University of Virginia

-Major's Night-

Mechanical Engineering

UNIVERSITY of VIRGINIA

ENGINEERING

Department of Mechanical and Aerospace Engineering

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UNIVERSITY of VIRGINIA ENGINEERING

Contents

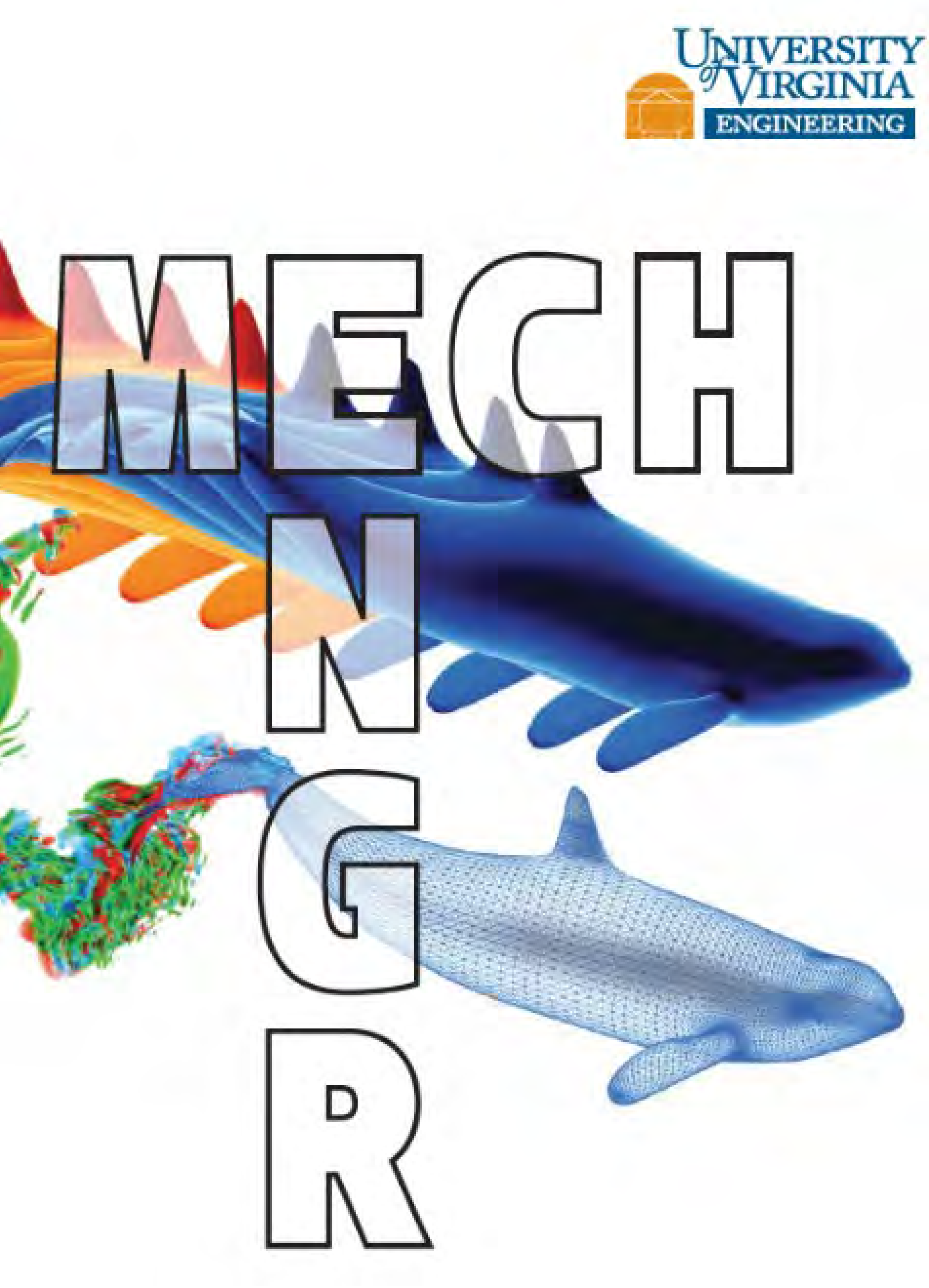
UVa Researchers Engineer Safety for the Football Field (wmra.org)

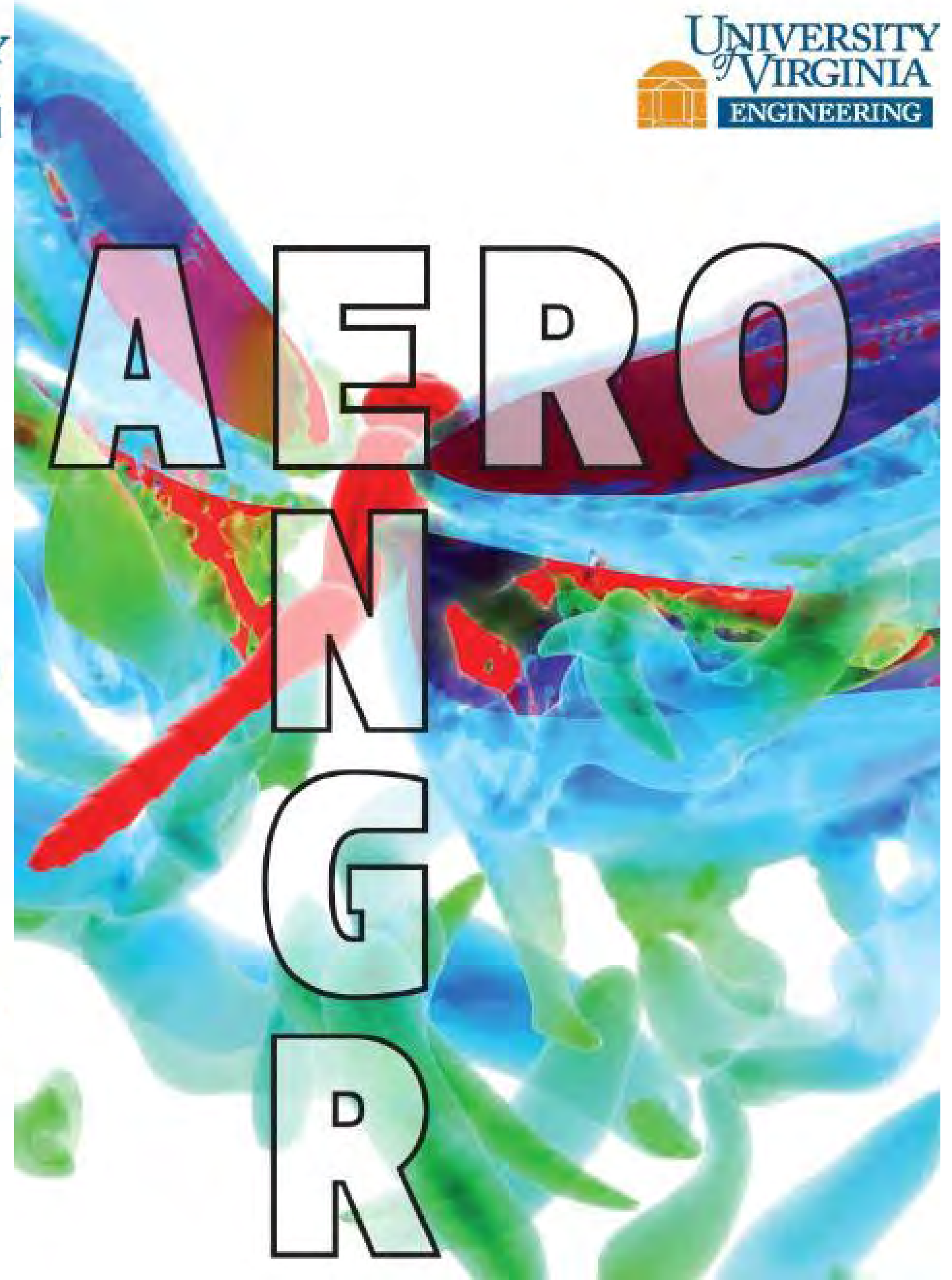
Richard Kent

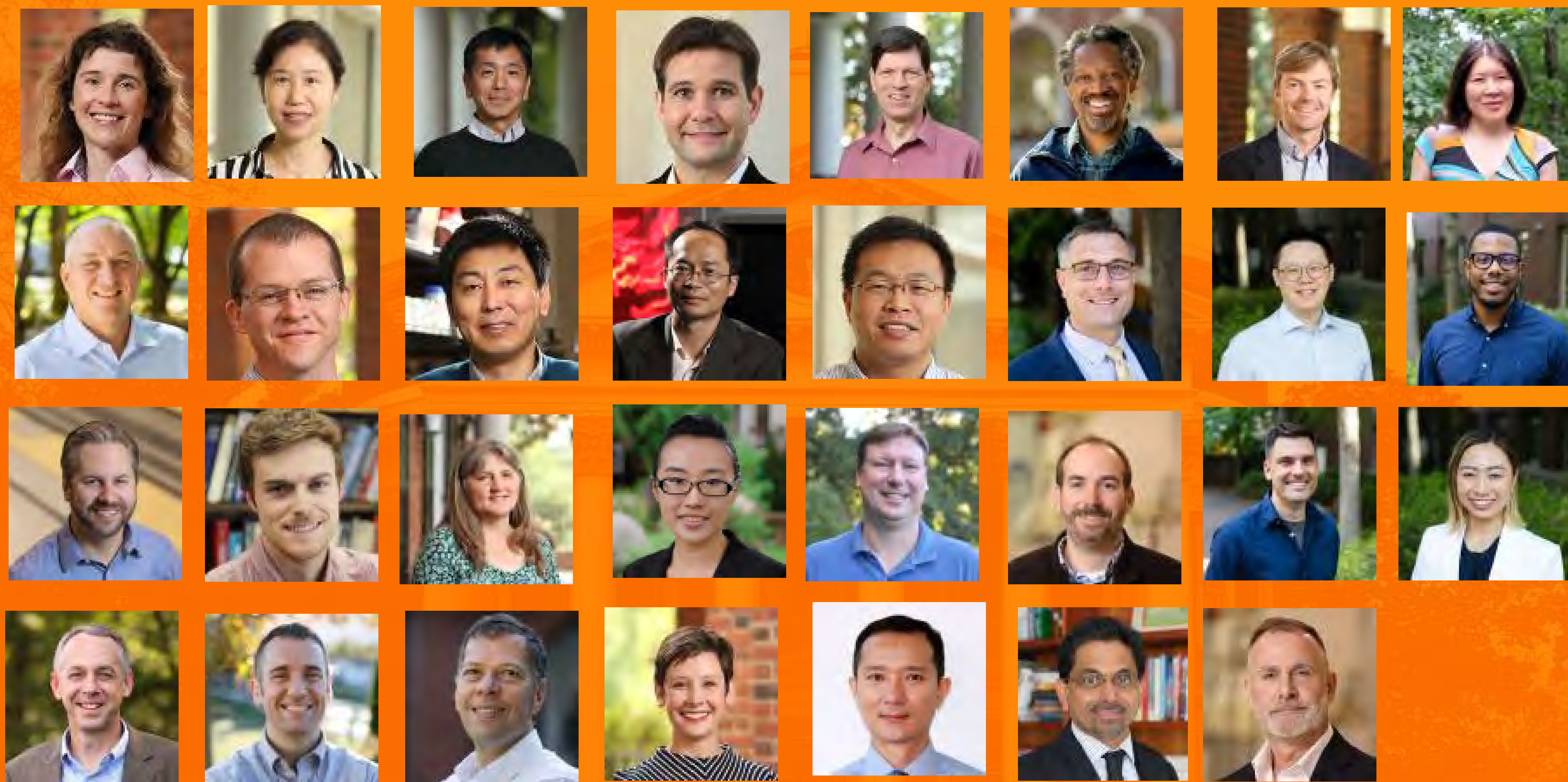
MAE Department Chair

Co-founder for UVA Center for Applied Biomechanics (CAB)

Awesome Combination of 2 Majors in 1 Department







>30 faculty members in MAE

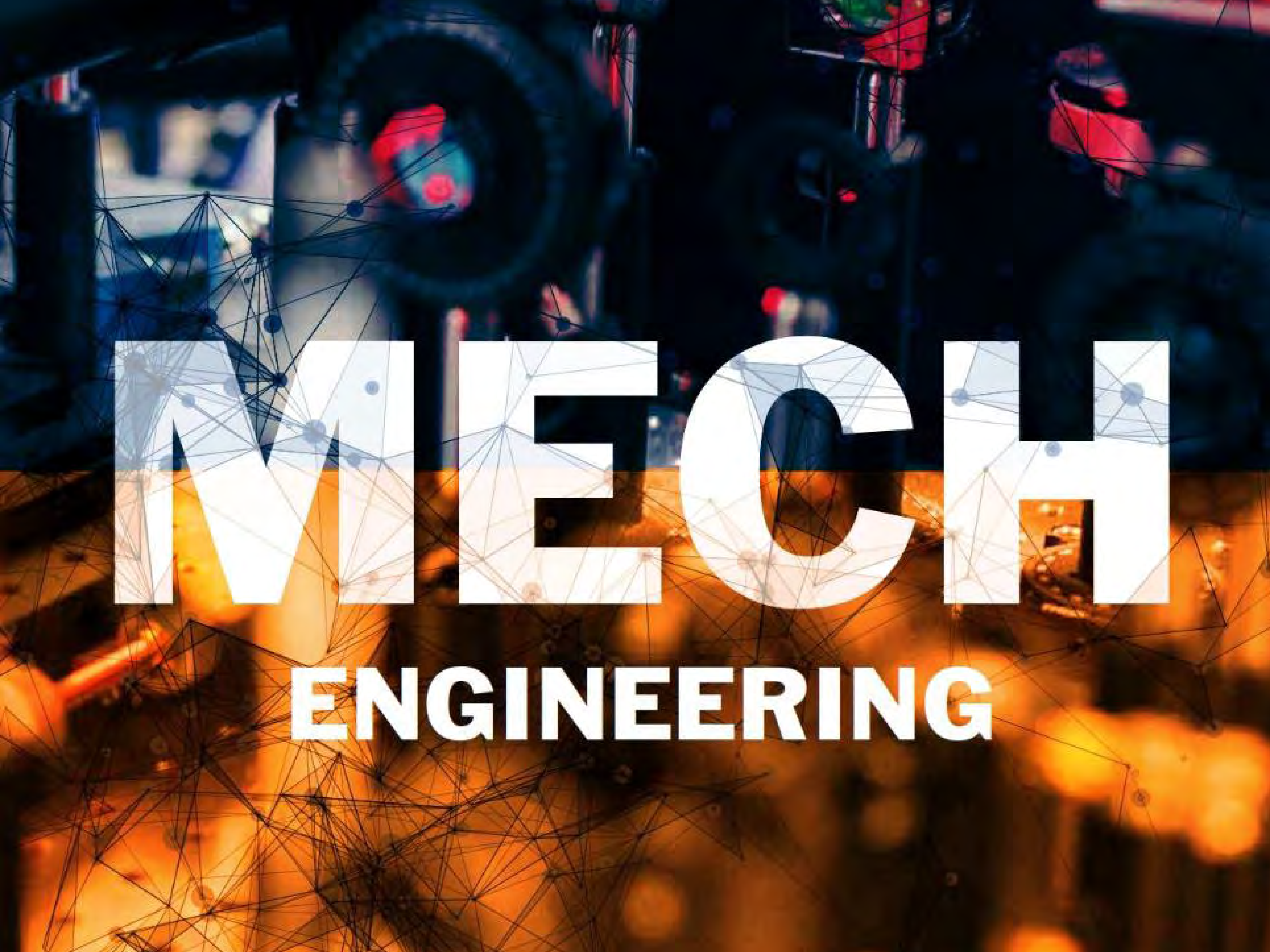
Continuous growth in the years to come


Safety for Athletes
Featured in the Super Bowl!

World-Class Energy Faculty Featured at the White House!

Underwater Autonomous Systems


Invited to Capitol Hill


MECH
ENGINEERING

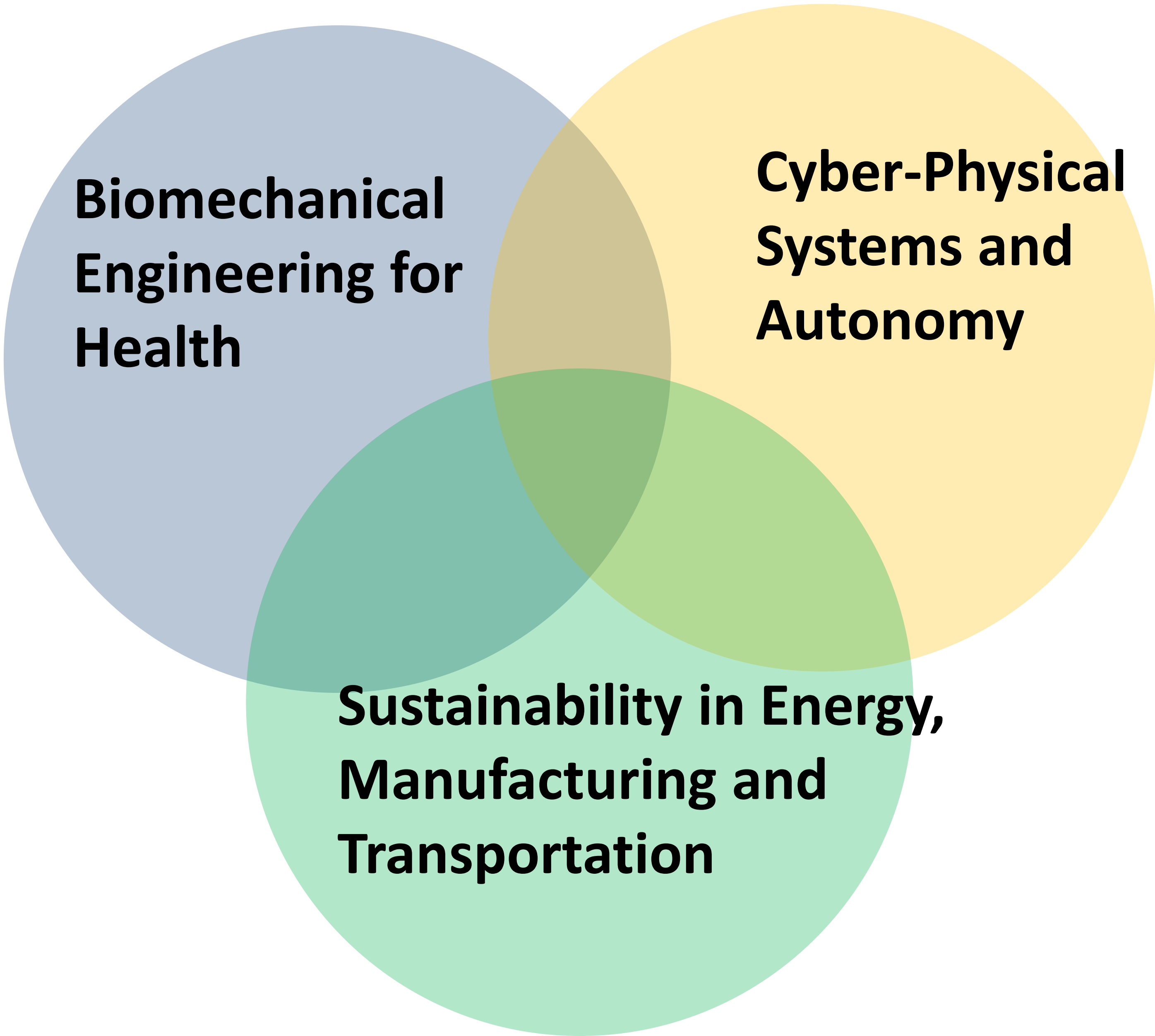
Mission

- To educate undergraduate and graduate students to apply the principles of the physical sciences, mathematics and engineering to solve challenging multidisciplinary problems;

- To empower the students to teach themselves new knowledge and ideas to solve problems far beyond the factual boundaries of their education;

- To develop socially-conscious, informed, articulate, and transformative leaders of the profession, academia, and society as a whole.

ME Faculty Research Tracks at a Glance



RESEARCH & DISCOVERY

Feds Turn to UVA Engineering To Help Reverse Auto Fatality Trends

By Wende Whitman, wende@virginia.edu • December 14, 2023

(Illustration by Emily Faith Morgan, University Communications)

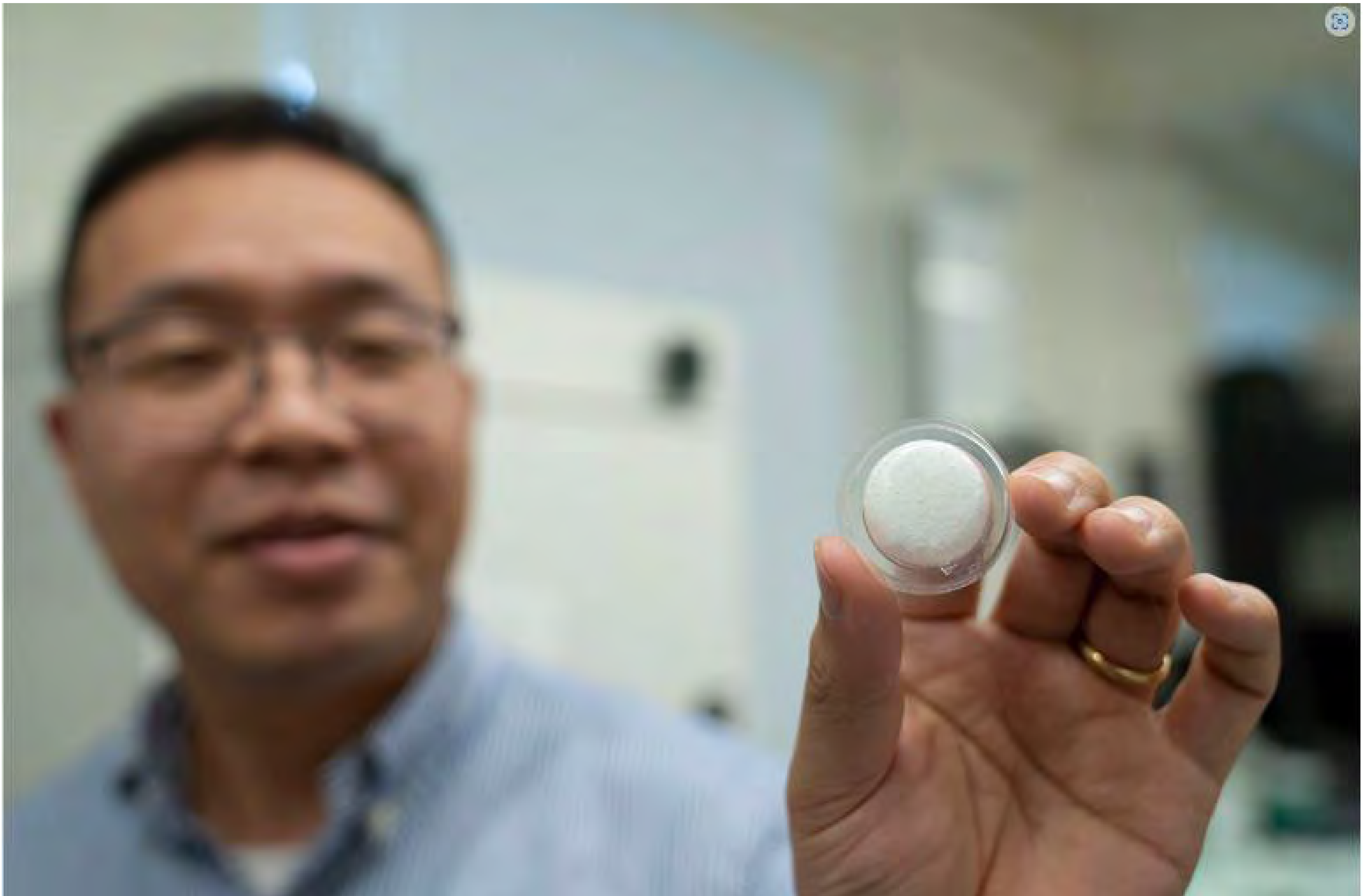
UVA Develops a 'Google Earth' View of Bone — With an Eye Toward Disease Prevention

September 24, 2024

By Eric Williamson | eaw2s@virginia.edu

RESEARCH & DISCOVERY

Discovery Could Make Football Much Safer



Engineering professor Baoxing Xu shows off a sample of his liquid nanofoam system, a padding design that could be a game-changer for football players – and many others. (Photo by Dan Addison, University Communications)

RESEARCH & DISCOVERY

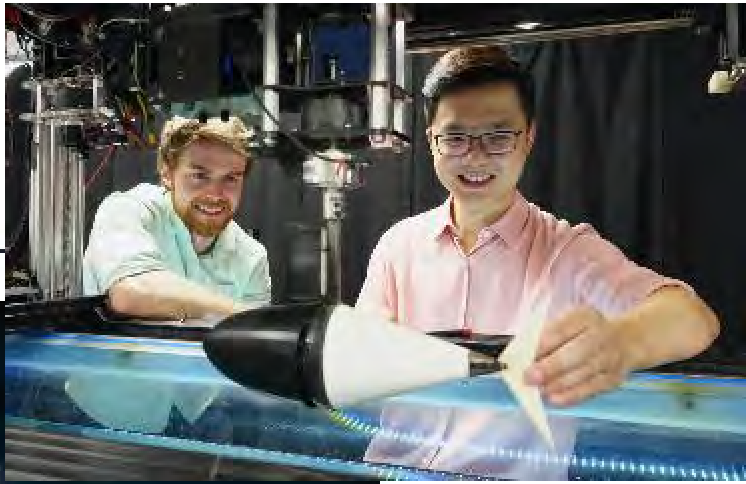
Mechanical Engineers Develop Coronavirus Decontamination Robot

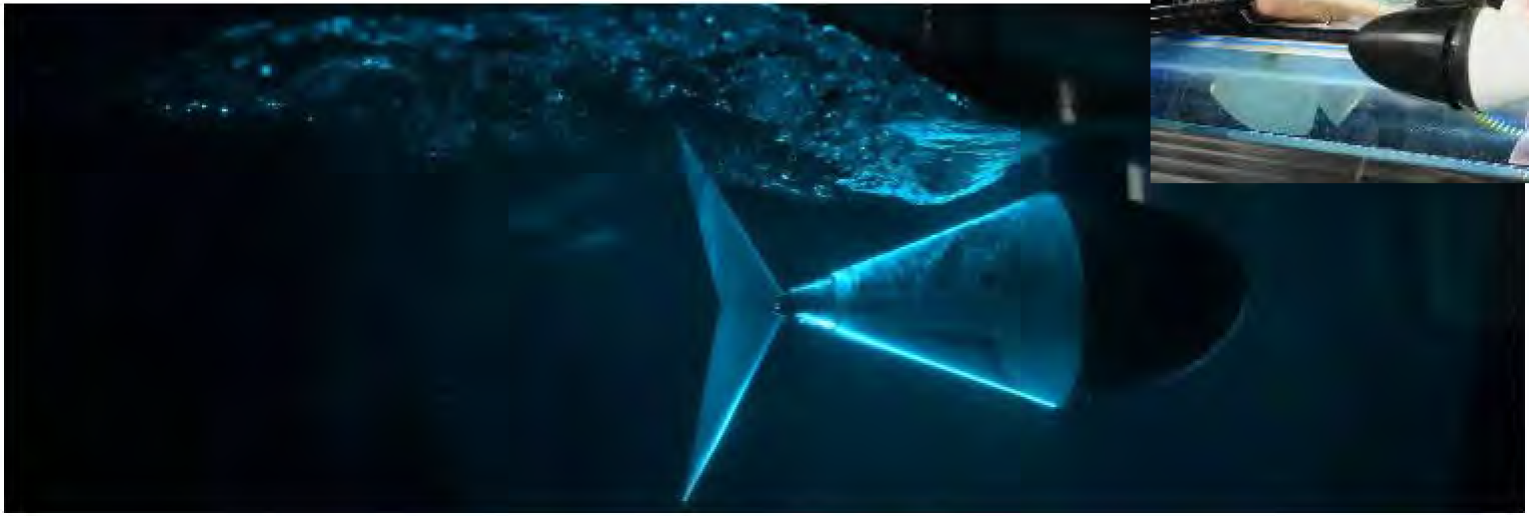
By Fariss Samarrai, farisss@virginia.edu • June 5, 2020

A mobile robot, designed to work in hazardous environments, has been modified to kill the virus that causes COVID-19. (Photos by Sanjay Suchak, University Communications)

A Robotic Fish Tail and an Elegant Math Ratio Could Inform the Design of Next-Generation Underwater Drones

August 11, 2021





Wearable Electronics: Do You Have Exoskeletons in Your Closet?

November 17, 2022

By Wende Whitman | wende@virginia.edu

Associate professor Sarah Sun. Photo by Tom Cogill for UVA Engineering.

UVA Engineering Professor Secures Federal Small Business Grant to Improve Heat Management in Advanced Microelectronics

October 25, 2024

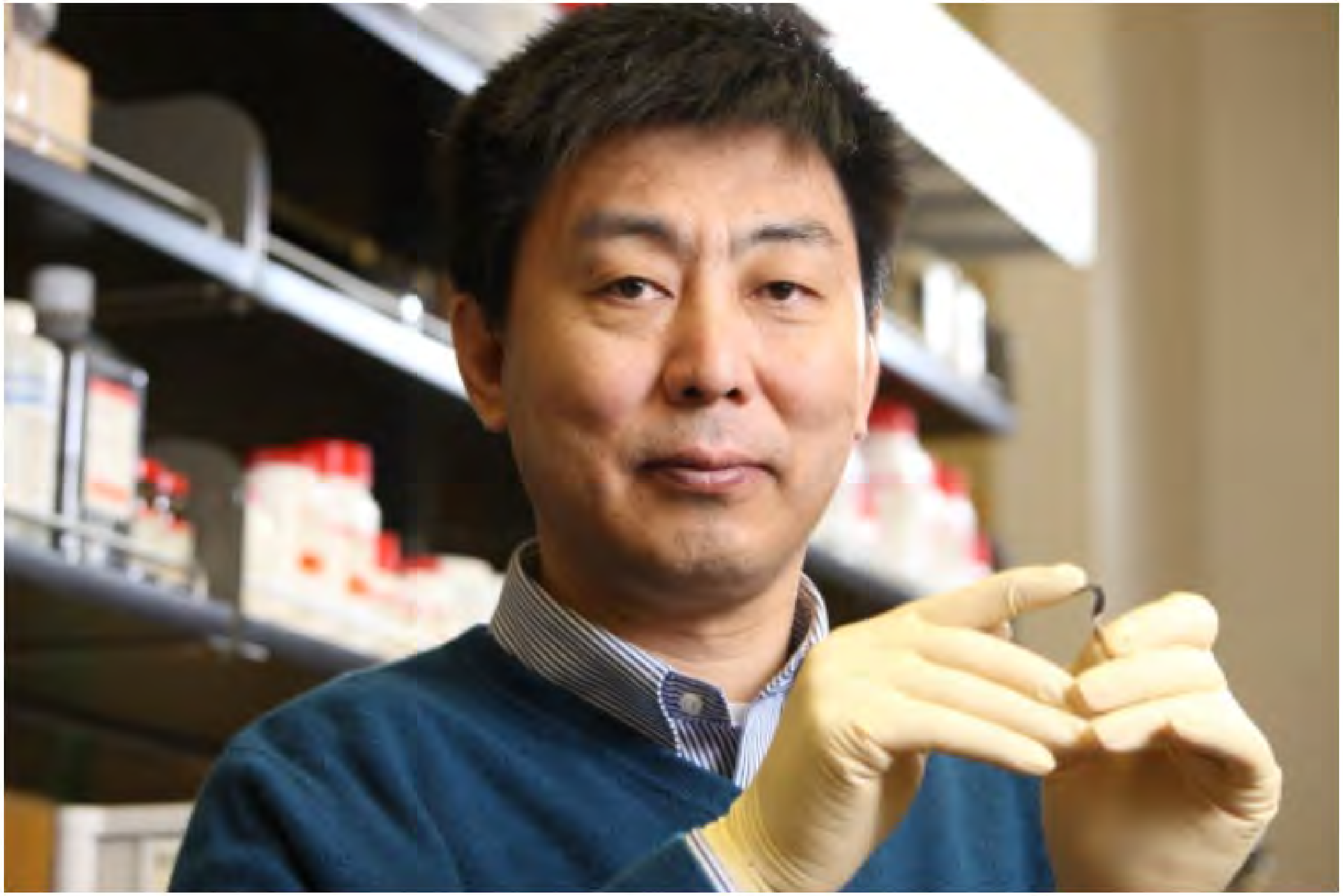
By The Office of Communications at the UVA School of Engineering and Applied Science | engr-comms@virginia.edu

Way Cool: UVA Professor Developing 'Freeze Ray' Technology for the Air Force

UNIVERSITY NEWS

Inspired by the World, Chris Li Turns Nature Into Nanotechnology

- January 17, 2014



Xiaodong (Chris) Li is one of 13 new engineering faculty hires for the current academic year and is the second of two faculty members hired as a Rolls-Royce Commonwealth Professor.

UVA Researchers Pioneer AI-Driven Manufacturing Efficiency

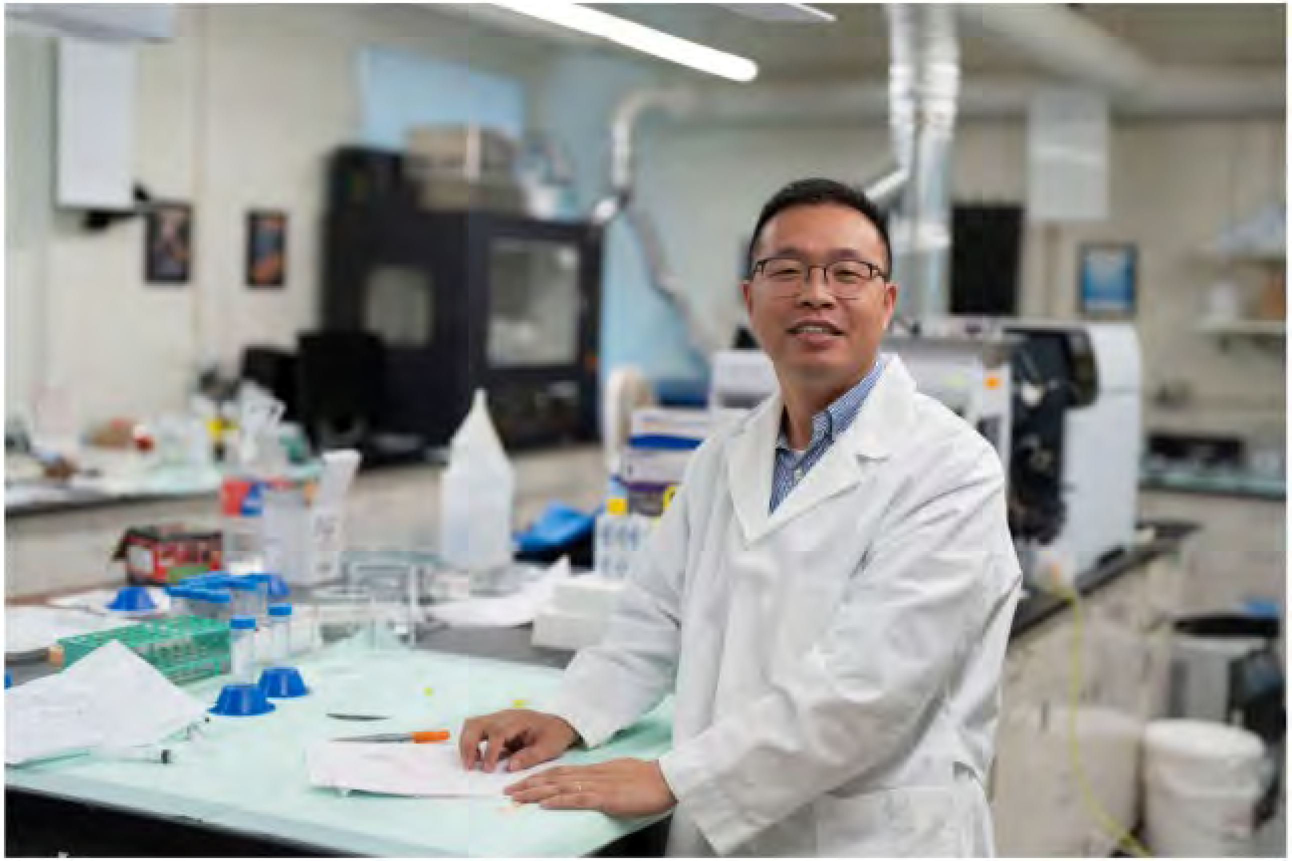
October 14, 2024

By The Office of Communications at the UVA School of Engineering and Applied Science | wende@virginia.edu

RESEARCH & DISCOVERY

News in Brief: Want To Buy a Humanlike 'Soft Robot'? UVA Shares Manufacturing Secret

By Eric Williamson, williamson@virginia.edu • August 23, 2023



ME & AE Curriculum Focus

- Fluids & Thermal Transport
- Structures & Materials
- Dynamics & Control

- Experimental & Computational Method
- Probability and Mathematical Analysis

- Systems Level Design
- Mechatronics (ME)
- Flight Vehicles (AE)
- Research & Development

Mechanical Engineering Curriculum

Spring 2025 Courses

1st Years May be Eligible

- MAE 2040 Computer Aided Design
- MAE 2300 Statics (Physics I Prereq)
- MAE 2100 Thermodynamics (Calc II Prereq)

2nd Year

✓ Offered in both Spring and Fall semesters

THIRD SEMESTER				FOURTH SEMESTER		
		credits				credits
APMA 2120	Multivariable Calculus III	(4)		APMA 2130	Ordinary Differential Eq.	(4)
MAE 2020	Intro to Mechanical Engr	(2)		MAE 2100	Thermodynamics	(3)
MAE 2040	Computer Aided Design	(1)		MAE 2310	Strengths of Materials	(3)
MAE 2300	Statics	(3)		MAE 2320	Dynamics	(3)
PHYS 2415	General Physics II	(3)		MAE 2330	Mechanics Laboratory	(2)
PHYS 2419	General Physics II Workshop	(1)		___________	Unrestricted Elective 1[4]	(3)
STS 2600	Engineering Ethics	(3)				
	Total	(17)				(18)

3rd Year

✓ Offered in both Spring and Fall semesters

FIFTH SEMESTER				SIXTH SEMESTER		
		credits				credits
APMA 3140	Applied Partial Diff. Eqns	(3)		MAE 3140	Elem Heat & Mass Transfer	(3)
MAE 3210	Fluid Mechanics (ME)	(3)		MAE 3420	Computational Methods	(3)
MAE 3230	Thermal Fluids Laboratory	(2)		MAE 3620	Machine Elem & Fatigue	(3)
MAE 3310	Aerospace Structures	(3)		MAE 3840	Mechanical Engineering Lab	(2)
MAE 3710	Mechanical Systems	(3)		MAE 4710	Mechatronics	(4)
____________	Unrestricted Elective 2[4]	(3)		APMA 3110	Applied Probability & Statistics	(3)
	Total	(17)				(18)

UNIVERSITY of VIRGINIA

The Mechatronics Lab

The MILL

(The Mechatronics Innovation and Learning Lab)

4th Year

SEVENTH SEMESTER				EIGHTH SEMESTER		
		credits				credits
MAE 4610	Mechanical Engineering Design I[6]	(3)		MAE 4620	Mechanical Engineering Design II[6]	(3)
STS 4500	STS and Engineering Practice	(3)		STS 4600	Engineer, Ethics, Prof. Resp.	(3)
_________	Math-Science/Tech Elective 1[7]	(3)		_________	Math-Science/Tech Elective 3[6]	(3)
_________	Math-Science/Tech Elective 2[7]	(3)		_________	HSS Elective 3	(3)
_________	HSS Elective 2	(3)		_________	Unrestricted Elective 3[4]	(3)
	Total	(15)				(15)

University of Virginia

4th Year Design Projects

- Learn to design, build, and test a component or system
- Topics of 2024-2025 projects:

Dr. Forman: Torque-based Bone Density Estimation
Dr. Forman: Wrist Fracture Simulator
Dr. Garner: Educational Engine
Dr. Kent: Head-to-Ground Helmet Test
Dr. Lagor: Energy Harvesting via Ballonet
Dr. Matharu: Hybrid Humanoid Robot
Dr. Scott: Kelvin Fridge
Dr. Smith: ASME Ball Bearing Sort & Transport
Dr. Smith: ASME Robot Mini Golf Competition
Dr. Sun: EEG Controlled Robot
Dr. Sun: Wearable Robot Assist
Dr. Tomonari: Solar Car Suspension
Dr. Ward & Dr. Sun: Triboelectric Energy Harvester
Dr. Xu: Flexible Temperature Sensor

Capstone Design Team | Mechanical Engineering | Spring 2023

University of Virginia School of Engineering

Dept. of Mechanical and Aerospace Engineering

Platooning Campus Vehicles

Cameron Chiaramonte, Patrick Dunnington, Gilchrist Johnson, Nicholas Sofinski, Alexander Wilson

Faculty Advisor: Professor Tomonari Furukawa

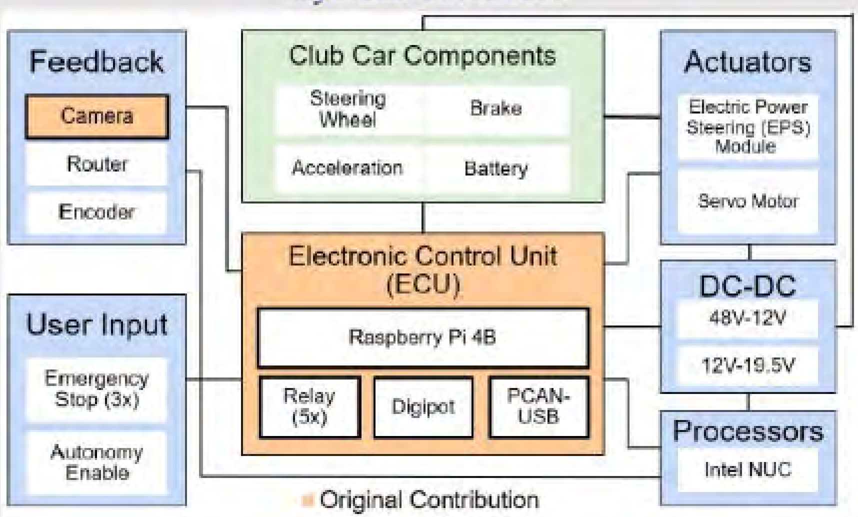
Objective

Our goal is to develop a semi-autonomous system of golf carts that have platooning capabilities, while retaining their normal functionality. Platooning: The first cart is manually driven and the follower carts autonomously follow.

Societal Needs

Increasing accessibility for disabled / injured persons in navigating the extensive and hilly terrain on college campuses; also adds to current autonomy research

System Overview



Project Design & Implementation

Steering

Nexteer Electric Power Steering (EPS) module with a custom mount allows for electronic control

Electronics

The electronics box contains the Raspberry Pi, NUC, and other hardware components

Braking

The brake pedal is controlled using a servo motor and pulley system

Software/Testing

Open-loop design based on encoders. Executed as a ROS package written in Python.

Successfully demonstrated a proof-of-concept for platooning with the systems we implemented

Significance & Conclusion

With a theoretical unlimited capacity, platooning allows for customization and on demand adaptability at the flip of a switch. Reproducibility due to the project design allows for the production of additional carts to increase platoon size.

Aquaculture-Focused Co-Robotic System Design

UNIVERSITY of VIRGINIA

Kristen Babel, Charles Tilney-Volk, Peter Stauffer, Brian Richard, Alvaro Crisanto
Advised by Prof. Tomonari Furukawa

Introduction

At the current rate of global population growth, food production must increase by 70%. A sustainable solution is aquaculture farming. While many nations have adopted this technique, the U.S. lags behind, generating a meager 7% of its food from aquaculture farming.

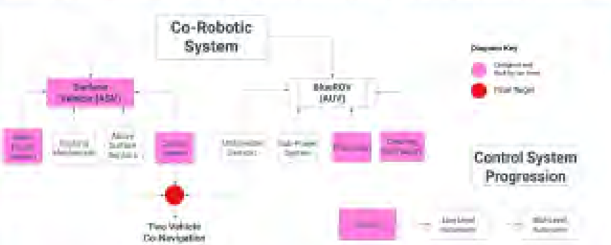
Problem Definition

The maintenance of these farms to prevent biofouling is difficult/dangerous to workers. This challenge offers an opportunity to introduce an autonomous system, capable of sustainably cleaning and maintaining these fish pens.

Objective & Design Goals

The design goals listed were extracted from customer feedback, and the diagram below breaks down our objective – a co-robotic system targeting the problems surrounding aquaculture pen maintenance.

- **Minimize** → SWaP (size, weight, and power requirement) / no. of moving parts and powered components / transportation costs (energy per dist.)
- **Maximize** → Operational range of ASV + AROV



Design

Surface Vehicle: a centralized system composed of cooling, electrical, and control mechanisms are housed in a weatherproof case which sits atop a catamaran-style hull. Key to this design is its compact size, which is easily portable and can be carried by a single person.

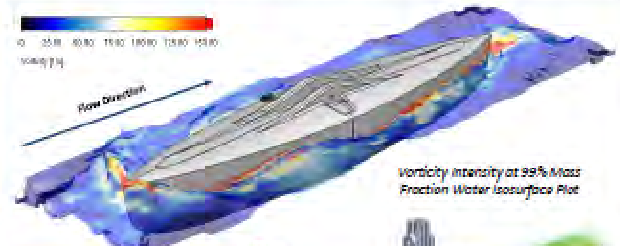
The cleaning mechanism is composed of a pump supplying ocean water to be ejected from four concentric nozzles with a rotating disk. This system cleans the pens using high-pressure jets without causing net damage.

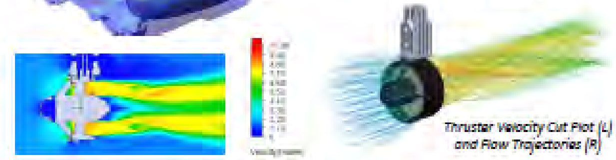
Methods for Analysis

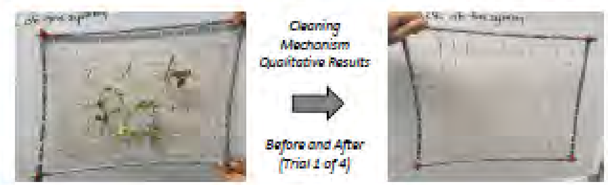
1. Thermal Testing for Cooling System Performance
2. Debris Removal Testing of Cleaning Mechanism
3. Operational/Controls Testing of Surface Vehicle
4. Simulation and Numerical Analysis
   a. CFD (external flows) – vehicle efficiency, drag, etc.
   b. FEA (abuse loads) – durability and user mishandling

Findings & Properties

Results from extensive fluid and structural simulation, analysis, and testing are as follows. The cleaning mechanism successfully removed debris from the faux net, as shown in the before and after images below.







Conclusions & Future Work

The systems developed this year show significant progress towards the goals outlined in the initial design. Future work could include cleaning mechanism improvements. Additionally, the system can be brought to higher level autonomy, and gain capability of co-navigation.

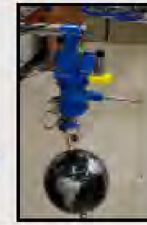
Dept. of Mechanical & Aerospace Engineering

Capstone Design Team | Mechanical Engineering | Dec 2022

The Mechatronic Orrery: A Time Machine

George Ardura, Bjorn Bergloff, Sarah Hemler, Samuel Montante, James Brad Pace, and Samuel Sheppard

advised by
Prof. Gavin Garner



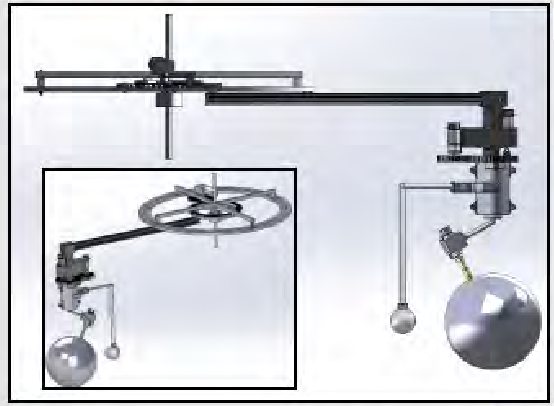
Objectives and Overview

This project endeavored to design and construct the world's first mechatronic orrery capable of quickly and automatically showing the alignment of the Sun and the Earth and the Moon at any specified date and time over a thousand years. Mounted in the Mechanical Engineering Building as a testament to UVA's Mechanical Engineering prowess, this unique display will help to foster curiosity in both mechanical and aerospace engineering students as well as prospective students and help to inspire the next generation of engineers and space explorers. Being able to instantly visualize our Earth's current position around the Sun or to immediately look up the alignment at an important date in the past or future (e.g., the date of your birth or the date of the next solar eclipse) can often lead people to profound realizations about their place our larger universe.

A Traditional Antique Mechanical Orrery

Background and History

For centuries, humans have designed and constructed orreries as a means of displaying and predicting the clockwork motions of our solar system's heavenly bodies. These have always been constructed as traditional, purely-mechanical devices in which some sort of simple motion (the user turning a crank by hand) would be transmitted through elaborate combinations of gears and concentric shafts to spin each of the celestial bodies around at different rates.



Mechanical Design

The design and assembly of this mechatronic orrery proved to be every bit as challenging a puzzle as those presented by traditional orreries. Our mechatronic solution incorporated four DC brush motors, each equipped with a quadrature encoder. These four motors were carefully homed relative to inductive proximity sensors. They could then be moved to any specified target position in order to match positions stored within the celestial alignment database. Two multiconnection sliprings were also incorporated into the design in order to allow the transfer of power and data through infinitely-rotatable revolute joints.

Software

Celestial position data for the location of the Earth and its moon relative to the Sun was retrieved from the NASA Goddard Space Flight Center's eclipse website and transformed and linearly interpolated into precise quadrature encoder target positions for each of the four motors. Two Parallax Propeller 2 microcontroller chips were then programmed to handle the time and date input from the user interface and to control all of the orrery's complex motions in order to realize the user's desired position as it whirs around, traveling through both time and space.

Working Prototype of the World's First Mechatronic Orrery

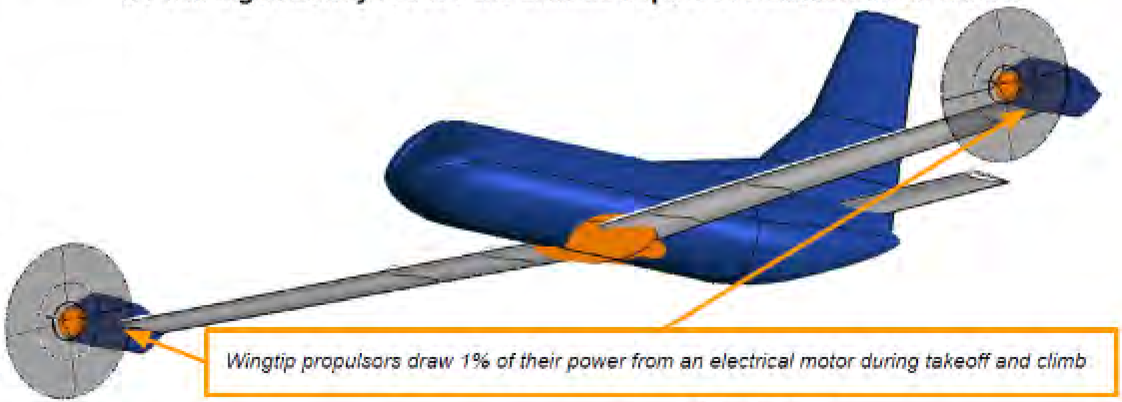
Conceptual Design of a Hybrid-Electric Regional Turboprop

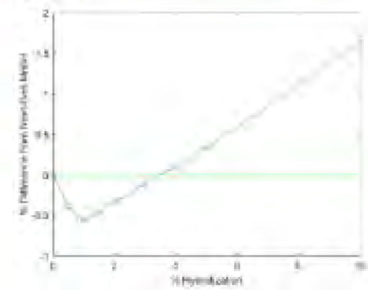
Robert Taylor, Christian Prestegard, Catherine DeScisciolo, Vincent Fimian, Kyle Hunter, Daniel Lattari, Kazi Nafis, Michael Richwine, Nathan Vu

Aviation accounts for 2.5% of global CO_2 emissions. By using new engine and structural technologies, we can significantly reduce the climate impact of commercial air travel.

Design Goals:

- Significantly reduce fuel burn on 500 nmi mission
- Improve takeoff and landing performance
- More comfortable and more appealing than current turboprops
- Design range of 1000 nmi
- 2035 entry-into-service

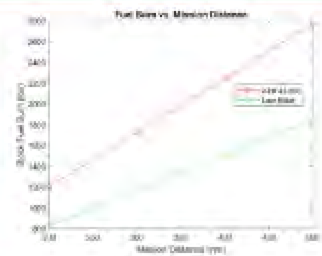


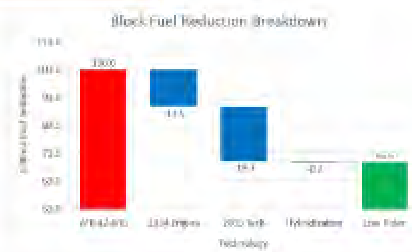


Li-ion batteries were the only viable energy storage option on this timescale. Low energy densities mean that benefits are only realized at low levels of hybridization

As the latest and most common aircraft in the regional turboprop market, the ATR 42-600 was used as the performance benchmark

Performance Metric	ATR 42-600	Low Rider
Block Fuel Burn on 500 nm Mission	2776	1850
Takeoff Field Length (ft) MSL / 5,000 ft MSL	3,632 / 4,112	1,870 / 3,249
Landing Field Length (ft) MSL / 5,000 ft MSL	3,196 / 3,477	2,608 / 2,834
OEW (lbs)	25,904	20,961
MTOW (lbs)	41,005	37,255
500 nmi Mission Time (min)	135	142
Maximum Range (nm)	726	1000





Reduced drag from wingtip propulsors, advanced engine technologies, weight savings from new structural materials, and hybridization lead to a **33.4% reduction in block fuel burn** and significantly improved performance

Department of Mechanical and Aerospace Engineering

University of Virginia Engineering
Dept. of Mechanical & Aerospace Engineering

SkyKings Aircraft Design Team | Aerospace Engineering | May 2023

Songbird-E

James Caputo, Darius Espinoza, Jannik Gräbner, Ryan Grant, Ryan Keller, Eun Park, Kangyi Peng, Alexander Poley, Alex Wang, advised by Prof. Jesse Quinlan

SkyKings

2023 AIAA Aircraft Design Competition

The objective of this project is to design and evaluate a hybrid-electric, regional, turboprop passenger transport, supporting aviation's push toward sustainable operation by mid-century. The aircraft must provide a 20% reduction in block fuel burn over current state-of-the-art turboprops on a 500 nmi mission and reduce harmful emissions. The intended entry-into-service year is 2035.

Design Requirements

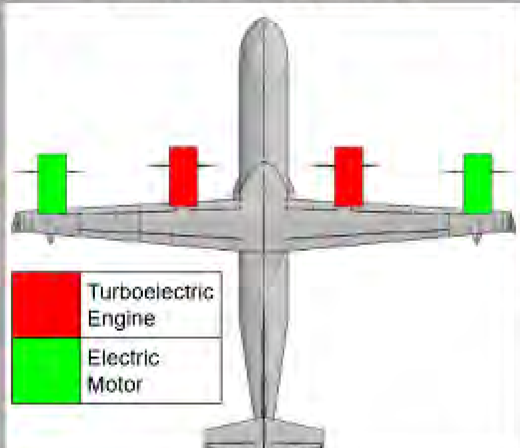
Criteria	Songbird-E
Entry-into-Service Year	2035
Passenger Capacity	46-50
Efficiency	20% reduction in block fuel while also reducing emissions
Cruise Speed/Altitude	275 kts
Design Range	1,000 nmi
Economic Range	500 nmi
Certifications	VFR & IFR, Icing, CFR Part 25

Design Approach

- Requirements analysis
- Initial concept ideation
  - 9 concepts created, 3 down-selected
- Weight estimation and constraint analysis
- Analysis and down-select to preferred concept
  - Propulsion (GasTurb, XROTOR, MATLAB)
  - Aerodynamics (VSPAero, FlightStream)
  - Structures (OpenVSP, Inventor)
  - Performance (FLOPS, AAA)
- Conceptual design, vehicle sizing, and mission analysis for preferred concept
- Design and mission trade studies

Final Design

Turboelectric Architecture



Key Upgrades

- Improved aerodynamics
- Full use of advanced composites
- Futuristic Subsystems
- Lightweight cabin upgrades

Key Performance Parameters

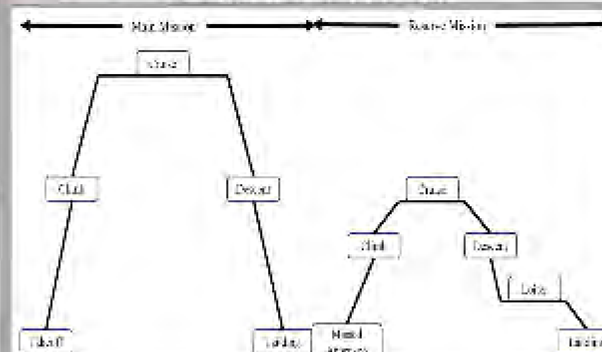
Takeoff Gross Weight	39,840 lb
Empty Weight	23,305 lb
Wing Area	629.8 ft^2
Passenger Capacity	50
Econ. Block Fuel Burn	1,855 lb
Block Fuel Reduction	-33.6%
Thrust-Specific Fuel Consumption	0.391 lb/lb-hr
Sale Price	$28.4 Million
Operating Cost	$2,960/hr

Propulsion
- 2x 2034-Tech PW127XT
- 2x 2034-Tech Electric Motor
- Max Thrust: 9796 lbs

Subsystems
- Fly-by-Light
- Power-by-Wire
- FADEC

Landing Gear
- Tricycle Layout
- Single Nose Gear
- Two Main Gear

Design Mission Profile



MAE Faculty & Societies

ASME
SETTING THE STANDARD

Pi Tau Sigma
Honorary Mechanical Engineering Fraternity

AIAA

Sigma Gamma Tau
NATIONAL HONOR SOCIETY IN AEROSPACE ENGINEERING

Pi Tau Sigma

Virginia Delta Xi Chapter

What is Pi Tau Sigma?

- Pillars:
  - Integrity, Service, Leadership
- Academic Recognition
- Social
- Service
- Tradition

Academic Recognition

- ➢ Ranking (top 25%)
- ➢ Resumé and Employment
  - Career fairs
  - Alumni Network
  - TA, RA
- ➢ Graduation Stole

Service

- Giving back to Mech-E Department
  - Open houses
  - Majors fairs
  - MAE Picnic
- Mentoring
  - Office Hours
  - Career Fair Advice

Aero Design Team at UVA

Hoos Flying

UNIVERSITY of VIRGINIA | ENGINEERING

Why join a design team?

Academics

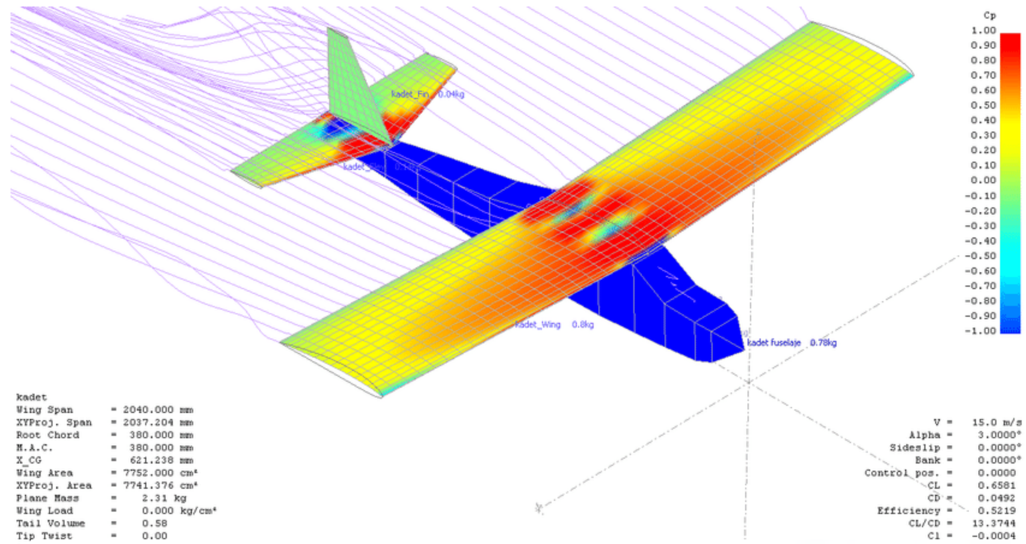
- Real world application of course curriculum
- Improved performance in 3rd year major classes
- Develop a strong community within the MAE department

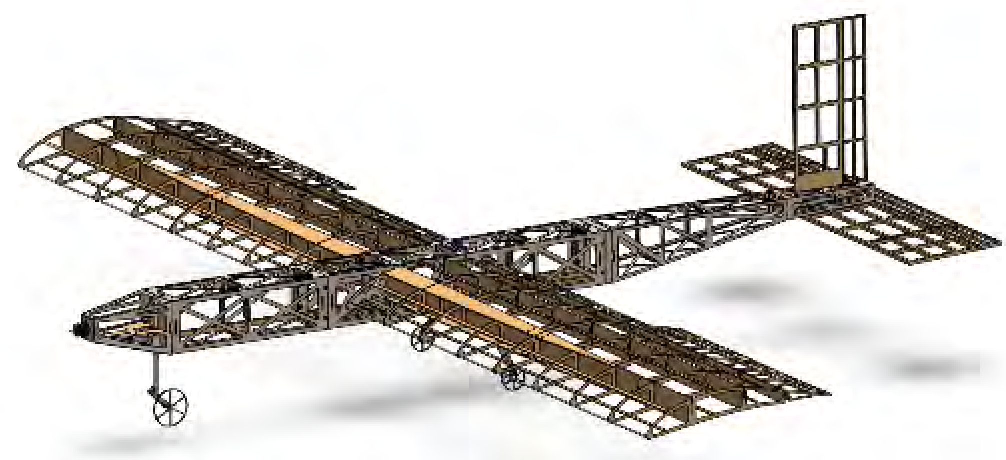
Career

- Increased access to internship opportunities
- Major green flag on resume

Design

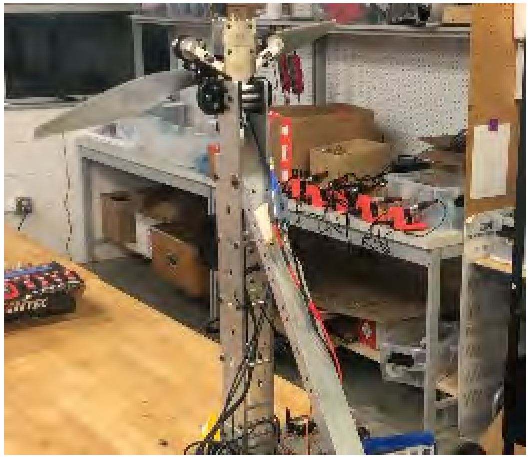
- Conceptual Design
- Analyze Ruleset
- Test and discuss aircraft configurations
- XFLR5 – stability, sizing, and weight
- Design Reviews: CoDR, PDR, CDR
- SolidWorks CAD of full aircraft





Build

- Waterjet, CNC, Laser Cutter
- Lacy Hall build sessions
- Wood construction techniques: superglue, epoxy, mechanical linkages
- Monokote wrapping
- Integration & Assembly



Fly

- Motor/propellor thrust testing
- RC servo flight integration
- Test flights at Milton Airfield
- Test crashes at Milton airfield

VIRGINIA
MOTORSPORTS

WHAT IS VIRGINIA MOTORSPORTS?

Our Mission:

- Experiential learning: learning by **doing**
- Develop communication and teamwork skills
- Learn effectively & independently

Our Members:

- Build a formula-style race car **from scratch**
- Learn all disciplines of engineering

WHAT IS FORMULA SAE?

- Formula SAE is a collegiate design competition sponsored by the Society of Automotive Engineers (SAE)
  - students design and manufacture a formula-style race car, either combustion or electric
  - 4000+ students from around the world

- We build a new car every year
  - This year will be our second electric car

FAQS

Can I drive it?

If you put in the work and effort to help build it, yeah.
We hold driving days to allow active members to drive.

How fast does the car go?

We estimate about 70-80 mph, but we've never tested that.

How did your team place?

We typically place around the top third of teams.

Requirements for joining?

(You probably meet both of these if you're here/reading this)

Be a UVA student.
Show up.

Ok…… but I don't think I know enough…

…. Neither did we, yet here we are.

That’s us!!!

Formula SAE Michigan

Michigan International Speedway

Red Bull Show Run

Washington, DC

Formula South

Kennesaw, GA

Pittsburgh Shootout

Big Beaver, PA

GET INVOLVED!

Why should you join?

- Experiential learning
  - Apply classroom knowledge & learn new skills
- Real-world engineering experience
  - Resume experience and networking
- Experience working with a team
- **Employers like seeing FSAE on your resume**

CONTACT US!

Website:
virginiamotorsportseducation.org/

Email:
virginiamotorsport@gmail.com

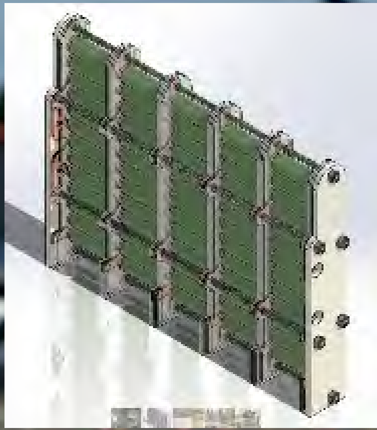
Instagram: @vamotorsports

Join Slack: Virginia Motorsports
Use your school email!
Join #formula25


SOLAR
Solar Car at UVA
UVA
UVA ENGINEERING
UVA Parents Fund
BRIDGESTONE
STUDENT COUNCIL
APEX CLEAN ENERGY
KEYSIGHT

Mission:

1. Build and race a solar-powered electric vehicle to compete and represent UVA
2. Provide an advanced hands-on learning experience on a real project



No prior experience needed!

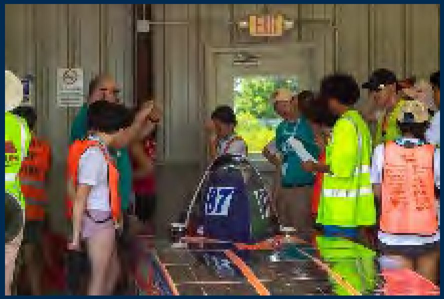
What to Expect:

- Work on one subteam
- Be given productive work immediately
- Learn while doing; come up with questions

<u>Typical commitment</u>: 4-10 hours per week

- One Sunday meeting (3 hrs)
- One to two midweek subteam meetings

The time you put in is what you get out!



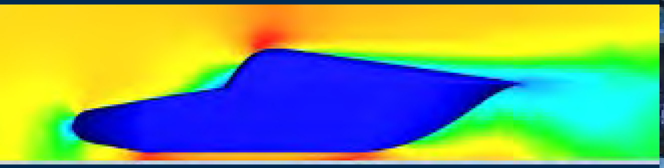
Aerobody & Composites

Aerobody:

- Design & manufacture composite exterior
- Advanced CAD modeling & Computational Fluid Dynamics
- Integration with mechanical & electrical components
- Functional feature design

Composites:

- Composite lamination techniques (i.e. Resin Infusion)
- Sandwich structures, fiber orientation, leveraging material properties
- Composite mold design and manufacturing



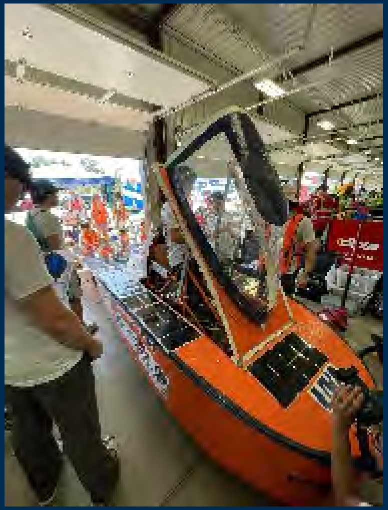
Brakes & Steering

What we do:

- Designing braking components in Solidworks
- Prototyping designs on advanced equipment
- Acquiring sponsorships to fund parts
- Ensuring car safety

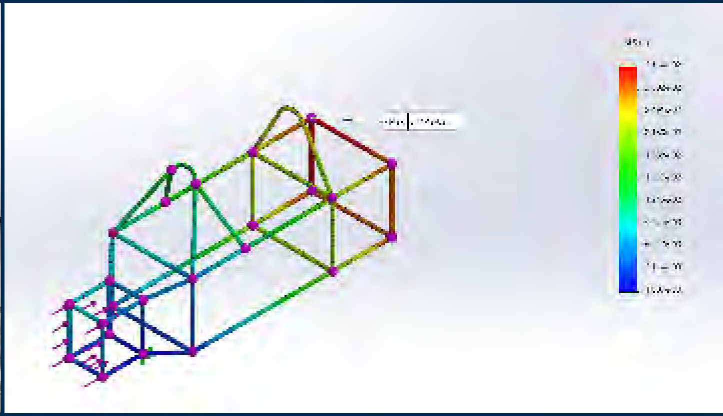
Skills:

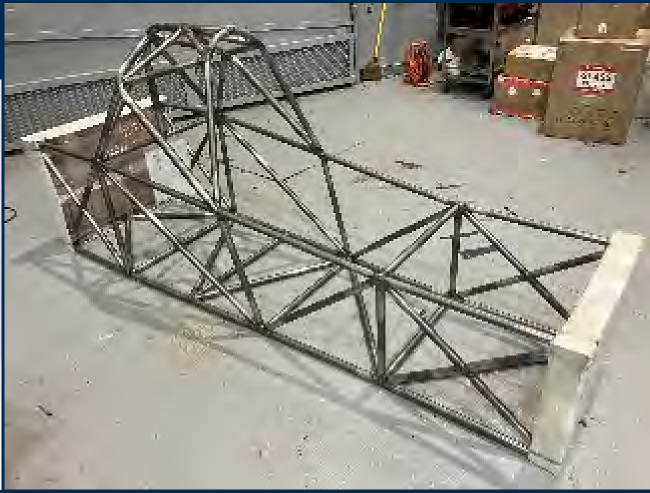
- CAD skills in Solidworks
- Advanced machining skills (waterjet, mill, etc.)
- Full beginning-to-end design cycle experience
- Experience working with an **electric, solar-powered car**



Chassis

- **Design** + **Manufacture** the chassis which is the primary structural portion of the car
- **Integrate** all other subteam components into the chassis design
- **Learn + Use** skills like Computer-Aided Design (CAD), Finite Element Analysis (FEA), and welding

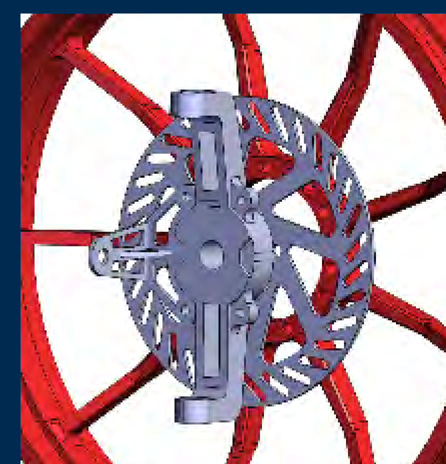


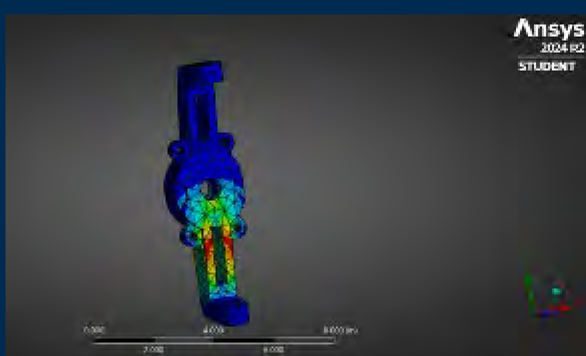


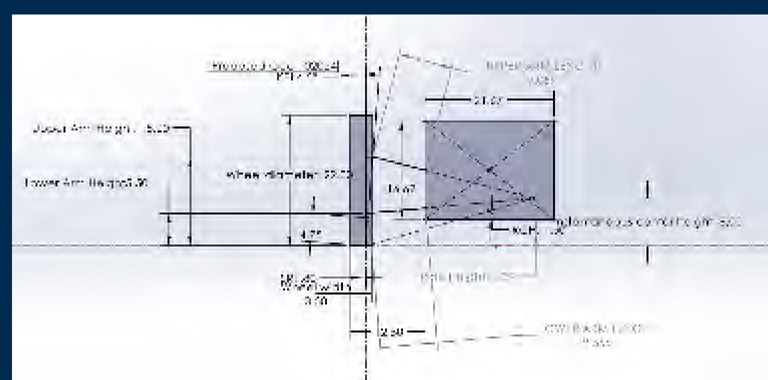
Suspension

Working with the moving parts of the solar car

- CAD Model Suspension Geometry
- Suspension analysis, includes Finite Element Analysis for various loads and fatigue over time
- Manufacturing and construction of suspension (CNC, water jetting, welding, girlbossing)







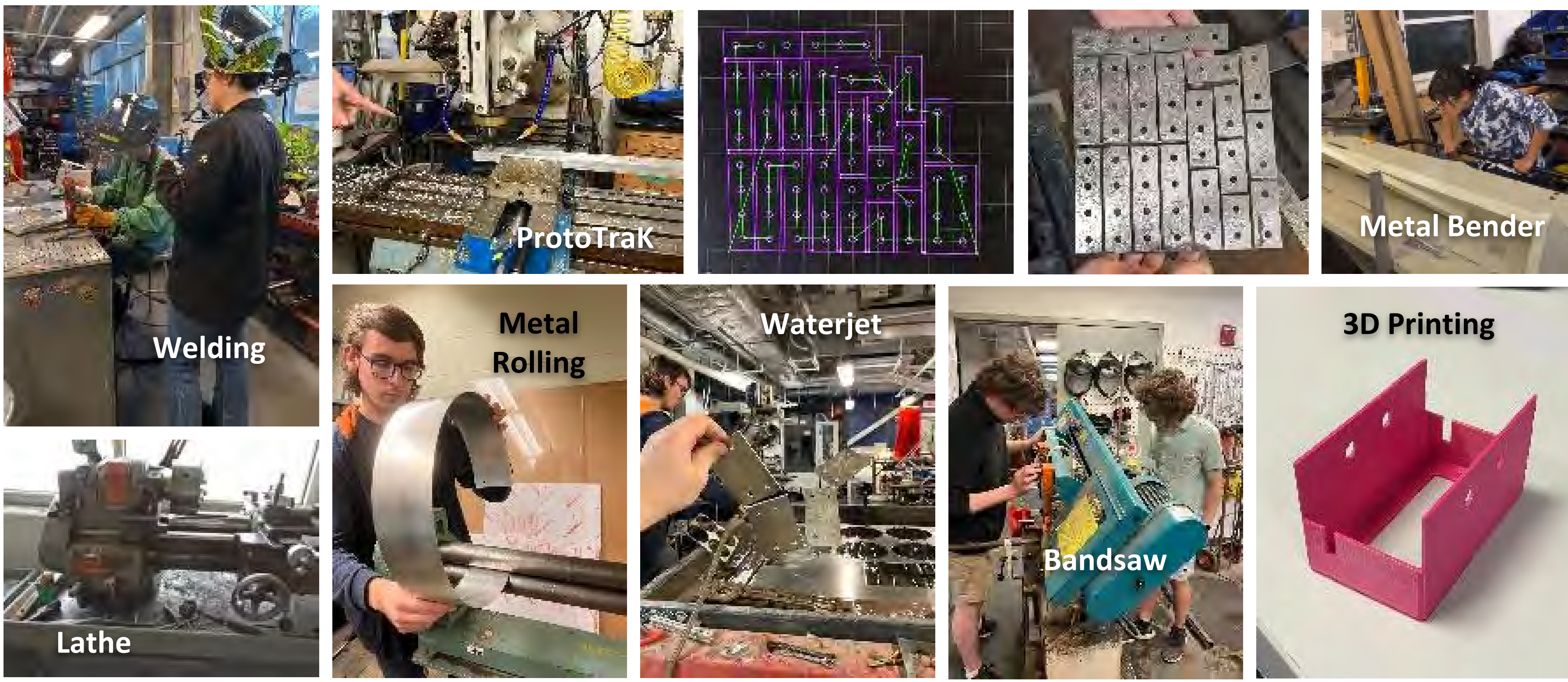
Our Alumni:

MARS

Mechatronics and Robotics Society

- Compete in NASA Lunabotics Competition
- Build a lunar mining and construction robot
- Used to support Artemis missions
  (going back to the moon)

Manufacturing



MAE Undergraduate Research

Professor Haibo Dong, Program Director

MAE Summer UG Research Program

- ✓ The MAE department offers 8-10 weeks Summer Undergraduate Research Program (SURP) experience for undergraduates wanting to build their skills as young researchers.

- ✓ As a summer research assistant, you will be immersed in research opportunities. You'll gain valuable experience in the lab and work closely with your mentor on a research project designed specifically for summer students.

MAE Summer UG Research Program

Examples of research topics from Summer 24

- ✓ Multi-Camera Imaging of Biomechanical Analysis
- ✓ Composites for Electric Vehicles (EVs)
- ✓ Bio-inspired underwater robotic systems with flexibility and schooling interaction
- ✓ Computational Propulsion
- ✓ Bio-inspired system design and experiment
- ✓ Scramjet Propulsion Research
- ✓ Floating Wind Energy and Energy Storage
- ✓ Optical Diagnostics for Reacting Flow Systems
- ✓ Aerodynamic Laboratory Design and Testing
- ✓ Biomechanical evaluation and measurement of microstructural bone characteristics
- ✓ Tibia Injury Criteria Development
- ✓ Kinematic and Injury Response of Reclined Small Females and Crash Test Dummies
- ✓ Flow Measurement via Particle Tracking Velocimetry in the Towing Tank Facility

Center for Engineering Career Development

Heather Palmer, Assistant Director

Find us in Thornton Hall, A-Wing

engineering.virginia.edu/careers

How our team supports undergraduate students:

- Exploring careers
- Gaining experience
- Crafting job and internship search strategies
- Creating strong resumes and cover letters
- Applying to graduate school
- Learning how to navigate employer and alumni events
- Networking and interviewing
- Evaluating options and making decisions

“First Destinations” of ME graduates

Here is a sample of the companies Mechanical Engineering students choose to work for immediately after graduation:

- Consulting firms like Accenture
- AeroJet RocketDyne
- Aurora Flight Services
- Blue Origin
- BMW Manufacturing
- Boeing
- Clark Construction
- General Motors
- Lockheed Martin
- Merck
- Norfolk Naval Shipyard
- Northrop Grumman
- Rolls-Royce
- Schneider Electric
- SpaceX

MAE UG Research and Internships

A living document maintained by the MAE department for students to look for internship opportunities

UVAccelerated Program

-Accelerate your time to completion of a non-thesis Master's degree-

Professor Peter Griffiths, Program Director

UVAccelerate

Non-thesis Master's of Engineering degree:

- More interesting and challenging job opportunities, accelerated career advancement, and higher earning potential throughout your career.
- UVA Engineering graduate students report an average starting salary $30,000 higher than bachelor's graduates.
- https://engineering.virginia.edu/undergraduate-study/current-undergrads/uvaccelerate

APPLICATION & DEADLINES

- Online application: https://applycentral.virginia.edu/apply/
- Apply during 3rd year.
- Opens December 1st , closes March 1st, and decision within 30 days.
- No application fee, optional GRE, & one letter of recommendation for UVA Engineering students

COURSE REQUIREMENTS

30 credit hours of 5000 or 6000 level classes

- Minimum of 18 credit hours of MAE classes
- Up to 12 hours outside the department for engineering, math, or science related courses
- No more than 9 credit hours from 5000 level classes
- No more than 6 credit hours from 5000 level MAE classes
- MAE 7510 – Research Seminar only required class
- Part of Cardinal Education program

TRANSFER CREDITS

Up to 15 credit hours can be transferred towards degree

- Cannot have been counted towards undergraduate degree
- Charged at undergraduate rate before graduation