Zuyu Meng

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EDUCATION

Northeastern University

- **PhD in Electrical Engineering in the area of micro and nanoelectromechanical systems** 2023 Jun-Present

University of California, Berkeley Aug 2021-May 2022

- ***M.E. in Mechanical Engineering***
- ***Current GPA: 3.5 out of 4.0***

Linfield University Aug 2017-May 2021

- ***B.S. in Applied Physics***
- ***Current GPA:3.536 out of 4.0***

WORK EXPERIENCE

Kawasaki Robotic Company in Chongqing (Computer Vision) June 2021 - Aug 2021

Applied Computer Vision to classify the screw holes for Haier company

- Applied **vision master's** system to the 6-joint robotic arm with a vision-controlled screwdriver for screw installations
- Obtain a picture of the holes and filter the black spots and noise in the image. Using **Laplace edge detection operator** for edge detection and converting image to binary values.
- Applied **Hough transformation** to binary images and found the center point of the anchor with coordinate (X, Y) Matching the location of the screwdriver to the coordinate (X, Y), and set it to 15 pound-feet of torque

PROJECT

Pulse Detector for Traditional Chinese Analysis Fall 2021 – Spring 2022

Master Thesis */ Developed a real-time PID Controller using Arduino for cuff model*

- Constructed an **artificial arm** with vein and artery vessels to simulate the blood flow of the human body
- Applied **Arduino system** to collect data for blood pressure, blood flow rate, cuff pressure
- Put data in **Matlab** to visualize the relation between blood pressure and cuff pressure
- Fine-tune the parameters of **Kd, Kp, and Ki** in order to reduce noise and minimize the difference between the change in blood and cuff pressures

Extendable MEMS Structures Fabricated by Sandia Process Fall 2021 – Spring 2022

Master Research / *Designed a micro extendable structure for sensor applications*

- Extendable structure in which surface areas could be expanded by moving the two layers of polysilicon
- The Sandia process is adopted for the fabrication process, as more than two layers of polysilicon need to be deposited
- Four layers of polysilicon and three layers of oxide are deposited and patterned with overall 9 masks
- By moving the bottom plate, the whole structure will expand to generate more surface area
- This design could be applied to sensors requiring a huge contact surface area while maintaining a small size when not working.

Nano Magnetic Core Material for Transformers Jun 2019 – Aug 2019

Undergraduate Intern / *improved thermal efficiency by reducing the contact surface*

- Constructed transformer core cases with Solidworks and printed them with a 3D printer
- Applied three different nanoparticle materials for making the core and efficiency comparison
- Applied two different coating materials for nanoparticles, chlorine film, furniture clear coat
- Improved thermal efficiency by 30%

Conversion Rate Prediction for Marketplace (Python, Machine Learning, SQL) Sep 2021 – Nov 2021

- Performed data preprocessing on 310,000 transaction observations and conducted feature engineering including possible outliers' removal, one-hot encoding for categorical features
- Trained logistic regression and random forest models while handling imbalance between classes and achieved prediction performance AUC = 0.84 and AUC = 0.95, respectively
- Visualized feature importance, concluded the necessity of user segmentation to further improve the conversion rate, and proposed potential improvements.

SUMMARY OF SKILLS

- **Leadership:** Organizational Behavior, Communication as an engineering leader, Teaming & Project Management
- **Statistical Modeling:** General/Generalized Linear Model, Model Selection & Regularization (LASSO, Ridge, and Elastic net), Survival Analysis, Structure Equation Modeling, Time Series Analysis
- **Machine Learning:** Classification (Logistic Regression, Linear Discriminate Analysis, Decision Tree, Random Forest, K-Nearest-Neighbors, Gradient Boosting, Support Vector Machine, Neural Network**)**, Clustering, Dimensionality Reduction & Feature Discovery (Principal Component Analysis), Ensemble Models, Text Analysis
- **Deep Learning**: Tensorflow, PyTorch, transfer learning with TF hub, Fine tuning
- **Programming skills:** Python, MATLAB, SQL, Auto CAD, Solidworks, Arduino