Mechanical and Aerospace Engineering
2019 Design and Manufacturing Expo
May 9, 2019

RUTGERS
School of Engineering

RUTGERS
Mechanical and Aerospace Engineering

Course Coordinators	Prof. Assimina A. Pelegri Prof. Xi Gu
Teaching Assistants	Jeet Panchal Matthew Kelsten Michael Dexter Mukund Joshi Omar Jumaah
Senior Project Administrator Design Specialists	John Petrowski Paul Pickard Dr. Basily Basily
Seminar Speakers	Mr. Alejandro Ruiz *Rutgers REHS* Dr. Jerry Shan *Rutgers MAE* Mr. John Laucius *Merck & Co.* Mr. Gary Minkoff *Rutgers Business School* Mr. Ken Johnson *Lockheed Martin (Ret.)* Mr. Merrill Edmonds *Rutgers MAE* Dr. Richard Dool *Rutgers School of Communication and Information* Dr. Joel Garrett *CSWI - Specialty Chemicals*

NOTE FROM THE CHAIR

The Mechanical and Aerospace Engineering Department is a vibrant academic community offering two undergraduate degrees in Mechanical Engineering and Aerospace Engineering, in addition to graduate/advanced programs leading to MS, MEng and PhD degrees. Our 30+ full-time faculty members educate more than 780 undergraduate and 160 graduate students. Our Department is one of the largest and oldest units in the School of Engineering, having been founded in 1908. Today, our programs rank on the top 50 Graduate Engineering Programs in the nation, according to U.S. News and World Report. Our exciting and multidisciplinary research portfolio is advancing research in a variety of scientific and technological areas, including nanostructures, autonomous robotics, electrohydrodynamics, fluid interactions, energy science, and advanced materials.

Our community of students, faculty, alumni, and industry partners are devoted to collaborative work at the highest standards of research and innovation. Every faculty member is dedicated to helping our students achieve success through teaching excellence and an exciting array of research projects. Students have access to a wide range of classes that train them in the core principles of mechanical and aerospace engineering. They have the opportunity to participate in research projects as undergraduates, allowing them to gain experience in real-world applications comparable to research conducted by industry.

Excellence in teaching is a priority for our faculty members who take seriously their role as educators, training students to be problem solvers and innovators. Our faculty has achieved distinction among their peers and as fellows of professional engineering societies, including the American Society of Mechanical Engineers (ASME), American Physical Society (APS), Acoustical Society of America (ASA), and American Academy of Mechanics (AAM).

We invite you to join our Mechanical and Aerospace Engineering community in our sustained efforts to advance societal needs through the scientific and technological discovery & innovation, design, and manufacturing.

Alberto Cuitiño, Ph.D.
Professor and Chair
Department of Mechanical and Aerospace Engineering

NOTE FROM THE COORDINATOR

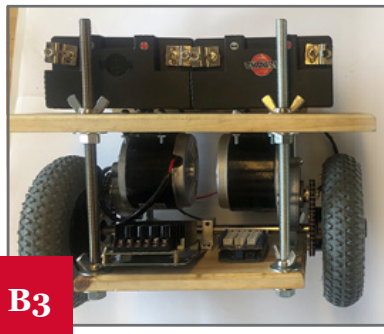
Dear students, parents, and friends,

I would like to take this opportunity to welcome you to the Mechanical and Aerospace Engineering Department at Rutgers! Presented in the next few pages is the challenge that every Rutgers MAE undergraduate has to face, the yearly Design and Manufacturing Project. All classroom learning is translated to real-life problems as small groups of students work under faculty members to design and build an operational device that accomplishes a preset list of goals over the span of two semesters in their final year. Students compete with their projects in April during Rutgers Day in a public setting and are judged by academic and industrial experts. During these projects, students have the opportunity to work with industry members as well as faculty, 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. A key experience is our partnership with the Rutgers Business School faculty whose students collaborate with ours and prepare business plans to address the business component of design and engineering innovation. This provides a unique opportunity to students to work in a multidisciplinary entrepreneurial environment that is distinct to our department. Take your time to read through our projects and celebrate with us the innovativeness, entrepreneurship, and resourcefulness of our young engineers!

Assimina A. Pelegri, Ph.D.
Professor and Undergradate Program Director
Department of Mechanical and Aerospace Engineering

DESIGN AND MANUFACTURING PROJECTS

WHEELCHAIR CONVERSION KIT



B3

Faculty Advisor
Prof. Haim Baruh

Group Members
Denyson Dukievicz
Michael D Keim
Daniel V Laudien
Romi N Patel
Adam Swierski
Patrick Tan

Goal of our project is to create a kit that will convert a conventional manual wheelchair into an electric wheelchair. In doing so we will create a cheaper alternative to electric wheelchairs on the market. This will force wheelchair manufacturers to create more affordable solutions to meet demand.

WIND WALKER

Faculty Advisor
Prof. William J. Bottega

Group Members
Hamidullah Assadullah
Evan M Baldachino
Wanjun Chao
Ahmet Kasapoglu
David U Ndukwe
Qilin Ren

B9

The mission of designing a structure such as the Windwalker is a complex challenge. Weight, height, material compatibility, gear ratios, turbine lengths, leg modifications, friction, and stability all need to be evaluated in order to accomplish the task of developing a Windwalker that will be capable of moving in a linear formation while carrying a weight of 1 lb. In addition, a budget of $650 cannot be exceeded.

DRONES IN TANDEM

B4

Faculty Advisor
Prof. Haim Baruh

Group Members
Edwin Castillo
Nancy A Contreras
Nithya A Iyer
Kush Patel
Connor W Ross
Nicholas P Younger

The purpose of this project to successfully build drones that fly in tandem. The first drone will be human controlled, and the second drone autonomously follows the first drone using computer vision and image tracking. The drones can be outfitted with cameras to survey large areas of land, with potential applications including forest fires, search and rescue, and other emergency services.

MULTI-MODE HYBRID DELIVERY SYSTEM

Faculty Advisor
Prof. Onur Bilgen

Group Members
Syed Y Hyder
Lovjoat Singh
Shuohuang Yang
Xiaolin Zhong
Nicholas R Bonini
Morgan L Taylor
Shivani V Topiwala
Jessica S Tuazon
Nathan Yang

BA - BB

The MMHDS utilizes a fixed-wing balsawood aircraft with onboard docking system to carry a multirotor drone long distances. The maneuverability of the drone is used to efficiently bring a package to the customer's doorstep.

SOLAR/THERMAL SOARING UAV

AEROSPACE DESIGN PROJECT

AE B1 - B5

Faculty Advisor
Prof. Xiaoli Bai

Group Members
Dimitrius V Cugini
Petar Dimitrijevic
Carl Victor L Salazar
Brendan T Galvin
Christopher B Hegeman
Aris C Karapiperis
Oleksander V Krul
Jeremy D Muniz
Daniel Kelly
Patrick D Zazzaro

Fixed-wing UAV which utilizes solar energy and an onboard thermal detection systems, to limit its power consummation and extend its overall flight time. As well as an automated navigation system built into the flight controller.

NOVEL QUADCOPTER WITH SOLID-STATE ROTORS

AEROSPACE DESIGN PROJECT

Faculty Advisor
Prof. Onur Bilgen

Group Members
Shah Bano
Calvin Dobrin
Dhaval J Shah
Kasey V Shneiderovsky
Ravi D Mevawala
Sharuk Ozair
Akshat A Patki
William J Schwab
Bharg J Shah
Youstina Tawadrous

AE B2 - BC

The Solid-State Rotor project focuses on the stability and control aspect of a quadcopter drone. By implemented piezoelectric material on the propellers and modifying flight controller signals, the propellers' camber can be altered.

DESIGN AND MANUFACTURING PROJECTS

WIND WALKER

Faculty Advisor
Prof. William J. Bottega

Group Members
James A Cronin
Abdelghani Khyat
Daniel R Siberine
Brandon D Smith
Daniel T Woods
Joseph E Zevits

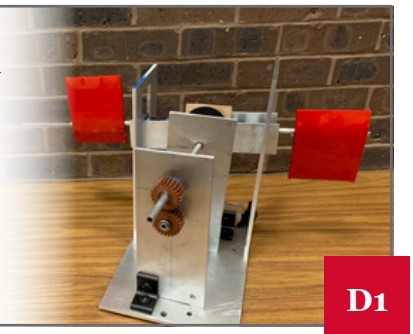
BW

Due to the inevitable decay of utilizing non-renewable energy sources, renewable energy is starting to become the new normal to power devices. With our device it will utilize only wind energy to move. Which can then be used as a prototype for future designs.

FLAPPING WING ENERGY HARVESTER

Faculty Advisor
Prof. Mitsunori (Mitch) Denda

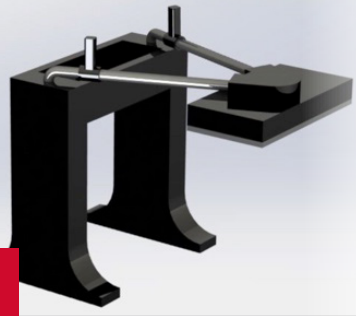
Group Members
Matthew R Costa
Matthew E Demetris
Katrina F Oliveira
Harsh Pimplikar
Aman S Ramnani
Joseph A Rezkalla
Mike R Vivar



D1

Climate change is a priority issue. Unlike windmills or solar farms, this bio-inspired flapping wing energy harvester is a machine designed to harvest wind energy for lower wind speeds. This model can be scaled up to provide energy for residential/commercial applications in order to reduce fossil fuel consumption.

BENCH PRESS NECK GUARD



Faculty Advisor
Prof. Xi Gu

Group Members
Harshitha V Gadangi
Thomas E Garrity
Samuel E Gruskiewicz
Kyle Devine
Patrick M Mccarthy

C3

The bench press neck guard is a safety device that will protect a weightlifter's neck from serious injury if a barbell were to fall onto the user. The device is made of a steel bars, plastic lumber, and a latch system to attach itself to the bench. The steel bars will withstand most of the impact and will be the heaviest portion of the device. The lightweight plastic lumber makes the device more portable, so users can carry it with them when they go to the gym.

FLAPPING WING WIND ENERGY HARVESTER

Faculty Advisor
Prof. Mitsunori (Mitch) Denda

Group Members
Jack J Ayre
Kevin N Blum
Thomas P Heller
Nicholas H Iaconelli
Benjamin R Kane
Evan K Pearce
Christopher A Ragusa
Kevin Vozza

D2

A Common practice for Engineers is to mimic the complexities of nature itself. This is highlighted in the BESTO, a bio-inspired flapping wing wind energy harvester. While typically unwanted in aspects of aeronautics, wing tip vortices can be utilized immensely for the purpose of energy harvesting. The BESTO uses these recent discoveries to increase efficiency and ultimately gain a leg up on other common wind-energy hardware.

POWER BIKE

Faculty Advisor
Prof. Kimberly Cook-Chennault
Prof. Michael Caggiano*

Group Members
Kristin E Miyamoto
Che Wan Muhammad Amiradzim
Vedant Shah
Furkan Gungor

C4

The electric bike uses regenerative braking to generate electricity and store it into an on-board battery. It has a hub motor that acts as the generator and would be used to also drive the bike.

* Department of Electrical and Computer Engineering

BAT DRONE

AEROSPACE DESIGN PROJECT

Faculty Advisor
Prof. F. Javier Diez-Garias

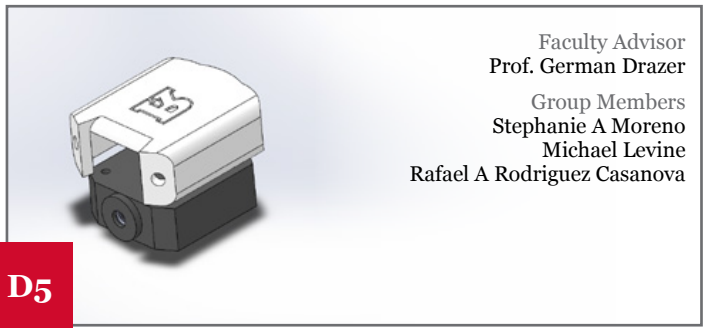
Group Members
Andrew V Barcia
Alexandre S Brito
Priyanka Malhotra
Keith S Myers
Nastassja Lopez
Michael Yang
Hassan Azmat
Mitchell D Locke

AE D3 - D3

The drone population is increasing with a need for a better way to maintain multiple drones in a single docking station. Drones will be able to be released and fly on command from docking station.

DESIGN AND MANUFACTURING PROJECTS

VRACK



Faculty Advisor
Prof. German Drazer

Group Members
Stephanie A Moreno
Michael Levine
Rafael A Rodriguez Casanova

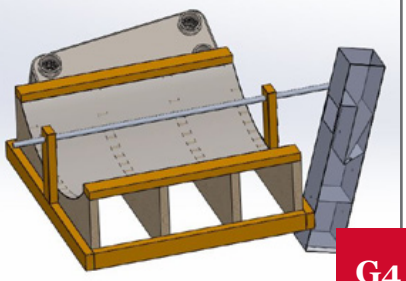
D5

The VRACK is a virtual reality rehabilition cycle for post stroke patients. The pedals will measure the force each leg produces and show the corresponding forces in a VR environment. This will provide real-time feedback to post stroke patients.

SUSTAINABLE SALTWATER DISTILLER

Faculty Advisor
Prof. Zhixiong (James) Guo

Group Members
Volodymyr Busko
Aidan T Callahan
Stephen A Christos
Sohan Ganguli
Mariusz E Sur-
owaniec
Meng Yu
Jianning Zhu



G4

The primary function of the Sustainable Distiller is to desalinate saltwater for potable use. It uses a parabolic trough solar collector and a mechanical flow metering system to perform this process.

AEROSPACE DESIGN PROJECT

TILT-WING ELECTRIC VTOL

Faculty Advisor
Prof. Edward DeMauro

Group Members
Drew M Becza
Cassidy M Gonzalez-Morabito
Adeela Khatoon
Ayush Luthra
Dhruvil S Patel
Edgard Sanchez
Joshua S Schwartz
Imrhankhan Shajahan
Abhishek Chopra
Rut P Lineswala
Michael R Mahoney
Maya Nayak
Anthony M Pellicori
Alexander Sanducu
Abhay Srinivas

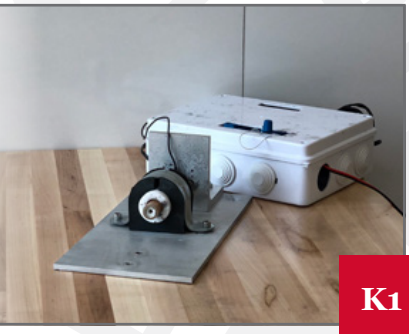
AE D1 - D7

Design and manufacture prototype of a personalized electric V/STOL. It consists of four rotors attached to a tilting wing. The rotors provide vertical thrust for lift-off, once airborne the vehicle will transfer into forward flight.

MODEL ROCKET THRUST STAND

Faculty Advisor
Prof. Doyle D. Knight

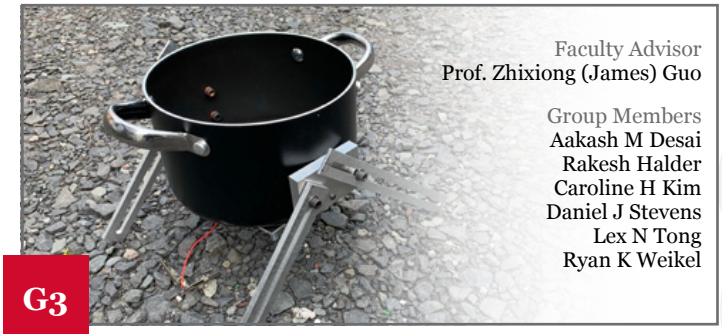
Group Members
Sanjana R Bhat
Chidozie M Buruzie
Ivan Garcia
Supraja Naresh Kumar
Stephanie P Tu



K1

Our group is designing and fabricating a model rocket thrust stand, that utilizes a button load cell. The load cell captures thrust in the x-axis. This data is then transferred to an Arduino that can wirelessly send it to the computer. While capturing data, it is presented on a LabView interface. The data can be saved from LabView and sent to anyone. Additionally, our model rocket thrust stand is highly manufacturable, thus making it simple yet effective.

HYBRID SOLAR-THERMOELECTRIC GENERATOR



Faculty Advisor
Prof. Zhixiong (James) Guo

Group Members
Aakash M Desai
Rakesh Halder
Caroline H Kim
Daniel J Stevens
Lex N Tong
Ryan K Weikel

G3

Our project is a dual functional solar and thermoelectric generator. Its main purpose is to serve individuals who find themselves in situations without access to a reliable or any source of electricity, including those living in developing countries, who have lost power during natural disasters, or individuals who are camping. Our generator will allow one to charge or power low-power devices such as a laptop or smartphone.

PAPER 3D PRINTER

Faculty Advisor
Prof. Howon Lee

Group Members
Harrison J Campopiano
Allison C Choi
Brandon R Manalo
Madeleine R Modugno
Jessica H Strauss
Olivia C Tahiri

L1

This 3D printer produces an object through selective deposition lamination using recycled paper as the medium. Each layer of paper is applied glue, heated and compressed, and then cut into the desired shape.

DESIGN AND MANUFACTURING PROJECTS

3D-RE

Faculty Advisor
Prof. Howon Lee

Group Members
Teresa H Franz
Regina B Lyons
Laura B Mckinley
April L Patko
Baran Yesilyurt

L2

This 3D printer uses recycled plastic bottles as the filament in an FDM printer. This process starts with cutting plastic bottles into thin ribbons with an automated device cuts the plastic into one long, flat strip. This filament will then be fed into a heated conical tube that will transform the geometry of the strip into one that is cylindrical. Once the geometry is transferred, the plastic will be fed into extruder on a cartesian 3D printer and printed with the standard FDM method.

ORTHOTIC POWER GRASPER GLOVE

Faculty Advisor
Prof. Aaron Mazzeo

Group Members
Gregory W Geueke
Ariana F Murray
Michelle Fialkoff
Alexander V Burke
Mark K Orzeszko

M1

Our project utilizes a hybrid design of a cable system, as well as pneumatically actuated inflatable bladders to assist in the opening and closing of a users hand. This process aids in the repetitive motion physical therapy exercises used to strengthen the grasp of people with sustained issues of motor control such as stroke patients.

CONVEYOR BELT BASED SORTER

Faculty Advisor
Prof. Hao Lin

Group Members
Christian A Davidson
Josephine Hong
Jonathan Malke
Keith F Schroeder
Carmen S Troia

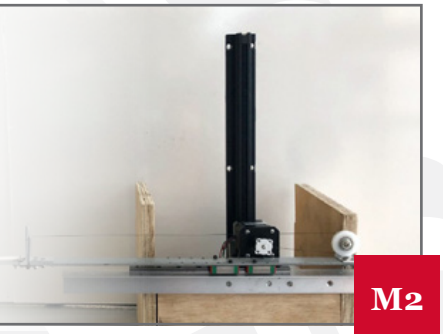
L3

Our conveyor belt sorting mechanism will contribute to creating a more efficient way of recycling metal scraps. The design utilizes chicaning in the organizing process and color detecting sensors in the sorting process.

CABLE-BASED FEEDING ASSISTANT

Faculty Advisor
Prof. Aaron Mazzeo

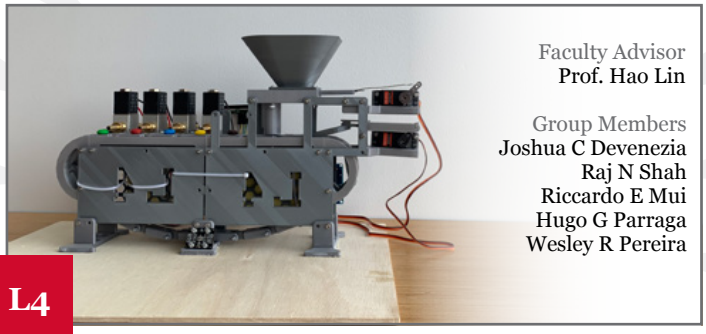
Group Members
Clara A Bakhoum
Frank Cofone
Marina S Daniel
Justin L Hrbek
Bishoy Said
George Youssef



M2

The cable-based feeding assistant is a robot that aids in feeding those who do not have full use of their arms. It is made up of two arms and a wrist joint that are run by a cable-based pulley system powered by stepper motors. The purpose of building a robot that is cable-based is to improve safety, control over the movements, and decrease the inertia by limiting movements.

PNEUMATIC SORTER



Faculty Advisor
Prof. Hao Lin

Group Members
Joshua C Devenezia
Raj N Shah
Riccardo E Mui
Hugo G Parraga
Wesley R Pereira

L4

A conveyor belt based system which receives items with close geometric homogeneity and distinguishes them non invasively by topical finish using a sensor. The characterized items are carried by the conveyor belt to be separated into bins by pneumatic actuators responding to an Arduino signal.

ECS (EVAPORATIVE COOLING SYSTEM)

Faculty Advisor
Prof. Michael R. Muller

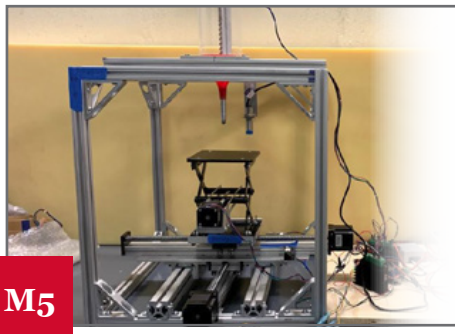
Group Members
Christopher B Bodei
Thomas L Donohue
Sarah A Landis
Michelle M Talavera
Brandon Eng
Kaitlin O Taylor
Rohan Walia
Kevin M Wolf

M3

Our project was to design an evaporative-cooling system that can retrofit onto a pre-installed solar panel in order to increase the power output of the system. The idea is that the system would utilize water to cool down the panels.

DESIGN AND MANUFACTURING PROJECTS

3D DUST PRINTER



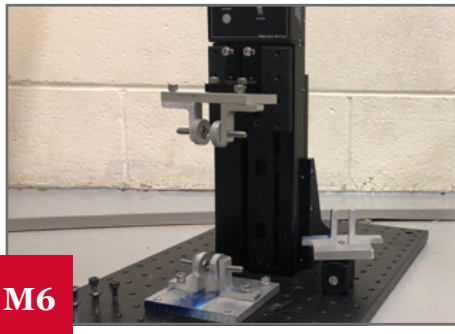
Faculty Advisor
Prof. Rajiv Malhotra

Group Members
Michael J Conti
Frank A Iattarelli
Ibrahim M Morsy
Jainil Patel
Jonathan E Reiss
Samuel M Santiago

M5

Inspired by challenges in the construction of sustainable shelters in disaster stricken areas, the innovative 3D Dust Printer was developed to provide a way to construct structurally stable construction materials with limited resources. The printer operates by extruding a mix of local particulate materials and a resin, while simultaneously passing a UV light overhead to cure each layer.

TESTING CONDUCTIVE INTERCONNECTS ON FABRICS AND POLYMERS UNDER MECHANICAL DEFORMATION FOR FLEXIBLE ELECTRONICS.



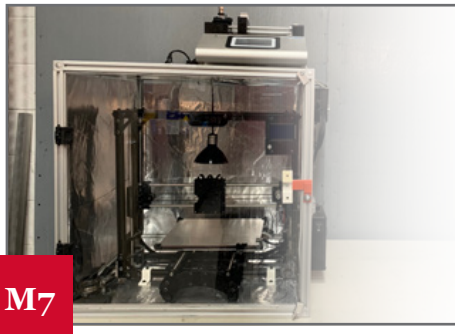
Faculty Advisor
Prof. Rajiv Malhotra

Group Members
Mark S Haddad
Carlos A Rico
Kyle B Smith
Jarrett E Tyler

M6

An all-in-one bending, tensional, and torsional material tester, to perform fatige testing and resistance analysis on flexible polymer samples embedded with conductive metallic interconnects which allow the polymer to conduct a current.

3-D ADDITIVE MANUFACTURING



Faculty Advisor
Prof. Aaron Mazzeo

Group Members
Christopher Antony
Andrew R Bozzell
Nolan Choi
Ansuman Das
Nicholas A Mcginnis
Elizabeth U Reynes
Jonah Varughese

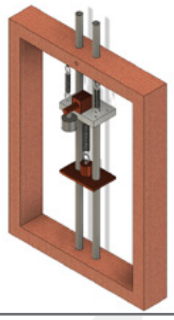
M7

Our goal is to create a 3-D printer that prints using a two part epoxy mixture. Our epoxy printer will be embedded with continuous fibers, providing objects with stronger mechanical properties and high temperature resistance.

VIBRATIONAL MASS DAMPER MODEL

Faculty Advisor
Prof. Andrew Norris

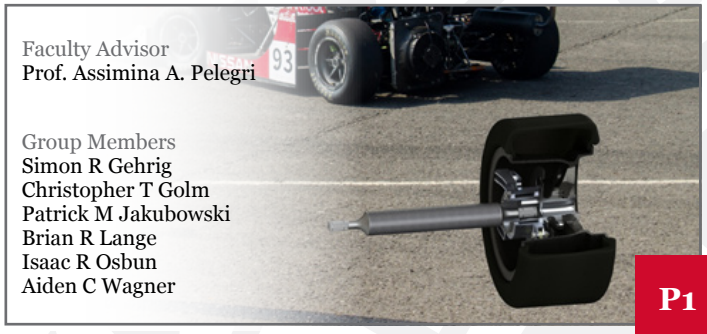
Group Members
Josmar Adames
Ike I Azubuike
Kevin P Callaghan
Bayron T Jaramillo
Trevis Leung
Samuel Kim



N1

Construction of mass-spring model with motor and rotating mass that causes erratic shaking. That vibrational energy is counteracted or reduced by mass-spring damper attached to the model.

CARBON FIBER DRIVESHAFT



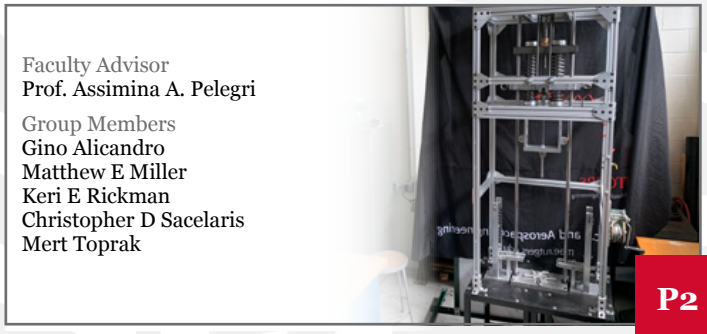
Faculty Advisor
Prof. Assimina A. Pelegri

Group Members
Simon R Gehrig
Christopher T Golm
Patrick M Jakubowski
Brian R Lange
Isaac R Osbun
Aiden C Wagner

P1

The CFRP driveshaft, designed, manufactured, and implemented by mechanical engineering students on the Rutgers FormulaSAE team was developed as a lightweight composite solution to replace steel counterparts using a composite tube bonded to steel attachments.

IMPACT TESTER



Faculty Advisor
Prof. Assimina A. Pelegri

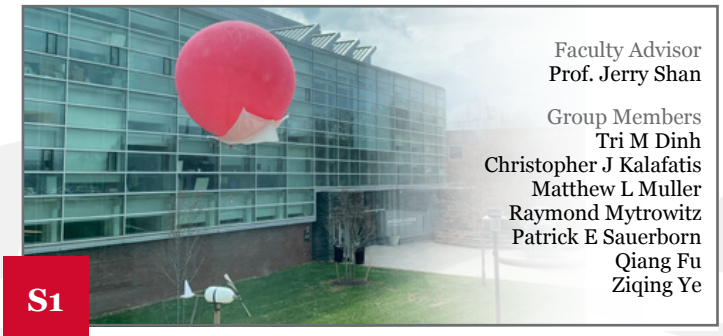
Group Members
Gino Alicandro
Matthew E Miller
Keri E Rickman
Christopher D Sacelaris
Mert Toprak

P2

Our project focuses on the improvement of an impact tester built last year through design and fabrication efforts aimed at increasing durability and functionality as well as the addition of instrumentation to record test data.

DESIGN AND MANUFACTURING PROJECTS

AIRCRAFT ENERGY HARVESTOR



Faculty Advisor
Prof. Jerry Shan

Group Members
Tri M Dinh
Christopher J Kalafatis
Matthew L Muller
Raymond Mytrowitz
Patrick E Sauerborn
Qiang Fu
Ziqing Ye

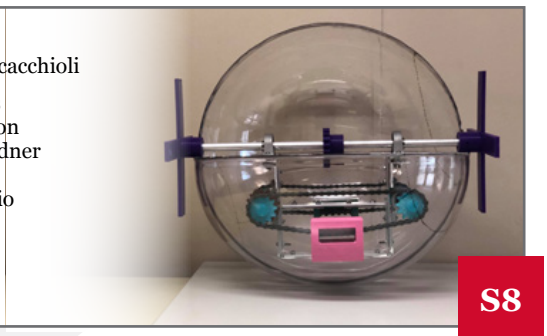
S1

The Aircraft Energy Harvester is an air deployed turbine system aimed to exploit high altitude wind speeds in order to produce renewable energy. This system is a clean alternative to portable gas-powered generators.

BAS 1

Faculty Advisor
Prof. Annalisa Scacchioli

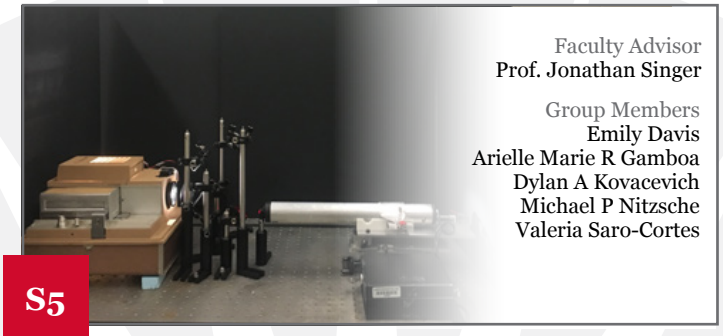
Group Members
Alexander Y Biron
Lawrence E Gardner
John J Jung
Robert W Servilio



S8

Our project is a spherical robot that is capable of quickly rolling, stopping, and changing direction. Our ideal environment is a relatively smooth surface at a maximum incline/decline of 5 degrees relative to balance.

VARIABLE POLYMER LENS FOR METAL 3D PRINTING



Faculty Advisor
Prof. Jonathan Singer

Group Members
Emily Davis
Arielle Marie R Gamboa
Dylan A Kovacevich
Michael P Nitzsche
Valeria Saro-Cortes

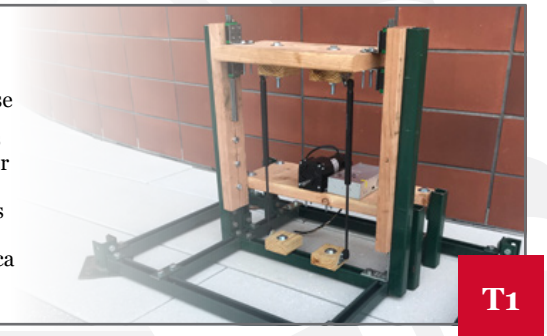
S5

We aim to increase throughput of metal 3D printing by sintering entire printing layers instantaneously. This is achieved by reflecting the desired image, generated via thermocapillary shearing, onto the metal powder bed.

EQUESTRIAN SIMULATOR

Faculty Advisor
Prof. Stephen Tse

Group Members
Jonathan Walker
David Hou
Cameron Barnes
Jordan Barnes
Anthony J Savoca



T1

The Equestrian Simulator recreates the three standard dressage gaits: walk, trot, and canter. While the main objective is to train horseback riders, this simulator will also function as a tool for physical therapy.

AUTONOMOUS 1/10TH SCALE RACE CAR

Faculty Advisor
Prof. Annalisa Scacchioli

Group Members
Mychael D Bryan
Arun B Kingan
Samuel H Lee
Robert T Randolph
Gabriel J Sanchez
Jun Sun You

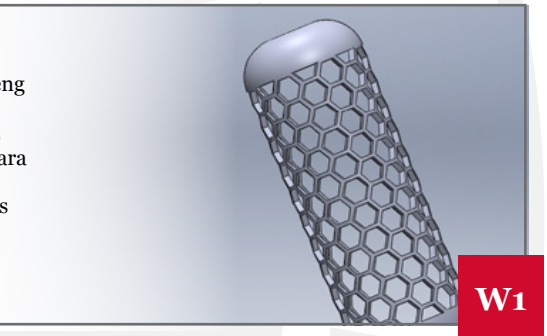
S7

This project designs and programs an RC rover to navigate an obstacle course autonomously. The car uses data inputted from a LIDAR sensor and is built to compete in the annual F1Tenth Autonomous Racing Competition.

HIGH STRENGTH FIBER-REINFORCED CYLINDRICAL PRESSURE VESSEL

Faculty Advisor
Prof. George Weng

Group Members
Alexander Guevara
Mark T Hanna
Matthew S Powis
Denny Zheng



W1

A light weight carbon fibered cylindrical pressure vessel with high strength and durability attributes. Designed to withstand and hold various pressures based on application.

DESIGN AND MANUFACTURING PROJECTS

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

Faculty Advisor
Prof. George Weng

Group Members
Borjan Aritonovski
Zachary T Cirincione
Leonidas Katsikis
Elan Kilimnik
Jenna M Murphy

W2

A lightweight, high-strength, composite overwrapped spherical pressure vessel made from a carbon fiber and epoxy matrix shell and a rubber interior bladder that is useful in aerospace applications.

AN UAV-UGV-INTEGRATED SYSTEM FOR A SCHOOL OF MOVING PLANTS IN 3-D

Faculty Advisor
Prof. Qingze Zou

Group Members
Fan Bo
Haochong Chen
Yuchen Li
Mahbubul I Shawrav
Jiachen Zhang
Te Zhang

Z3

This project is aimed to let UAVs and UGVs work successfully by motor control and also work automatically. We want to let UAVs and UGVs hold plants when they are working to detect unknown places. This way is more effective than just using data to reflect the conditions of the searched places, because the condition to survive and grow of plants is more persuasive to show whether the places are safe for living or not.

AUTONOMOUS GRINDER

Faculty Advisor
Prof. Jingang Yi

Group Members
Jefferson N Cevallos-Melendez
Isaac N Dresdner
Franz S Riverodelaguarda
Jiacheng Xiong

Y1

Autonomous Grinder that implements dry grinding by using a single grinding disc to grind and polish concrete floors. A vacuum is attached to the grinder to retrieve all the dust produced by the grinder.

UNIVERSAL THERMAL IMAGING KIT

Faculty Advisor
Prof. Alberto Cuitiño

Group Members
Matt Chianese
Matthew Crane
Anthony Schell
Pratik Shah
Michael Waespy
Christopher Yap

AEROSPACE DESIGN PROJECT

AE C1

This project aims to create a low cost, universal, thermal imaging kit to attach to any drone. With this kit, a drone will gain the capability to stream thermal images to the user. The 3-D printed kit will hold a thermal camera for imaging, a raspberry pi for saving the video feed, a transmitter to send the video feed to a user, a GPS transmitter to record location, and a battery to power these components.

SELF-STABILIZING SINGLE TRACK VEHICLE

Faculty Advisor
Prof. Jingang Yi

Group Members
Hussein Agiz
Benjamin M Carey
Patrycja Laskowska
Khurram M Memon
Eric Na

Y2

Self-stabilizing single-track bicycle capable of maneuvering through narrow spaces and carrying payload. Ideal for situations where a bulky machine, drone, or person would not be efficient.

PROJECT HUMMINGBIRD

Faculty Advisor
Prof. F. Javier Diez-Garias

Group Members
Lincoln L Black
Sean T Dougherty
Andrew R Ferraro
Elijah B Lippe
Mandev Singh
Jonathan R Tumalle

AEROSPACE DESIGN PROJECT

AE D2

This long range search and rescue platform has combined the hovering capabilities of a quadcopter with the high efficiency of an airplane to acheive a powerful combination boasting the fastest transition time in the industry.

ROCKET ENGINE THRUST STAND

AEROSPACE DESIGN PROJECT

AE K1

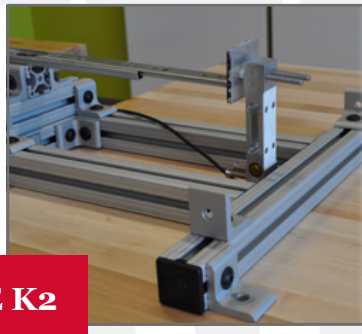
Faculty Advisor
Prof. Doyle D. Knight

Group Members
Andrew J Duffer
Parth D Joshi
Andrew J Krynicki
Partth A Laad
Samuel E Tucker

The Rocket Engine Thrust Stand accurately and safely measures the thrust of model rocket engines. It will be used as a laboratory experiment to provide future engineering students hands on experience with rocket propulsion.

MODEL ROCKET ENGINE THRUST STAND

AEROSPACE DESIGN PROJECT



AE K2

Faculty Advisor
Prof. Doyle D. Knight

Group Members
Andrey Gruzinov
Shahzaib Hussain
Ibad R Khokhar
James P Pereirashorey
Kaitlyn A Welch

A stand capable of measuring 5-50 N of thrust from various model rocket engines with an accuracy of ±5%. The data is wirelessly transmitted to the computer interface where it can be graphed and analyzed.

Collaboration with the Rutgers Business School

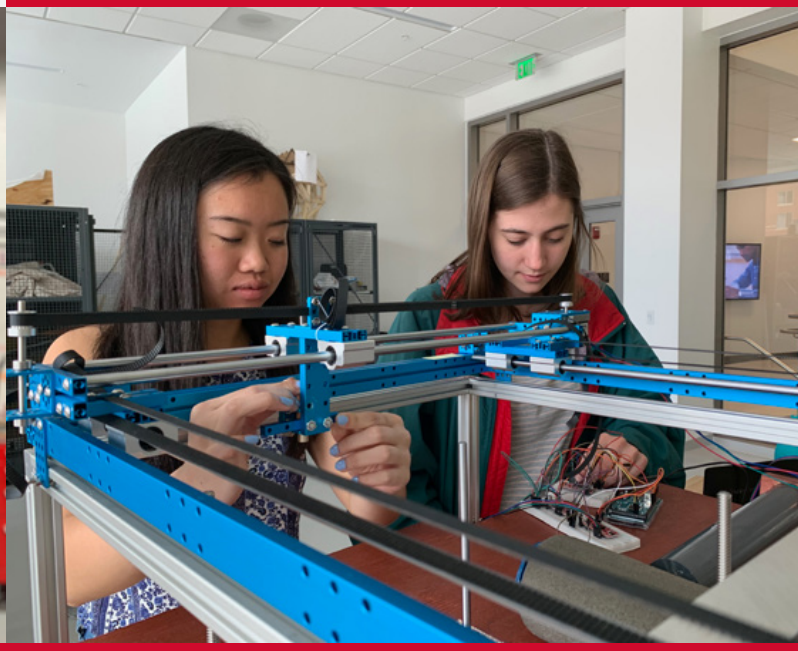
We would like to thank the instruction team for the Tech Ventures course offered by the Rutgers Business School for their support throughout our collaboration with them.

Instructor: Prof. Gary Minkoff
Teaching Assistant: Victoria Tsarkova

Collaborating Business Students

Fall Semester	*Spring Semester*
Aditya Makhijani	Ben Sosidka
Aria Fairman	Christopher McGinnis
Andrew Reid	Daniel Park
Andrew Walker	Emanuel Pantaleon
Anthony Topol	Hitesh Kalluru
David Harten	Irene Yanlin Yang
Ghali Mazzouri	Jesse Thompson
Jacob Elliott	Jill Krutyansky
Joseph Araman	Kaige Zhu
Michael Remy	Magdalena Lozinski
Muhammed Syed	Neil Thompson
Philip Aquilina	Nicholas Grimando
Samantha Cajilig	Nick Chrystal
Scott Wills	Nico Blasucci
Sean Benson	Peter Giampietro
Umair Masood	Ryan Stiesi
Zachary Persichett	Seth Goldberg
	Suhani Baranwal

Cover Photos
All group members listed left to right, top to bottom.
Front top: Gregory Geueke (M1)
Front bottom: Nathan Yang (BA-BB), Shivani Topiwala (BA-BB), Teresa Franz (L2), Laura McKinley (L2), Valeria Saro-Cortes (S5)
Front inside: Regina Lyons (L2)
Back inside left: John Jung (S8), Robert Servilio (S8)
Back inside right: Allison Choi (L1), Madeleine Modugno (L1)
Back: Christopher Sacelaris (P2)



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 offers both a standard Mechanical Engineering curriculum leading to a BS degree in Mechanical Engineering with optional Aerospace Engineering or Energy Systems concentrations, as well as a BS degree in Aerospace Engineering with an optional Energy Systems concentration. The Department has state of the art laboratories used for research leading to MS, MEng, and PhD degrees. Undergraduate and graduate students participate in cutting edge research funded by federal and state agencies, and industrial partners. With more than 30 full-time faculty members, the Mechanical and Aerospace Engineering Department educates more than 780 undergraduate students and more than 200 graduate students. Excellence in both research and teaching is the top priority for our faculty.

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