

## MAE Senior Design Projects – Spring 2016

Project ID#: MAE0029

### AUTOMATED PIPETTING ROBOT

The project goal is to build an automated pipetting robot that can address 24 pipettes at a single time to transfer liquid in a precise and rapid manner to assist the research efforts of UCI Biology Professor Long.

**Students:** Anjan Chidambaram, Javier Davila Jr, Derek Gladstone, Eric Hernandez, Eric Huang, Pei Chi Wu, Vanessa Zin

**Advisor:** Vincent McDonell

**Advisor:** Farzad Ahmadkhanlou

Project ID#: MAE0032

### WHEELCHAIR POWERING AND TESTING

**Students:**

**Advisor:** Vincent McDonell

**Advisor:** Farzad Ahmadkhanlou

Project ID#: MAE0030

### WATER FIXTURE AUTOMATION

The aim of this project is to design, build, and automate water fixtures that will control bathtub and shower handles.

**Students:** Abdullah Abdal, David Garcia, Erin Ho, Kristen Huey, Alex Law, Tristan Macaraeg, Sohee Oh

**Advisor:** Vincent McDonell

**Advisor:** Farzad Ahmadkhanlou

Project ID#: MAE0028

### AERIAL WIND TURBINE

Aerial Wind Turbine project is to use an existing wind turbine design and suspend it inside a Helium balloon allowing for more steady and uniform air flow to pass through to generate power.

**Students:** Janelle Harkous, Leslie Hsiao, Jundong Hu, Daniel Klebe, Anchit Roy

**Advisor:** Dimitri Papamoschou

Project ID#: MAE0002

### AIAA DESIGN BUILD FLY

The UC Irvine Design/Build/Fly team is a senior design project which designs, manufactures, and competes electric remote-control airplanes in the annual international Design/Build/Fly competition, allowing students to validate analytic studies through practical application and gain real-world aircraft design experience.

**Students:** Caroline Alvarado, Raphael Antwi, Jordan Birnbaum, Wayne Chan, Richard Cheng, William Farrell, Enrique Gurrola, Allen He, Yun Peng Hsiao, Nick Huang, Justin Kerr, Daniel King, Saho King, Timothy Kinsey, Laliphat (Mai) Kositchaimongkol, Alex Kwok, Amoya Lewis, Sonny Li, Karla Marron, Nima Mohseni, Hiroki Nakajima, Anuj Patel, Ryan Razo, Raveen Solanga, Kristian Tana, Neptali Toribio, Daniel Tran, Johnny Wong, Shilong Xu, Willis Zhang

**Advisor:** Robert Liebeck

Project ID#: MAE0001

#### ADVANCED COMBUSTION TECHNOLOGY

Advanced Combustion Technology focuses on the design of plasma generation for applications to internal combustion exhaust gases to decrease pollutant emissions.

**Students:** Filippo Colagrande, Quan Diem Le, Adam Ullah

**Advisor:** Derek Dunn-Rankin

Project ID#: MAE0018

#### AFRL-HEAT PIPE

The UC Irvine AFRL Heat Pipe team is a senior design project which students design, develop, fabricate, and test a test frame that must be capable of precise orientation adjustments and to simulate outer space environments.

**Students:** Maral Abbasinik, Kamelia Asgari, Eric Huang, Daniel King, Sonny Li, Antonio Magana, Michael Rodriguez, Peichi Wu, Eric Yee, Willis Zhang

**Advisor:** John Larue

**Advisor:** Khalid Rafique

Project ID#: MAE0019

#### AFRL-HIGH HEAT FLUX

The objective of this project is to design, develop, and fabricate a testbed capable of producing and dissipating high heat fluxes/loads.

**Students:** Conor Ball, Said Bujdud-Gonzalez, Wesley Dodge, Alan Meza, Jose Meza-Sanchez, Michael Morey, Elijah Pascual, Melissa Perez, Victoria Tien, Roberto Trejo, Yosuke Woodruff

**Advisor:** John Larue

**Advisor:** Khalid Rafique

Project ID#: MAE0003

#### CARGO PLANE

This project is meant to design a heavy lift RC airplane that follows the guidelines of the SAE Aero West Regular class competition rules.

**Students:** Edwin Abrahamian, Michelle Antimie, Joshua Bae, Santiago Correa, Robert Foster, Tyler Gorman, Romik Mejlumyan, Ryan Min, Stephanie Pearce, Kelsey Safar, Ziming Sun, Madara Wijetunga

**Advisor:** John Larue

Project ID#: MAE0022

#### CIRCULAR UAV

The objective of this project is to design, build, and fly a demonstration of a circular planform UAV with the Geobat being the first draft.

**Students:** Moses Choi, Zihao Zou

**Advisor:** Haithem Taha

Project ID#: MAE0021

#### EXOSUIT

Exosuit Engineering is geared towards improving the mobility and decreasing the cost of rehabilitative upper arm and shoulder mechanics. In addition, our group is developing methods of upper body strength amplification for high functionality with situations of military and industry application in mind.

**Students:** Alexander Alvara, Mark Jakovljevic, Juan Lopez, Luz Vazquez Sevilla

**Advisor:** David Reinkensmeyer

Project ID#: MAE0004

FLAPPING WING MAV

The project's objective is to design, fabricate, and fly a micro air vehicle capable of hovering. The vehicle has to be less than 15 cm in length, width, and height.

**Students:** Richard Pham, George Saad, Vadim Slyusarchuk

**Advisor:** Haithem Taha

Project ID#: MAE0005

FUEL CELL DATA CENTER

We will improve the energy efficiency and sustainability, reduce pollutant emissions, and eliminate energy grid reliance of data centers using fuel cells, clean renewable energy, and energy storage.

**Students:** Aaron Cheng, Gabrielle Cobos, Michael Crowley, Robert Miller, Allen Schellerup, John Stansberry

**Advisor:** Jack Brouwer

Project ID#: MAE0006

FUEL CELL BATTERY

The purpose of the project is to design and fabricate a self-sustaining cycle using the following main components; fuel cell, solar panel, and electrolyzer.

**Students:** Shengnan Fei, Mehrdad Goshtasbpour Parsi, Michael Morey, Khoi Bao Anh Ngo, Taylor Robertson

**Advisor:** Yun Wang

Project ID#: MAE0024

HYPERXITE

HyperXite is rapidly prototyping a floating vehicle that will accelerate from zero to 219 mph in 5 seconds for the SpaceX Hyperloop Pod Competition.

**Students:** Jiliana Andrews, Gabriel Buenviaje, Anthony Cirillo, Jasmine Cordero, Dean Defuria, Jacob Gantz, Patricio Guerrero Gertz, Margarito Guzman, James Harvey, Austin Johansen, Zepoor Khechadorian, Bander Linjawi, Nima Mohseni, Calvin Nguyen, Gabriel Pillitiere, Eric Romano, Madelyn Sando, Vivian Tseng

**Advisor:** Roger Rangel

Project ID#: MAE0007

FSAE ELECTRIC RACECAR: AR-10 ELECTRA

AR-10 Electra is a multi-disciplinary research and design project which gives students experience designing, manufacturing, testing, and racing a Research and Development prototype open wheel electric racecar for a design competition against universities from around the world.

**Students:** Hanin Alhassan, Mitch Anderson, July Aye, Kathleen Berrio, Liam Buchanan, Josue Chavez, Zach Demotte, Ryan Ehlig, Phillip Friedman, Jessica Frye, Haoli He, John Higgins, Stephen Jan, Kevin Kato, Kenneth Kawanishi, Omar Khan, Changmin Koo, Jordan Lee, Hugo Mendoza, Nghi Nguyen, Ryan Norris, David Reynolds, James Ristrim, Antonio Rojas, Karen Romine, Andres Ruiz, Micah Tamura

**Advisor:** Michael McCarthy

**Advisor:** Philip Chipman

**Advisor:** Robert Smith

Project ID#: MAE0008  
FSAE RACECAR SAVAGE

As part of the UC Irvine FSAE racecar project students design, build, test, and compete with a formula-style racecar in Lincoln, Nebraska as part of the FSAE West competition.

**Students:** Arman Askari, Eli Bartlett, McHenry Carlson, Raymond Chan, Jonathan Chen, Sergio Chen Cheung, Brian Chiu, Matthew Clark, April Craven, Son Dao, Vazgen Frnzyan, Matthew Gill, Kevin Gonzalez, Mina Hanna, Khanh Huynh, Javon Johnson, Ju Hyun Kim, Zachary Kurien, Zonghao Liu, Arnav Malawade, Zachary Milbourn, Tyler Nelson, Khoi Ngo, Andrew Nguyen, Nazneen Peracha, Anthony Pham, Kasthuri Sivagnanam, Michael Song, Antonio Tejada, Kristanto Uisan, Haosen Xing, Sion Yans

**Advisor:** Michael McCarthy

Project ID#: MAE0009  
RACECAR ENGINEERING: BAJA SAE – RAIDER

The Anteater Racing Baja SAE team is to design, engineer, build, test, promote, and compete a single-seat prototype all-terrain vehicle.

**Students:** Luis Ayala, Miguel Blanco, Erik Blaser, Cheri Chomchuensawat, Xavier Dedenbach, Angel Gonzalez, Jacob Gumke, Chirantha Kaluthan, Danny Kim, Jitian Lu, Melvin Lucas, Andrew Marshall, Nawid Mehrzai, Andres Olmedo, Zachary Pearce, John Pena, Mehdi Razouane, Ryan Roach, Kaitlin Robinson, Triet Tran, Tiancheng Wang, Xiaoqian Wang, Kurtis Wragg, Jason Yee

**Advisor:** Michael McCarthy

Project ID#: MAE0010  
RACECAR ENGINEERING: FSAE DELTA CNG RACER

Design, fabricate, and repair a CNG racer that will compete in the UCI Energy Invitationals.

**Students:** Sovan Bopha, Nawid Mehrzai, Brian Pham

**Advisor:** Michael McCarthy

Project ID#: MAE0011  
RACECAR ENGINEERING: SIX BAR SUSPENSION SYSTEM

Design and fabricate a compact long-travel six-bar suspension for Baja application.

**Students:** Yulong Gu, Eric Huang

**Advisor:** Michael McCarthy

Project ID#: MAE0033  
REHAB ROBOTICS - CONCUSSION RESEARCH

Our main goal is to ascertain whether ball inflation pressure, in soccer and water polo, has a significant impact on head acceleration and traumatic brain injury (TBI).

**Students:** Digish Mehta

**Advisor:** David Reinkensmeyer

Project ID#: MAE0012  
REHAB ROBOTICS - THUMB EXOSKELETON

This project's goal is to design a wearable thumb device for stroke patients in rehabilitation be assisted with simple movements the thumb can do, both affordable and accessible for the patient.

**Students:** Emanuel Reyes, Yang Liu, Annie Lee, Han Zheng

**Advisor:** David Reinkensmeyer

Project ID#: MAE0013

#### RESCUE ROBOTICS

Design and implementation of autonomous ground and aerial vehicles capable of finding natural disaster victims and reporting back their pictures and global position.

**Students:** Dan Chen, Bonnie Gonzalez, Dustin Hall, Erin Ho, Lisa Ho, Valerie Martinez, Thuan Nguyen, Anurag Vaddi Reddy, Luis Serrano, Yiqin Tang, Phuoc Vo, Alexander Wang, Cynthia Yang, Nickolas Zurlinden

**Advisor:** Jeff Krichmar

**Advisor:** Ian Harris

**Advisor:** Michael McCarthy

Project ID#: MAE0023

#### ROCKET ENGINE DEVELOPMENT

The project goal is to design and manufacture a hybrid rocket engine with a custom stand to achieve a thrust goal of 1000 lbs for a burn time of 20 seconds.

**Students:** Jolie Bellegarde, Victor Chen, Mingeun Cho, Paul De Mesa, Edgar Delgado, Jim Faber, Itzetzl Frausto, John Huynh, Chu Liu, Anthony Long, Vishnu Maharaj, Bryan Orozco, Lakshan Peiris, Jianan Qu, Tiffany Quach, Danny Zarour

**Advisor:** Feng Liu

Project ID#: MAE0014

#### UCI ROCKET PROJECT

Design a cost effective method (Rockoon) for mesosphere research & CubeSat launch by using balloons to hoist and launch an actively stabilized rocket with a highly efficient lightweight hybrid engine.

**Students:** Alfonso Arreguin, Justin Block, Tai Wei Chen, Sandy Dao, Stefanie Figueroa, Onalli Gunasekara, Jesse Inouye, Taylor Jones, Leann Kampley, Michael Morey, Vishtasb Namiranian, Isaiah Navarro, Justin Oyas, Matthew Preszler, Tarik Snyder, Grant Dang Wu, Yuan Zhang, Aaron Zhong

**Advisor:** Kenneth Mease

Project ID#: MAE0027

#### I.o.Toys

The I.o.Toys project team looks to bridge the digital and physical world through toys by collecting, analyzing, and translating data wirelessly.

**Students:** George Agcogra, Amihan Amargo, Maria Aparicio, Ian Pareja

**Advisor:** Terry Wang

Project ID#: MAE0026

#### SOLAR POWERED AIRPLANE

Solar Airplane is designing and producing a continuously, autonomously-flying solar-powered UAV that will charge during the day and discharge at night, while supporting a one kilogram, generalized technological payload.

**Students:** Callum Lamb, Tri Luong, Sage Thayer

**Advisor:** Yun Wang

Project ID#: MAE0015

#### SOLAR STOVE

Utilizing inexpensive salts readily available today as fertilizer and preservatives, Engineering students at UCI are developing a solar cook-stove that collects and stores solar energy for use in cooking after dark.

**Students:** Nathanael Chan, Victor Chen, Derek Gladstone, Kristen Huey, John Huynh, Katie Kim, Hiroki Nakajima

**Advisor:** Derek Dunn-Rankin

Project ID#: MAE0016

#### SPACECRAFT THERMAL SYSTEMS

The UCI Spacecraft Thermal Management Team is designing a Variable Emissivity Radiator utilizing an electrochromically controlled film to regulate the temperature of a 2-unit CubeSat in polar low earth orbit.

**Students:** David Baltazar, Ethan Boado, Erik Dominguez, Daniel Lapp, Noah McFerran, Pedro Salcedo, Sara Wilman

**Advisor:** John LaRue

**Advisor:** Khalid Rafique

Project ID#: MAE0020

#### THERMAL ENERGY

To develop a solar thermal energy storage system that collects and stores solar radiation to generate electricity.

**Students:** Santiago Correa, Erik Dominguez, Shengnan Fei, Mehrshad Haghi, Justin Hill, Ronnel Jamir, Boxuan Ju, Ho Kyoung Lee, Juexiao Ning, Andre Plagata, Carlos Rodas, Erick Sarco, Zhe Shi, Justin Wong, Yang Yue

**Advisor:** Yun wang

**Advisor:** Jaeho Lee

Project ID#: MAE0025

#### TRIBOELECTRIC ENERGY HARVESTING

To develop a practical use of triboelectric materials that can be implemented in high volume to generate energy from current everyday activities.

**Students:** Pavitpal Bhatia, Joseph Garcia, Theron Smith

**Advisor:** Farzad Ahmadkhanlou

Project ID#: MAE0017

#### UAV FORGE

We design, build, test, and fly unmanned aerial vehicles dedicated to autonomous remote surveillance.

**Students:** Nathan Brannon, Patrick Canler, Richard Carles, Ryan Chan, Tina Chan, Allen Chang, Steve Cho, Karen Chu, Matthew Craven, Hugh Dang, Riley DeGhionno, Harit Desai, Jordan Dickson, Ali Hashemi, Kelly Ho, Daniel Huynh, Jevons Jiang, Cameron Kennedy, Aaron Ko, Kyle Lam, Tuan Lam, Albert Lau, Dale Lee, Sergio Linares, Rio Menchaca, Jongmin Mun, Syed Mustafa, Vishtasb Namiranian, Kendrick Ngor, Daniel Ortega, Kevin Phan, Elliot Rhee, Canyon Riley, Iniyavan Sathiamurthi, Noel Shamoan, Chris Tan, Vincent Tran, Thi anh Tran, Alvin Truong, Mansi Tyagi, Max Uzoukwu, Adrian Velasco, Jason Watkins, Joshua Watkins, Cheng Ye, Jesse Yin, Raymond, Yu

**Advisor:** Haithem Taha