ANDREW YAN | PROJECTS

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MORE INFORMATION FOR ALL PROJECTS: https://andrewyan.ca/projects.html

ENVIRONMENTAL ENCLOSURE FOR A SINGLE CELL INKJET PRINTER

CAPSTONE PROJECT   SEPT. 2019 - PRESENT

Summary: The main goal of this project is to design and build a strictly controlled environmental enclosure to complement the existing single-cell inkjet printing system of the BioMEMS Lab. This is necessary to mitigate the negative impacts of the environment on biological samples and to allow downstream analysis for future end-users. Upon completion, this project will serve as an initial prototype with fully integrated humidity, temperature, and sterility control systems; it will act as supporting equipment for the single-cell isolation printer.

Pictures, Documents and More Information: https://andrewyan.ca/enclosure.html

SLEEP SWEET

nwHACKS 2020 PROJECT   JAN. 2020

Summary: This project was aimed at reducing the impact of sleep inertia, the drowsiness that most people feel when woken up in the wrong sleep cycle. A smart alarm was created using an accelerometer, noise sensor and Arduino that was successfully able to respond to motion and noise within the environment. Further plans were also identified and displayed to the hackathon judges.

Pictures, Documents and More Information: https://andrewyan.ca/nwhacks2020.html

LASER LIGHT SHOW

3RD YEAR DESIGN PROJECT   JAN. 2018 – MAY 2018

Summary: The goal of this project was to design and build a 2 degree of freedom spherical wrist that included 2 mechanically commutated, permanent magnet DC actuators that could draw shapes on a wall. This was done for a third-year project course, and was completed using tools such as SolidWorks, Altium Designer, MATLAB and Simulink. The final product had a custom control system (which was initially modelled in Simulink) running on an Arduino attached to custom PCBs. The final design allowed the laser to draw a circle and a square on the wall with the motors operating at an oscillation frequency of 10 Hz.

Pictures, Documents and More Information: https://andrewyan.ca/lightshow.html

RC4 DECODER

DIGITAL SYSTEMS DESIGN PROJECT   NOV. 2017

Summary: The goal of this project was to replicate the basic RC4 decryption algorithm in SystemVerilog such that it could crack any message in which all the letters are lower-case letters or spaces. This was primarily done using a state machine, and multi-core processing was implemented using the start-finish protocol for faster decryption times.

Pictures, Documents and More Information: https://andrewyan.ca/decoder.html

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SLAPP

LUMOHACKS 2017 PROJECT
SEPT. 2017

Summary: The goal of this project was to come up with an alternative to sleep tracking methods that doctors currently use, which requires the patient to manually record sleep times. The solution was to implement a mobile and web application that allowed the patient to easily track sleep with a single click of a button and allow the doctors to access the information in real-time. The judges determined that this project ranked top 15 out of 60 projects that presented at Lumohacks 2017.
Pictures, Documents and More Information: https://andrewyan.ca/lumohacks2017.html

REFLOW OVEN CONTROLLER

2ND YEAR DESIGN PROJECT
FEB. 2017

Summary: The goal of this project was to convert a standard toaster oven into a reflow oven using simple electrical components. A thermocouple was used to measure the temperature within the oven, and an AT89LP52 microcontroller was used to control the system. The completed system was then used to solder components for an F38x microcontroller PCB.
Pictures, Documents and More Information: https://andrewyan.ca/reflow.html

MUSIC TO MOVEMENT

UBC BEST PROJECT
JUNE 2016 – DEC. 2017

Summary: "Approximately 800,000 people suffer from a stroke each year; about one every four seconds. Suffering a stroke results in the weakness and or loss of function in the body. Often times, those who have suffered from a stroke undergo a repetitive rehabilitation process in order to recover important daily functions. Music to Movement is a student body led initiative aimed at developing an assistive music therapy device that creates a more motivating and engaging experience towards recovery. Two years since inception, Music to Movement has emerged through the collaboration of all the sub teams of UBC BEST, and the extensive research and guidance from our partnered music therapists. Along with strong continued development, M2M has been featured as finalists at the MDDC Awards for Excellence in Biomedical Engineering Design and Innovation as well as for the RESNA (Rehabilitation Engineering and Assistive Technology Society of North America) Student Design Competition Award." – www.ubcbest.com
Pictures, Documents and More Information: https://andrewyan.ca/M2M.html

IDEA-EMR

UBC BEST PROJECT
SEPT. 2015 – JUNE 2016

Summary: The goal of this project was to replace paper-based emergency medical record systems in Kenya and Uganda, which were easily lost and inefficient for doctors. The project was developed on Android Studio and was eventually handed off to a Canadian non-profit organization called ICChange. ICChange used the project to study emergency room trends and eventually implemented the application in various hospitals in the region.
Pictures, Documents and More Information: https://andrewyan.ca/IDEAEMR.html