McAleavey
Cassandra M McGowan
Edgar S Moreno



S2

Our system coats objects using Self-Limiting Electrospray Deposition, ensuring a uniform coating on even the most complex geometries. To improve the system, the spray holder and object platform, will be reworked.

SOLAR POWERED STEAM GENERATOR

R1

Faculty Advisor
Prof. Todd Rossi

Group Members
Mark A Brenner
Jeffrey S Brodhecker
Jeremy L Christiansen
Jianghong Gu
Michael T Kirwan
Ethan A Nobre
Connor J O'Leary

The solar powered steam generator takes water inside a vacuum tube, introduces solar heat, causing the water to take on a gaseous state to power turbine.

PERSONAL PORTABLE AIR CONDITIONING UNIT

Faculty Advisor
Prof. Stephen Tse

Group Members
Anthony C Bognar
Kyler W Brodzinski
Sekou A Camara
Zakaria Chahiedine
Angel A Fabian
Matthew N Gallardo

T1

Design and build a functional personal portable AC unit that is battery powered and uses water as heat exhaustion. This product can be used in small spaces such as cubicles or student desks.

DESIGN AND MANUFACTURING PROJECTS

HIGH STRENGTH, LIGHT WEIGHT CYLINDAR PRESSURE VESSEL WITH FIBER REINFORCED COMPOSITES

AEROSPACE DESIGN PROJECT

AE W2

Faculty Advisor
Prof. George Weng

Group Members
Leandro A Andres
Liam Elhadad
Ben Manaois
Andrew M Murrello
Koki Takahashi
Maxwell J Toll

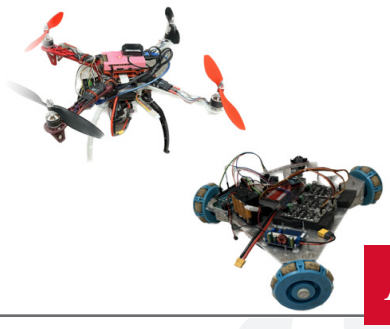
Type 4 Carbon fiber cylindrical pressure vessel which is about 3.5 times lighter than that metallic tanks. Manufacture through the wet winding process prioritizing minimal thickness of carbon fiber layering.

A MULTI-DIMENSIONAL FLEET OF INTELLIGENT MOBILE PLANTS FOR UNKNOWN TERRITORY EXPLORATION

AEROSPACE DESIGN PROJECT

Faculty Advisor
Prof. Qingze Zou

Group Members
Emily M Briones
Kevin Gomez
Jedediah Handerhan
Xavier H Lee
Kyle J Montgomery
Juhi P Patel
Yusuf T Sharaf

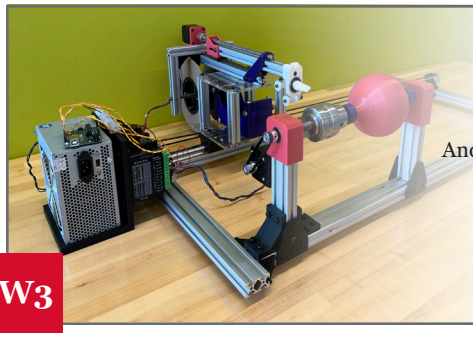


AE Z1

The goal of this project is to provide an autonomous, communicative system consisting of multiple ground robots and a singular aerial drone that can locate, travel to, and confirm resources that are essential for survival.

HIGH STRENGTH, LIGHT WEIGHT SPHERICAL PRESSURE VESSEL WITH FIBER REINFORCED COMPOSITES

AEROSPACE DESIGN PROJECT

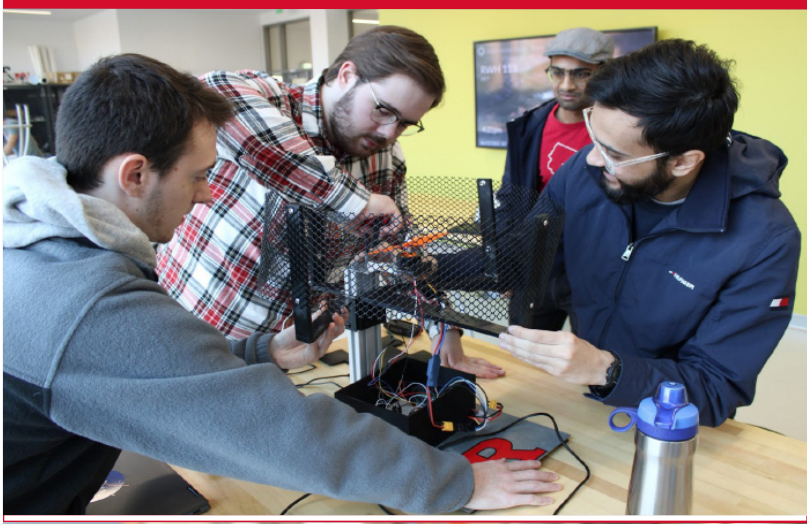


AE W3

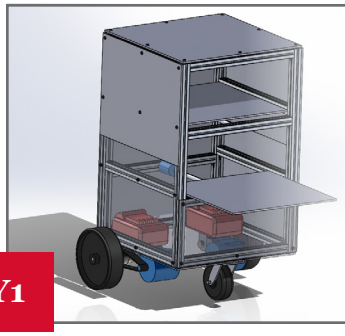
Faculty Advisor
Prof. George Weng

Group Members
Andrea Sophia N David
Matthew Y Huang
William J Moore
Omar Mougharbel
Daniel A Velasquez
Andrew M Wellnitz

Our team designed a 4-axis filament winding machine to create high strength composite pressure vessels. The machine interfaces with a Matlab applet which helps users design and visualize the wrapping process based on their requirements.



THE C.H.A.D. BOT



Y1

Faculty Advisor
Prof. Jingang Yi

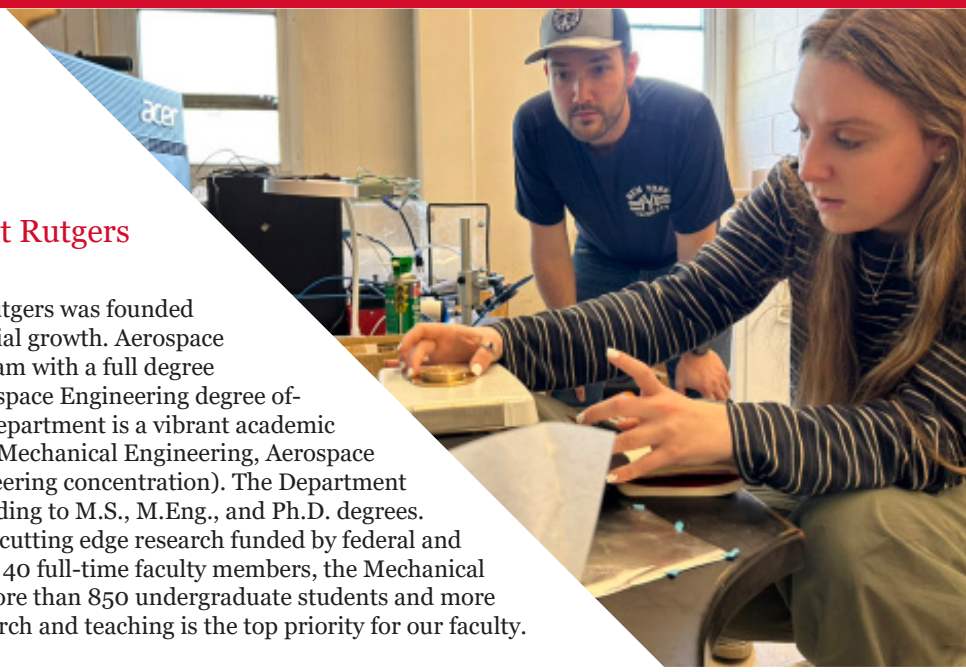
Group Members
Quinlan P Hood
Carolyn M Hornak
Theodore Hsi
Alexander P Kim
Matthew T Knorr

An autonomously navigating delivery customer service robot intended for settings such as a hospital or a restaurant to ease the workload of employees.

Cover Photos (All group members listed left to right):

Front top left: Pietro Camiolo, Maliha Naeem, Meryvn Keronche, Alexander Lazeration, Hagop Dayermenjian, Adrian Wiley (AE-D9)
Front bottom left: Devin Stoltz (L3)
Front right: Aryanna Arcilla (AE-B7)
Front inside top: Jaymin Mistry, Jairo Rosa, Isa Aykit, Devin Patel, Ferdusy Akthar, Jay Kapasiawala, Sai Embar, Rahil Shaikh (AE-D1&D2)
Front inside bottom: Tyler Bilheimer, Margaret Thoresen, Matthew Baureko, James Barbour, Antonio Bu Sha, Joshua Park (B5)
Back inside across top: Brian McNicholas, Christopher Eden, Siddharth Sambath Ramkumar, Shady Maximoss (AE-K1)
Back inside across bottom: George Varghese (B2)
Back inside top left: Alex Kiledjia, Aidan Newbury (M2)
Back inside top right: David Garner, Khaled Ramadan, Abigaelle Nelson (K1)
Back inside middle left: Brian Catalano (G1)
Back inside middle right: Saad Aftab (AE-D3)
Back inside bottom: Andrea Sophia David, Omar Mougharbel, Andrew Wellnitz, William Moore, Matthew Huang, Daniel Velasquez (AE-W3)
Back: Justin Duran, Cassandra McGowan (S2)

RUTGERS
Mechanical and Aerospace Engineering



Mechanical & Aerospace Engineering at Rutgers

The Department of Mechanical Engineering at Rutgers was founded in 1908 with a focus on driving the country's industrial growth. Aerospace Engineering was added in 1965 as a certificate program with a full degree program established in 2015. It is now the only Aerospace Engineering degree offered among New Jersey's public universities. The Department is a vibrant academic community offering three undergraduate degrees in Mechanical Engineering, Aerospace Engineering, and Applied Science (Packaging Engineering concentration). The Department has state of the art laboratories used for research leading to M.S., M.Eng., and Ph.D. degrees. Undergraduate and graduate students participate in cutting edge research funded by federal and state agencies, and industrial partners. With close to 40 full-time faculty members, the Mechanical and Aerospace Engineering Department educates more than 850 undergraduate students and more than 150 graduate students. Excellence in both research and teaching is the top priority for our faculty.

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