

CSTEP 2017 Summer Undergraduate Research Program (CSURP) Book of Abstracts

Undergraduate Researcher	Faculty Mentor	Department	Project Title
Sharif Aris	Phillip Anzalone	Architectural Technology	Integrating Mathematics & Digital Manufacturing
Fatoumata Camara	Gaffar Gallani	Mechanical Engineering Technology	Deformation of Articular Cartilage
Brandon Dingle	Xiaohai Li	Computer Engineering Technology	Embedded Multi-Media Player
Stefan Falciglia	Douglas Moody	Computer Systems Technology	Assessment of Learning Strategies for Computer Programming Pedagogy
Kayla Ford	Douglas Moody	Computer Systems Technology	Assessment of Learning Strategies for Computer Programming Pedagogy
Darius Freeman	Benito Mendoza	Computer Engineering Technology	Developing IoT Services & Applications
Kristopher Garay	Masato Nakamura	Mechanical Engineering Technology	Energy & Environmental Simulation Laboratory
Tanya Granados	Jerron Smith	Communication Design	User Research Methods To Design A Penny Stock App.
Harrys Hougbedji	Farrukh Zia	Computer Engineering Technology	Pill Detector
Kyaw Htun	Navid Allahverdi	Construction Management & Civil Engineering	Structural Concrete Produced From Recycled Materials
Mazharul Islam	Douglas Moody	Computer Systems Technology	Assessment of Learning Strategies for Computer Programming Pedagogy
Jane Lynnel Ladaban	Xiaohai Li	Computer Engineering Technology	Modular Multi-Rotor Aerial System
Gamal Mansour	Andy Zhang	Mechanical Engineering Technology	Design & Fabricate A Low Cost RC Car
Shazeda Omar	Ralph Alcendor	Biological Sciences	The Role of Sirtuins in <i>T.thermophila</i>
Damar Saul	Ozlem Yasar	Mechanical Engineering Technology	Elevator Staging System for Photolithography
Jitendra Singh	Ralph Alcendor	Biological Sciences	Effect of Oxidative Stress on <i>Tetrahymena thermophila</i>
Mathew Tackett	Ralph Alcendor	Biological Sciences	Effect of Oxidative Stress on <i>Tetrahymena thermophila</i>
Sergio Vazquez Cortes	Navid Allahverdi	Construction Management & Civil Engineering	Building Into The Future: Reinforcing Construction in New York City After Superstorm Sandy

Sharif Aris

Integrating Mathematics & Digital Manufacturing

Mentor: Professor P. Anzalone

Department: Architectural Technology

In the course of architectural practice, architects are often required to obtain approval through engineers for building structures. The parameters the engineers work with are related to the strength of the structure, which is a quantitative function. On occasion engineers need to advise the designer that their design is not structurally stable and would have to revise it. Architects operate not only in the functional parameters of the strength of the building, but also in the qualitative area of aesthetics and design. Optimizations by the engineer can often change the design radically and possibly ruin the architect's objective goal. Through the use of a combination of Mathematica, mathematical software made to work with functional parameters through algorithms; Rhino, a three dimensional solid modeler that can import parametric data; and digital manufacturing, architects will be able to master and identify the faults within their design, streamlining the communication with the engineers. With this process manufacturing, planning and production of design are enhanced and achieve increased efficiency, particularly in areas such as building envelope design, where both functional and subjective goals overlap. This project seeks to explore this production pipeline through the study of a parametric panel on the building envelope.

Fatoumata Camara

Deformation of Articular Cartilage

Mentor: Professor Gaffar Gallani

Department: Mechanical Engineering Technology

This project was study of the theoretical deformation of articular cartilage due to stress loading, singular loading and stress relaxation. Equations for compressible and incompressible models developed from previous work using Matlab, will be implemented. Results were compared to published experiments.

Brandon Dingle

Embedded Multi-Media Player

Mentor: Professor Xiaohai Li

Department: Computer Engineering Technology

A multi-media player was created sing Rasberry pi & Linux, that is able to have external sources such as a SD card, keyboard and more.

Stefan Falciglia

Assessment of Learning Strategies for Computer Programming Pedagogy

Mentor: Professor Douglas Moody

Department: Computer Systems Technology

The project assessed how various tools can be used to teaching fundamental programming skills. A tool in development was evaluated for its usefulness and effectiveness.

Kayla Ford

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Darius Freeman

Developing IoT Services & Applications

Mentor: Professor Benito Mendoza

Department: Computer Engineering Technology

The Internet of Things (IoT) is said to be the next great Industrial Revolution. The IoT revolves around increased machine-to-machine communication. It is fostered on cloud computing, and consist of networks of data-gathering sensors, or things, embedded in the environment such as buildings, vehicles, factories, and roads, which are armed with mobile, virtual, and instantaneous network connection that enables them to collect and exchange data in real time. Researchers say that IoT will make everything in our lives, from streetlights to factories, to seaports, smart. However, developing for the IoT is a complex undertaking, it is hard to start from scratch. Given the potential impact, many tech companies (big and small) have developed their own IoT platforms. IoT platforms provide a jumping-off point, combining different tools needed to handle the deployment of applications, including device management and data prediction and analytics into one service. Providers of platforms include hardware vendors, connectivity providers, and system integrators. The goal of this project was to illustrate how someone with little to no prior engineering or computer science experience can get started on their own IoT projects. We explored the vast IoT platforms arena. We selected an affordable one (hardware and software) with cloud and mobile capabilities out of the box that can be used to create scalable IoT products and services

Kristopher Garay

Energy & Environmental Simulation Laboratory

Mentor: Professor Masato Nakamura

Department: Mechanical Engineering Technology

This research entailed finding better ways of creating and storing energy, researching environmental engineering and ecodesign, and computing sustainability.

Tanya Granados

User Research Methods To Design A Penny Stock App.

Mentor: Professor Jerron Smith

Department: Communication Design

Millennials are the largest population group currently not investing in the Stock Market. This leads to overlooked gains that can be substantial over time. For example, compound returns, a better quality of life in the future and an overall improvement and control of personal finances are all possible rewards from investing in stocks. The focus of this research project was to identify whether giving Millennial's a more efficient tool for investing will create greater interest for a target market that knows little about finance. During the course of this investigation, we have used a variety of research methods, common to the user experience design discipline. These diagnostic tools allow us; to map how the user interacts with the various functions of the app, build profiles of our users with similar needs and behaviors to our target group, and perform one on one observations that let us study how the user interacts with the app. Through our research, we have found that Millennials tend to be risk averse, due to lack of funds, general understanding, and interest. With these findings, we are able to design an app that addresses these main pain points and ultimately be a starting point for brainstorming solutions.

Harrys Hounbedji

Pill Detector

Mentor: Professor Farrukh Zia

Department: Computer Engineering Technology

This project involved design of an algorithm that can detect medication pills and differentiate each pill individually.

Kyaw Htun

Structural Concrete Produced From Recycled Materials

Mentor: Professor Navid Allahverdi

Department: Construction Management & Civil Engineering

This research investigated the possibility of using recycled materials as substitutes for commonly used concrete ingredients. The recycled ingredients include crushed waste glass, recycled waste concrete, and blast furnace slag. The main goal of the research was to examine how concrete properties changes as common ingredients are replaced by recycled materials.

Mazharul Islam

Assessment of Learning Strategies for Computer Programming Pedagogy

Mentor: Professor Douglas Moody

Department: Computer Systems Technology

The project assessed how various tools can be used to teaching fundamental programming skills. A tool in development was evaluated for its usefulness and effectiveness.

Jane Lynnel Ladaban

Modular Multi-Rotor Aerial System

Mentor: Professor Xiaohai Li

Department: Computer Engineering Technology

The goal of this project was to design and develop a modular multi-rotor aerial system that is based on an engineered open autopilot firmware. We engineered and customized the firmware to enable it to adaptively adjust the configuration of multiple rotor designs for different modular mechanisms. The system provides a versatile and robust solution for the platform development.

Gamal Mansour

Design & Fabricate A Low Cost RC Car

Mentor: Professor Andy Zhang

Department: Mechanical Engineering

The computer aided software packages Autodesk Inventor or Solidworks were used to design a computer model of a car. Rapid prototype equipment such as waterjet and 3D printers were used to fabricate the needed components for the low cost RC car.

Shazeda Omar

The Role of Sirtuins in *T.thermophila*

Mentor: Professor Ralph Alcendor

Department: Biological Sciences

Sirtuins and their activities on *T.thermophila* in a school lab setting were examined.

Damar Saul

Elevator Staging System for Photolithography

Mentor: Professor Ozlem Yasar

Department: Mechanical Engineering Technology

Student will design and fabricate the elevator staging system for photolithography.

Jitendra Singh

Effect of Oxidative Stress on *Tetrahymena thermophila*

Mentor: Professor Ralph Alcendor

Department: Biological Sciences

Sirtuins and their activities on *T.thermophila* in a school lab setting were examined.

Mathew Tackett

Effect of Oxidative Stress on *Tetrahymena thermophila*

Mentor: Professor Ralph Alcendor

Department: Biological Sciences

Sergio Vazquez Cortes

Building into the Future: Reinforcing Construction in New York City After Superstorm Sandy

Mentor: Professor Navid Allahverdi

Department: Construction Management & Civil Engineering

This project examined what is being done regarding the construction of buildings and infrastructure to resist floods, surges, high winds and heavy rain.