Paul (Sze Hou) Loh

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EDUCATION

Georgia Institute of Technology *Aug 2018 – Dec 2022 (Expected)*

BSc in Mechanical Engineering, Minor in Computer Science & Intelligence

- GPA: 3.94/4.00, Faculty Honors, Dean's List
- **Engineering Coursework**: *Fluid Mechanics, Thermodynamics, Deformable Bodies, System Dynamics, Computing Techniques, Engineering Graphics, Dynamics, Signal Processing, Signals and Systems, Digital Design, Statistics*
- **Computer Science**: *Object Oriented Programming, Data Structures & Algorithms, HW/SW Systems, Machine Learning*

WORK EXPERIENCE

TESLA, INC | Cell Engineering Intern – Abuse Test & Engineering, Battery Safety *Feb 2021 – Jul 2021*

- Designed and manufactured high pressure, high temperature, 300L mechanical test fixture in 3D CAD software (CATIA).
- Reduced turnover time for battery cell testing iterations by 80% through developing new test methodologies.
- Utilized FEA and DFM techniques to verify constraints of designs are met, reduced cost by 50% and build time by 33%.
- Innovated and reduced risk of flames from cell design by 80% with technical engineering analysis derived from 90 test iterations.
- Researched and created new techniques to observe and analyze potential issues with battery cell from 20 iterations and 4 designs.
- Managed multiple vendors, fabrication shops as well as project management with technicians throughout product development.

DELOITTE CONSULTING | Analytics & Cognitive Intern *Oct 2020 – Dec 2020*

- Mapped source to target documents for clients by deriving 100+ relations between databases in SQL & Talend.
- Coordinated meetings with clients to provide consulting service for automation of 10 processes throughout 6 countries.
- Specified 50+ business logics, input and relational outputs as breakdown for logistical processes to be automated via software.
- Designed and built intelligent automation for imaging and logistics processes for client using BluePrism using OCR technology.

PARKIT | Sourcing & Operations Intern *Jul 2020 – Aug 2020*

- Implemented flow chart mapping of client facing payment system through Stripe integration, assisting company's expansion.
- Increased customer retention by 30% with additional payment options to reduce friction during consumer usage of service.
- Provided data insight to increase sales and revenue by 10% through software analysis of future cash flow and equity.
- Reduced 60% of processing time during transition of product data by automating the operation process.
- Assisted to declutter 100+ process operations which reduced customer dissatisfaction by shortening process time.

INTEL CORPORATION | SSD Validation Engineering Intern *May 2019 – Jul 2019*

- Analysed experimental board that successfully reduced total validation procedure duration by 10 hours.
- Observed and analyzed 17 validation process (I2C, DRAM, crystal, BIST, V, I) on 10 solid state drives.
- Reduced operation time by 5% by restructuring inventory of 400+ test drives for more efficient and reliable access to testing.
- Reviewed engineering drawing and designs of 90+ components to ensure adherence to product testing specification standards.

RESEARCH

Advanced Organic Carbon Cathode Electrodes for Lithium-Ion Battery Storage *Aug 2021 - Present*

Energy Storage and Conversion Laboratory (ESCL), Dr. Seung Woo Lee

- Organic polymers used as alternatives will reduce cost per kWh of LIBs and reduce reliance on rare earth materials (Ni, Co).
- Synthesized carbon dots (CDs) based Covalent Organic Frameworks (COF) to increase energy density of cathode electrodes.
- Experimented, identified, and compared life cycle and stability of 4 different organic polymers as active material in electrodes.

High Power Density Thermoelectric Generator *Aug 2021 - Present*

Scalable Thermal Engineering Lab (STEEL), Dr. Michael Adams

- Generated models for various polymers and metals to identify range of highest power density through Seebeck Effect.
- Utilizing new polymers for p-n components to adapt for new radial design that could potentially absorb heat from core.
- Combined best metals and p-n components to maximize highest power density to create proof of concept for ASME Power 2022.

Nanofibrilated Cellulose and Applications in InGaN Solar Cells *Jan 2020 – May 2020*

French National Center for Scientific Research, CNRS-UMI 2958, Prof. Jean-Paul Salvestrini

- Characterized 3 cellulose fibre types for potential holder after mechanical liftoff in InGaN solar cell substrate.
- Evaluated research papers to identify materials that might provide value as a substitute for current cell technology.
- Presented findings and suggestions of current solar cell technology to promote energy conversion.
- Trained on lithography and metal atomic layer deposition of solar cells in ISO 5 cleanroom classification.

Electrolyte Melt Infiltration of Solid-State Lithium-Ion Batteries *Jan 2019 – May 2019*
Nanotech Lab, Yushin Group, Dr. Kostiantyn Turcheniuk

- Assisting with electrode research on batteries by focusing on replacing liquid electrolytes with solid state electolytes.
- Created 2 successful solid state batteries from its raw chemical components and did impedance testing on 5 batteries.
- Experimented with different viscosity of electrodes and its' effects on battery conductivity using centrifuge.

PROJECTS

Autonomous Robot Product Engineering & Design *Aug 2021 – Present*

- Integrated wood machining tools, 3D printing, motors, and ultrasonic sensors to build autonomous robot for competition.
- Collaborated with 4 team members to CAD 50+ robot components in SolidWorks and performed validation through FMEA.
- Designed customer centric robot with measurable target engineering requirements using Quality Function Deployment tools.
- Mitigated multiple design risks with iterative testing and rapid prototyping in final design of product, reducing errors by 90%.

3D CAD Engineering Design & Visualization of Ocean Garbage Collection Machine *Oct 2020 – Dec 2020*

- Collaborated with 4 team members to ideate and model 60 components of the project using Solidworks.
- Modelled assembly and animations of our design to provide clearer visualization of our design specifics and operations.
- Evaluated and redesigned our idea using product design ideation methods to streamline final form and function of product.

Genre Classification of Music Using Machine Learning Analysis *Oct 2020 – Dec 2020*

- Project aims to classify mood and genre of song based on the characteristics of each song (dancability, energy, valence, tempo).
- Identified 2500 datasets to obtain consistent results, filtering out biased datasets and normalizing datasets to standardize analysis.
- Collaborated with 3 other team members to analyze data using unsupervised learning methods of machine learning algorithms (KMeans, GMM, DBScan, Hierarchical Clustering).

Interactive Product Design of Entertainment Console *Jan 2020 – May 2020*

- Utilized ARM Mbed MPC1768 with accelerometer and 3 push up buttons for gameplay controls.
- Designed adventure game with 2 quests, 10 sprite designs and 2 difficulty levels within 2 movable maps.
- Programmed with C++ in ARM mbed development environment using 6 files and 2000+ lines of code.

Preventative Avoidance of Injury Through Muscle Strain Measurement *Aug 2019 – Dec 2019*
IoT in Health, Vertically Integrated Project, Dr. Milad Navaei

- Initiated data analysis on 5000 points of muscle strain data using MATLAB with bandpass filtering of EMG waves.
- Implemented software code in C++ using Arduino and extracted time dependent data from EMG and heartrate sensors.
- Utilized rapid prototyping techniques with testing on microcontroller to send and receive data wirelessly through ESP32 board.
- Established product design of idea to detect muscle strain within 48 hours before heavy injuries occur through muscle tear.

Intelligent Home Assistant – Build GT 2019 *Oct 2019*

- Collaborated with group of 4 to create an intelligent home assistant with interactive features and LED displays within 36 hours.
- Worked with Adafruit ESP32 to obtain weather data from APIs and remotely controlled through WiFi module.
- Constructed up to 20 options of interactive, nonlinear choice based narration using Twine in HTML and CSS.
- Successfully created remote controlled LED project from personal phone using ESP32 through Arduino IDE.

Robotics Team – GT IEEE *Jan 2019 - Mar 2019*

- Setup and collected specific measurement data out of LIDAR, sonar sensors, Time of Flight sensors for robot.
- Implemented software code in C++ using Arduino for data extraction of specific coordinate data of obstacle detection.
- Integrated output of data for processing of coordinates and detecting obstacles for 5 different types of sensors.
- Conducted research on 20+ different sensors and controller boards to determine the optimal choice of hardware.

LEADERSHIP

Co-Founder – 180 Degrees Consulting @ Georgia Tech *Jul 2020 – Dec 2020*

- Collaborated with a team of 9 people to design constitution of consulting organization that aims to help non-profit organizations.
- Designed and created official website page to provide more information about our organization and gain attraction.
- Contributed to branch proposal pitch by designing a Gantt chart and suggestions for internal review in our organization.
- Acting as communications director to bridge the connection between students and organizations that would be interested.

SKILLS & INTERESTS

Software: SolidWorks | CATIA V5 | Autodesk Inventor | Arduino IDE | Tableau | Talend | Cadence | JIRA | Microsoft Office Suite | Inkscape | Job Control | Ultimaker Cura | VSDC Video Editor |
Methodology: Design for Manufacturability (DFM) | Design for Assembly (DFA) | Statistical Tolerance Analysis | Functional Geometric Dimensioning and Tolerancing (GD&T) | Finite Element Analysis (FEA) | Computer Aided Engineering (CAE)
Programming: MATLAB | Python | Java | Arduino C | C++ | LabVIEW | MIPS Assembly | HTML/CSS
Fabrication: Ultimaker 3 | Stratasys | Trak Mill | Lathe | Soldering | Bandsaw | Table Saw | Drill Press | Water Jet | Laser Cutter |
Instrumentation: NI-DAQ | Oscilloscope | Waveform Generator | Multimeter | Flowmeter | Thermocouple | Infrared Thermometer |