

2021 CSRSEF Awards

Best of Fair

Grand Champion With Distinction, ISEF finalist	Christine Ye	Data-Driven Approaches to Pulsar Glitch Triggers, Evolution, and Universality
Grand Champion, ISEF finalist	Yuchen Li	Scenario Dependence of Atlantic Meridional Overturning Circulation Weakening: A Geostrophic Shear Approach
Grand Champion, ISEF finalist	Gabriella Lui	Apply Machine Learning to Identify a Novel Biomarker Panel to Predict Rheumatoid Arthritis
Grand Champion, ISEF finalist	Julia Liu	Predicting Cancer Stem Cell Markers With Machine Learning
Grand Champion, ISEF finalist	Kosha Upadhyay	High Accuracy Neural Network Based Deep Learning Solution For Non-Intrusive Early Diagnosis of Dementia.

Category Awards

Behavioral Sciences

First Place	Kosha Upadhyay	High Accuracy Neural Network Based Deep Learning Solution For Non-Intrusive Early Diagnosis of Dementia.
Second Place	Maile Hori	Effects of Music Lyrics on Heart Rate and Exercise Performance
Third Place	Harshini Iyer	Determining Effective Reading Mediums for Reading Comprehension for Students with Learning Disabilities
Fourth Place	Navya Kakkar	Eliminating Screens Before Bed: Effect on Sleep Duration and Quality

Biomedical Engineering

First Place	Gabriella Lui	Apply Machine Learning to Identify a Novel Biomarker Panel to Predict Rheumatoid Arthritis
Second Place	Jessica Wang	Creating an Informative SARS-CoV-2 Mobile Health Application
Third Place	Tayla Belikoff	Instrument Addition to Robotic Arm to Allow Use of Digital Stethoscope for Safe Examination of Infectious Patients
Fourth Place	Pranavi Rohit	A Painless, Multi-Use, and Mosquito-Inspired Hypodermic Needle

Cellular/Microbiology/Translational/Biomedical

First Place	Aayush Sheth	Using A Multiple Timepoint Siamese Net With Grey Matter and White Matter Hypersensitivity Volumes as Differentiating Metrics to Predict Onset of Alzheimer's Disease
Second Place	Eric Li	Computational Identification of Sex-biased Biomarker MicroRNAs & Genes Associated with Immune Infiltration in Breast Cancer
Third Place	Pinyu Liao	In-Silico Discovery and Design of Antisense PNAs for the Artificial Activation of the ccdAB Toxin-Antitoxin System to Combat Antibiotic Resistance
Fourth Place	Ishan Bansal	Understanding the effect of the microbiome upon infectious disease severity: A novel framework for developing COVID-19 therapeutics

Computational Biology and Bioinformatics

First Place	Julia Liu	Predicting Cancer Stem Cell Markers With Machine Learning Classification of Multiple COVID-19-like Diseases Using a Deep Learning Model Framework on Chest Radiographs and Principal Component Analysis of Extracted Image Features
Second Place	Ishan Panpaliya	Determining the prognostic value of the DNA methylation of the GYPC, NME1, and SLIT2 genes in human lung adenocarcinoma
Third Place	Uma Paul	Extreme Gradient Boosted Classification and Regression Trees to Predict Outcomes in Patients With Monoclonal Gammopathies of Undetermined Significance
Fourth Place	Aheli Dutta	

Earth and Environmental Sciences/Animal Science

First Place	Yuchen Li Navaneet Girikumar	Scenario Dependence of Atlantic Meridional Overturning Circulation Weakening: A Geostrophic Shear Approach
Second Place	Vanshika Singh	Auditory Classical Conditioning of the Cockroach <i>Periplaneta americana</i> Correlating the Standardized Precipitation Index with Wildfire Burned Area Data
Third Place	Saketh Dhulipalla	Using a Pearson Correlation Test and a Multiple Regression Model
Fourth Place	Mahathi Mangipudi	The Effects of Human Visitation and Temporal Patterns on Carbon Dioxide Levels in Carlsbad Cavern

Engineering Mechanical

First Place	Rishabh Venkatesan	Roof Moss removal with Drone
Second Place	Jake Chung	Study and Application of a Biomimetic Caudal Fin for Energy-Efficient Propulsion
Third Place	Meredith Hillier	Reinventing the Iron Lung: Improving Efficiency and Cost for Wider Accessibility
Third Place	Dan & Tiana Dumitrescu	Accident Replication Machine for Wearable Devices
Fourth Place	Louis Rickels	Harley Davidson Motorcycle Adjustable Luggage Rack
Fourth Place	Ander Streuli, Logan Middleton, Tommy Tran	Portable Modular Non-Cyclic Dry Ice Cooler

Engineering Environmental

First Place	Vedant Srinivas	Audiovisual Animal Warning System to Mitigate Roadkill
Second Place	Audrey Gruian	Investigating the Efficiency of Acoustic Cavitation on Water Purification
Third Place	Taj Khandekar	Predicting Nitrogen Contamination in the Gulf of Mexico
Third Place	Neha Krishnakumar	Reducing CO2 Emissions by Recycling Organic Plant Material into Biochar Separating Microplastics from Sand using Terminal Velocity and Density Differences
Fourth Place	Hannah Chen	

Energy, Sustainable Materials/Materials Science

First Place	Ethan Liao	Comparing How Various Organic Coatings Retain Water Resistance on Mycelial Materials
Second Place	Triana Fernando	Reverse Engineering the Amazon Padded Plastic Mailer Pouch Green Energy from Heat – Phase II : Exploring the Use of Thermoelectric Devices to Convert Solar Energy into a Renewable and Sustainable Power Source
Third Place	John Baker	
Fourth Place	McCall Barber, Julia O'Gorman	Competition Between Algae Species and the Resulting Impact on Glucose and Starch Production

Math/Physics/Chemistry

First Place	Christine Ye	Data-Driven Approaches to Pulsar Glitch Triggers, Evolution, and Universality
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Second Place	Siqi Zhao	Mean Variance Portfolio Optimization
Third Place	Gavin Pai	A Protocol to Play Battleship Without a Trusted Party
Fourth Place	Alyta Faugno	Utilizing a Biosurfactant in Creating an Acidic Soap to Reduce Soap Scum Formation

Robotics and Intelligent Machines

First Place	Nikhil Mehta & Aadiya Prasad	A Novel Implementation of Adversarial Networks Alongside Custom Identifiers Using Weighted Boxes Fusion for Diseased Crop Detection by UAVs
Second Place	Laura Mangov & Leonardo Robeiro de Brito	Training and Applying a Convolutional Neural Network to Identify COVID-19 in Chest CT Scans
Third Place	Zihan Sun	Machine Learning Image Recognition Table Tennis Trainer
Fourth Place	Karthik Shaji	Using Ant Colony Optimization to route UAVs to Active Fire Spots

Software/Embedded Systems

First Place	Aadi Dalia	Utilizing Convolutional Neural Networks and Generative Adversarial Networks to Predict Immunotherapy Response
Second Place	Cleah Winston	Modeling the Human Haptic Code: A Deep Learning Approach to Neuroprosthetic Development
Third Place	Pauline Saveliev	Predicting Human Survivability by Modeling Combinations of Extraterrestrial Environmental Factors
Fourth Place	Samuel Rodriguez	A Novel Software-Based Solution to Aid in the Detection and Prevention of Voice Phishing

Special Awards

American Institute of Aeronautics & Astronautics, \$50

Pauline Saveliev	Predicting Human Survivability by Modeling Combinations of Extraterrestrial Environmental Factors
Jake Chung	Study and Application of a Biomimetic Caudal Fin for Energy-Efficient Propulsion
Arun Khou	Aerodynamic Drone Cargo Container

American Chemical Society

First Place, \$100	Alyda Faugno	Utilizing a Biosurfactant in Creating an Acidic Soap to Reduce Soap Scum Formation
Second Place	Neha Krishnakumar	Reducing CO2 Emissions by Recycling Organic Plant Material Into Biochar
Third Place	Ethan Liao	Comparing How Various Organic Coatings Retain Water Resistance on Mycelial Materials
Honorable Mention	Natalie Spohn	Plant Inspired Carbon Filter
Honorable Mention	McCall Barber, Julia O'Gorman	Competition Between Algae Species and the Resulting Impact on Glucose and Starch Production
	Maile Hori	Effects of Music Lyrics on Heart Rate and Exercise Performance

American Society for Materials (ASM)

	Ethan Liao	Comparing How Various Organic Coatings Retain Water Resistance on Mycelial Materials
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American Women Geoscientists

	Taj Khandekar	Predicting Nitrogen Contamination in the Gulf of Mexico
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Inspiring Excellence Awards, \$50

	Ian Sjöholm	Creating a Block Based version of the Python Programming Language
	Stephen Malysz	Data Representation for Visually Impaired
	Christen Spadavecchia	An Extensible File Feature Analysis and Storage Framework for Linux Systems
	Pranavi Rohit	A Painless, Multi-Use, and Mosquito-Inspired Hypodermic Needle
	Saloni Sanger, Grace Lane	Remote Controlled, Vertically Rotating Bookshelf
	Nina Otebele	ARTC: Autonomous Robot Trash Collector

Mu Alpha Theta

	Siqi Zhao	Mean Variance Portfolio Optimization
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NASA Earth System Award

	Taj Khandekar	Predicting Nitrogen Contamination in the Gulf of Mexico
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NOAA "Taking the Pulse of the Planet Award"

Taj Khandekar	Predicting Nitrogen Contamination in the Gulf of Mexico
Yuchen Li	Scenario Dependence of Atlantic Meridional Overturning Circulation Weakening: A Geostrophic Shear Approach
Saketh Dhulipalla	Correlating the Standardized Precipitation Index with Wildfire Burned Area Data Using a Pearson Correlation Test and a Multiple Regression Model

Office of Naval Research

Jake Chung	Study and Application of a Biomimetic Caudal Fin for Energy-Efficient Propulsion
Julia Liu	Predicting Cancer Stem Cell Markers With Machine Learning
Benjamin Hawkins	Fixing Beach Erosion on Ocean Shores
Aayush Sheth	Using a Multiple Timepoint Siamese Net to Predict Onset of Alzheimer's Disease

Regeneron Biomedical Science Award, \$500

Aayush Sheth	Using a Multiple Timepoint Siamese Net to Predict Onset of Alzheimer's Disease
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RICOH Sustainable Development Award

Saketh Dhulipalla	Correlating the Standardized Precipitation Index with Wildfire Burned Area Data Using a Pearson Correlation Test and a Multiple Regression Model
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USAID Science Champion Award

Meredith Hillier	Reinventing the Iron Lung: Improving Efficiency and Cost for Wider Accessibility
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Stockholm Junior Water Prize

Hannah Chen	Separating Microplastics from Sand Using Terminal Velocity and Density Differences
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Taj Khandekar Predicting Nitrogen Contamination in the Gulf of Mexico

US Air Force Award

Arun Khou Aerodynamic Drone Cargo Container
Comparing How Various Organic Coatings Retain Water Resistance on Mycelial
Ethan Liao Materials
Modeling the Human Haptic Code: A Deep Learning Approach to
Cleah Winston Neuroprosthetic development
In-Silico Discovery and Design of Antisense PNAs for the Artificial Activation of
Pinyu Liao the ccdAB Toxin-Antitoxin System to Combat Antibiotic Resistance

**Yale Science & Engineering, Best 11th
Grade Award**

Christine Ye Data-Driven Approaches to Pulsar Glitch Triggers, Evolution, and Universality