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INTERESTS

Working on intelligent embedded systems with a hardware and software bend to them. Building Internet of Things (IoT) systems and devices for consumers are of special interest to me. To enable IoT, I want to learn about computer architecture and chip design, and discover their relationship with software, with the goal of developing new solutions to real-world problems.

EDUCATION

Bachelor of Science, Electrical and Computer Engineering, May 2019

RELEVANT COURSES

Intro to Computing Systems, Intro to Electrical Engineering- Circuits I, Multivariable Calculus - Sequences and Series, Differential Equations, Linear Algebra- Matrices, Intro to Embedded Systems

WORK EXPERIENCE

2013 - 2015 **Co-Founder at** Concerto Innovations **Inc.**

- *Market*: There are 15 million blind people in the United States
- *Problem*: Blind people usually use canes, but canes cannot sense moving objects, objects above the waist, overhanging objects
- *Solution*: The product uses ultrasound as a range sensor that delivers a haptic feedback inversely proportional to the distance of an object
    - Made production prototype models and distributed them for trial to the members of the National Federation of the Blind
    - Received acclaim from the NFB Dallas Area President, Rhanda Hasley, who tested the initial product herself
    - Cofounded Concerto Innovations startup 2013, filed as an s-corporation with IRS 2014. (Filed as a minor, so it is under the name of Swaminathan Balasubramanian on the IRS catalog of s-corporations)

2014 - 2016 **Founder at** ZEPHYRA **Inc.**

- *Market*: People who want to listen to music with their headphones in and lie down on their side at the same time
- *Problem*: Too uncomfortable, headphones get jammed into the ear
- *Solution*: Memory foam pillow with dual functionality: A slot in the memory foam designed to separate out the treble and bass, delivering sound clarity
    - Dual functional so that someone can put the headphones directly in their ear and lay comfortably on the side (pending patent)
    - Filed as an s-corporation with IRS as of August 4, 2014

- Over $1,000 so far in sales (by only word of mouth) in the month of February, 2016 itself (this document was last updated on February 15, 2016. Currently making additional sales on Amazon (type Zephiyra to purchase one now).

INVITED TALKS

March 2015 **Invited to give a Presentation/Talk at the TiE/TYE Dallas Young Entrepreneur Workshops**

- Presented the process of R&D for Zephiyra Inc. and Concerto Innovations and my experience manufacturing overseas, hiring customs agents, hiring models, testing the market, and the process of applying for a patent and trademark.

January 2015 **Invited to pitch and discuss my company, Zephiyra Inc with CEO of Nathan Research Inc.**

- Presented market, GTM strategies, and market validation for product
- Received acclaim for the product and made my first sale here.

PROJECTS

2014 **Wireless Robotic Arm of 3DOF**

- Built a wireless robotic arm that mimicked movement of my arm
- Used a series of gyros (I^2C interface) to measure the angular acceleration of the human joints and wirelessly transmitted those values using an RFduino bluetooth interface to motors (PWM) that drive the synthetic arm
- Used LDR (light dependent resistor) and LED to translate the distance between the sensors to a claw pinch motion that used a micro servo and opposing gears to run the synthetic claw
- 3D frame and appendages with Inventor Fusion to make CAD design
- https://www.youtube.com/watch?v=UY_fGaMc99A

2014 **ALS Ice Bucket Challenge Automation**

- Took the ALS Ice Bucket Challenge to the next level by creating an ALS “machine” that was fully automated
- When someone steps under the bucket, the ultrasound will detect them in range, send a signal through a microcontroller to a DC motor (attached to a string and pulley) that when run, the string will get pulled and tip the bucket filled with water onto the recipient’s head
- Once the person is out of range again, the motor will reset, the relay is switched, and a water pump will pump water back into the bucket
- Ultrasound will then start detection for the next person to step under
- Had about 24 hours to do the challenge once nominated.

Current **Digital Logic Circuit and PCB design for a BLDC Motor Driver**

- Designed logic circuit using “Eagle” for a BLDC driver using logic ICs
- Configured the initial algorithm to calculate the next state in sequential logic to drive the BLDC motor currents and implemented it with the DRV8332 driver.

Design a 12DOF Humanoid Legs (for carrying designated payloads)

- Using Inventor Pro CAD and paper design, modeled two humanoid legs with BLDC motors, 64:1 gear ratio gear boxes, bevel gears, and ball bearings

- Designed the legs in a way that the pelvis joint mimics a ball-and-socket joint
- Building the mechanical design using high torque servos for rotation, embedded systems, and making control algorithms. BLDCs used for next model.

LEADERSHIP

2015 **Founder and President at Unconditional Student Foundation**

- Started philanthropic organization in 6th grade in my Sunday school and expanded it to a school club at Jasper High School
- Expanded to five other schools with over 120 participants: Jasper High School, Plano Senior High, Plano West Senior High, Heritage High, and Centennial
- Led and appointed the board members that consisted of the presidents from each of the different school chapters
- The organization targets the NHS student market, and organizes volunteering projects for hands-on and close volunteering experiences
- Projects include playing music and spending time at the senior homes (Heritage Manor Healthcare Center mainly), gathering students to create holiday cards for children in hospitals, raising funds for Ryan's Well Foundation and UNICEF, spending time teaching autistic children, cleaning up public locations and parks
- Now retired from the board, but have a voice in who gets appointed next president and ideas for upcoming projects.

2013-2015 **Co-Founder and Co-President at USF Socratic Organization**

- This school club was a spinoff of the traditional Unconditional Student Foundation (USF) school club
- Instead of volunteering, the Socratic organization allows for a philanthropic mindset to be encouraged through philosophy
- The unique part is not just its debating concepts, but actually getting to act things out and gather data by doing various thought experiments
- Mostly autonomous from, but still a sister organization of the Unconditional Student Foundation.

October, 2014 **Production of Arabian Nights**

- Organized a team to create a dance production of Arabian Nights for my dance school, Srutilaya Performing School of Arts. Over 450 hours put into planning and putting together the music, and choreographing the dances
- Experienced in delegating work, leading team, and leadership in stage presence
- Held at the Granville Performing Arts Center on 10/11/14
- 14 years of experience in the Indian classical style of dance
- The Production of Arabian Nights raised funds for CHAART as well as the National Federation of the Blind.

March, 2012 **Organized and led organizational teams for a 5K walk fundraiser for IMHO**

- Voted to lead and organize a 5K walk fundraiser for IMHO. Raised $6,200 with 250 participants

- Gained experience in delegating/leading multiple teams, dealing with discrepancies and conflicts between teams, and leading all the teams to work cohesively for one event
- Teams included PR, marketing, sponsorships, logistical, financial, volunteer designation, and liabilities
- Won acclaim from the Sastha Tamil Foundation.

2013-2016 **Started Summer Studio Art and Design Workshop**

- During the 11th grade summer, I started a 2D studio art workshop for little students from 5 years and above.
- Each class lasted 2.5 hours, twice per week.

SKILLS

Proficient in French (6 years)

- 2nd place in State Texas French Symposium for Extempore Speaking (2014) (competed against native speakers)
- Ranked 7th in State Texas French Symposium for Prose Event (2014)
- Top 7% score in the National French Contest (Le Grand Concours-2012.

Proficient in CAD Using Inventor Pro and Inventor Fusion

- Used for the Wireless Robotic Arm, ALS Ice Bucket Challenge, Blind Aid, 12DOF Humanoid Legs, and other small projects.

Art Distinguishments

- Work featured and displayed at the Dallas Museum of Art
- 1st place in Choice Award at the Dallas Museum of Art
- Qualified and perfect score at the State VASE Competition
- 2nd place at the State Texas French Symposium Competition for Art Event
- Broke to State Finals for Texas French Symposium for Oil Paint Event
- 2nd place in district Fête Français Competition
- Recognition Award for Youth Art Month (YAM)
- Selected to go to Summer Institute for Gifted and Talented Students in 4th grade (2006) for 2D drawing and sculpture
- One of few to qualify and enter Junior VASE in middle school.

Basic PCB design using Eagle Software

- Used to make basic digital logic circuit design for BLDC driver
- Other digital circuit designs.

Currently Learning C and ARM Assembly

Volunteering

- 694 total volunteer hours