TONY HUA

MECHANICAL ENGINEERING | AEROSPACE ENGINEERING

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EDUCATION

STANFORD UNIVERSITY (Stanford, CA) 2014 – Present

Related courses: Programming Methodology, Product Design Sketching, Visual Thinking, Solid Mechanics, Computation and Visualization, Thermodynamics, Fluid Mechanics, Dynamics, Electronics and Arduino Programming, Computer Consulting, MEMS Manufacturing, Heat Transfer, Mechanics of Materials

RELEVANT EXPERIENCE

NASA JET PROPULSION LABORATORY (PASADENA, CA): Mechanical Engineering Intern, June 2016 – September 2016

- Designed and prototyped a low mass, low actuator containment and sterilization concept for breaking the chain of contact between Earth and Mars to prevent back contamination in a Mars Sample Return mission. Out of five contracted teams tackling this problem, my presented design is currently one of two top contenders down selected for further refinement and continuation.

STANFORD SOLAR CAR TEAM (STANFORD, CA): Aerodynamic Team Member, February 2016 – Present

- NX surfacing of potential car shell designs to reduce drag coefficient. Also offered to mentor/teach NX to new members.

STANFORD UNIVERSITY DGEN OFFICE (STANFORD, CA): Graphic Designer, February 2016 – Present

- Created flyers, logos, webpages, and promotional social media content that significantly increased event attendance/publicity

OCEANLAB AQUATIC SWARM ROBOTICS (GLENDALE, CA): Mechatronics Intern, June 2015 – September 2015

- Increased speed and maneuverability of aquatic swarm vehicles with redesigned motor and electronics housing via Solidworks
- Improved GPS locking time by saving the last known location, testing/debugging of autonomous swarm algorithm.
- Made custom Arduino based water current and weather data collection instruments for vehicles, collected data at Catalina Island
- Learned CADsoft EAGLE PCB board design and debugged test vehicle circuit boards after water failure

NASA JET PROPULSION LABORATORY (PASADENA, CA): Mechanical Engineering Intern, June 2013 – August 2013

- Solved delamination and corner bunching issue to accommodate for material thickness when designing panel spacing for origami solar array and similar flexible deployables. Also improved prototyping process, producing 4 arrays in same time it used to create one.
- Designed/prototyped actuation concept and compliant bi-stable locking mechanisms: circular truss, tapestring, shape memory alloy, cable tension driven, pneumatic actuation, metallic glass bearings and hexfoil springs.

NOTABLE PROJECTS

ELECTRATHON HIGH EFFICIENCY ELECTRIC VEHICLE: South El Monte High School, 2014

- Led 12 person team and oversaw project timeline and objectives for 2 more individual sub teams.
- Taught CAD drafting, electrical wiring, and machining skills for cutting and welding the structural frame, installing the drive train, etc

SINGLE SEAT SOLAR POWERED BOAT (1st Place): South El Monte High School, 2012

- Led 20 person team to design and build the hull, steering system, drivetrain, and motor mount for a solar powered electric boat. Also wired together solar cells and the electrical system, including kill switches and motor/electrical controls. Entire boat was built from scratch: from pieces of plywood to a working boat.
- Wrote grant letters and held presentation meetings with local businesses for project sponsorship, grants and technical support.
- Awarded 1st place for technical reports, endurance, sprint, and overall for 2012 Solar Cup competition. On newspapers all over California

ORIGAMI INSPIRED DEPLOYABLE SOLAR ARRAY: NASA Jet Propulsion Laboratory, 2012

- Design/prototyped a solar array capable of deploying from stowed diameter of 2.7m to 25m, about 10x its size via origami
- Conceived a mockup with a tapespring and circular truss actuation method, including alternative variants incorporating shape memory alloys, centripetal acceleration, and pneumatic expansion as an actuation device.
- Modified design to accommodate material thickness for a smoother deployment and refined the assembly process with new techniques and materials. Effectively improved prototyping process to create 4 arrays in the time it used to make 1.

VEX ROBOTICS / AUTONOMOUS KAREL PROJECT: Stanford University, 2014

- Selected by club to present at Maker Faire: We created a robotic test bed that allowed students to test their JAVA scripts for autonomous movement. Wifi connectivity allowed for any student to simply upload their code.

SKILLS

CAD SOFTWARE: SolidWorks, NX Unigraphics, Inventor, AutoCAD, AutoCAD Electrical, Revit, Coventor, CADSoft EAGLE PCB Design

PROGRAMMING LANGUAGES: PERL, Unix, Java, MATLAB, LaTeX, C++, AHK

DESIGN SOFTWARE: Microsoft Office, Microsoft Project, Photoshop, After Effects, Premier, Illustrator, Flash

OTHER SKILLS: Machine/wood shop tools, CNC Machinery, Laser Cutting, 3D Printing, Composite layering, Complaint Mechanisms, Origami Deployables, Car maintenance, PCB breadboard layout, Photolithography, Plastic welding, Grant writing

OTHER ACTIVITIES AND EXPERIENCE

COMPUTER CONSULTANT / RESIDENTAL ASSISTANT: Stanford University (Stanford, CA) June 2016 – Present

- Provide support and supervision for incoming students. Act as a mentor and role model for underclassmen. Provide technical support for electronics and connectivity within the dorm. Manage and maintain dorm electronics and computer cluster.

VOLUNTEER: Doors of Hope (Pasadena, CA) June 2013 – September 2014

- Built and repaired homes for homeless families. Organized fundraising events in support of homeless aid organizations

EMBROLOGY RESEARCH INTERN: UCD Ross Laboratory (Davis, CA) June 2012 – August 2012

- Researched bovine oocyte maturation via bioinformatics approach using Perl and Unix scripting language. Performed gene expression profiling with RNA-seq, followed by miRNA quantification using TaqMan microRNA arrays. Observed correlations between miRNA presence and post-transcriptional regulation of maternal mRNA. Submitted paper to PNAS Journal and presented at research symposium

SALES REPRESENTATIVE: SGN Nutrition (Hacienda, CA) June 2014 – September 2015

- Persuaded clients to buy product. Tops sales representative for two months in a row and offered a position to perform traveling demos.

COCHAIR/FOUNDER: Stanford Lion Dance (Stanford, CA) June 2015 – Present

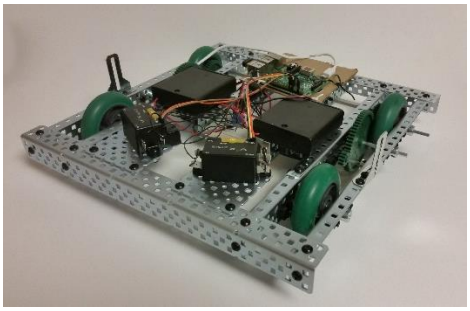
- Organized practices, schedule performances, choreograph routines and stunts, oversaw general group activities. Acquired funding through Stanford's ASSU and Spark's grant. Acquired partnership with FEDLA in San Jose.

COCHAIR: Stanford Vietnamese Student Association (Stanford, CA) June 2015 – Present

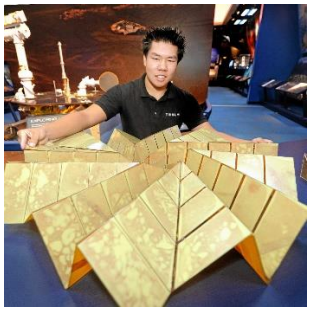
- Organized and led Stanford's Mid-Autumn and Lunar New Year Festivals: booked performances, venues, programming, food, publicity, and volunteers. Oversaw volunteer placement and delegated tasks for interns.

GALLERY

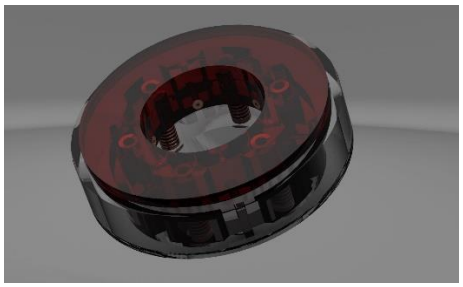
Single Seat Solar Powered Boat



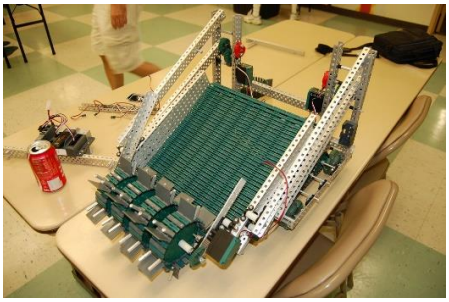
Autonomous Karel Robot, VEX Robotics



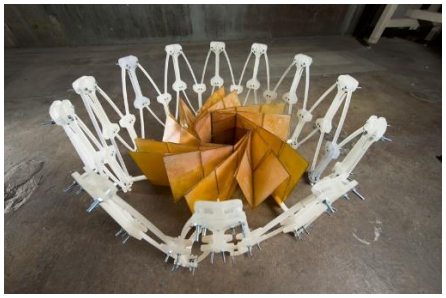
NASA Origami Inspired Deployable Solar Array



NASA Mars Sample Return Sealing Assembly



Autonomous VacuumBot, VEX Robotics

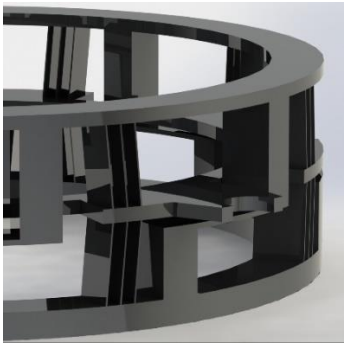


NASA Origami Solar Array w/ Circular Truss

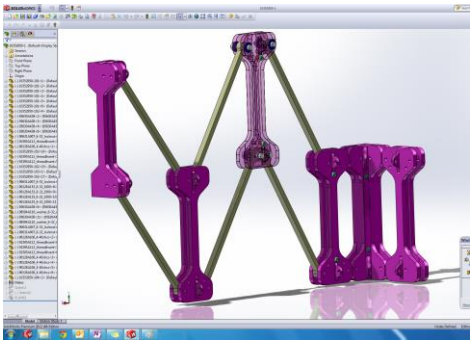
Swarm Algorithm Testing

Electrathon High Efficiency Electric Vehicle Frame

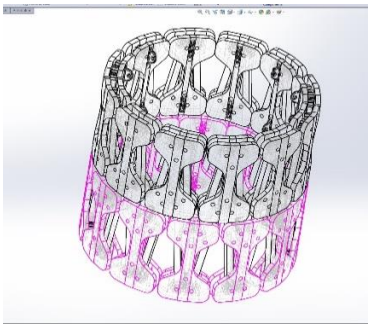
Lion Dance Costume Bamboo Frame



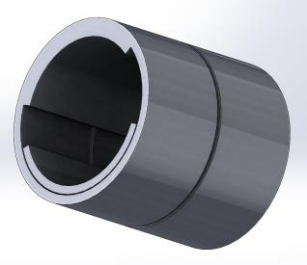
Bi-Stable Bearing Active Preload System



Square Perimeter Truss

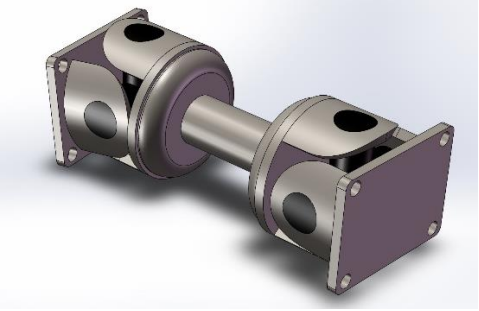


Deployable Circular Perimeter Truss



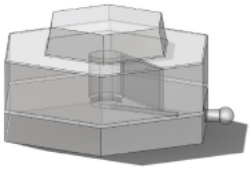
Tubular Cross Axis Flexure

Hexfoil Bi-stable Spring



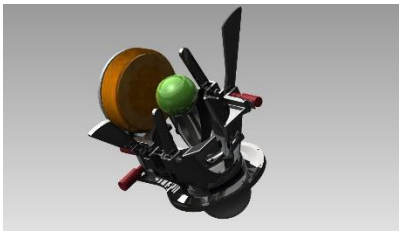
Drive Shaft

Base Plate

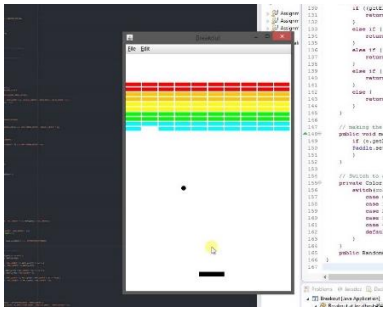


Centripetal Spring Deployment Base

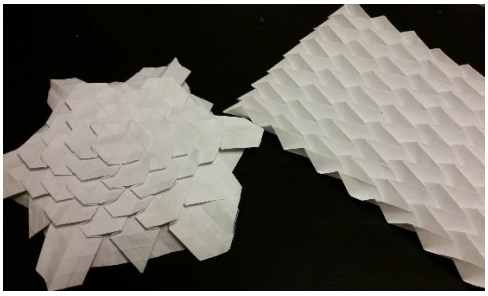
Samsung Galaxy S5 + Custom Cases



NASA Mars Sample Return: BTC Payload

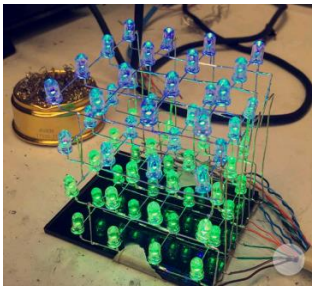


JAVA Breakout Game



Origami Tessellations

Lion Dance Performance



Audio Reactive LED cube

Graphic Design: Event Flyers