# **EDUCATION**

**Doctorate of Philosophy**, Mechanical Engineering University of Minnesota

Masters of Science, Mechanical Engineering University of Minnesota

Bachelors of Science, Physics Austin Peay State University Minors: Mathematics, Chemistry

LANGUAGES & SOFTWARE

Languages: Javascript, CSS, HTML, Python, R, MATLAB, C/C++, SQL, Bash/Shell, PHP, Processing, Fortran Software: NodeJS, Tensorflow, Express, Git, AWS, MongoDB, Creo, ANSYS Workbench, IATFX

## PROFESSIONAL EXPERIENCE

#### Love My Delta, Inc.

Cofounder & Lead Software Engineer

- Member of initial founder group in surgical aesthetics analysis company, capable of quantifying cosmetic surgery outcomes
- Led software testing in creation of research studies and initial web platform including Node is and AWS EC2
- Created database capable of automatically obtaining multimodal media from customers capable of being implemented into automated feedback system

#### Medical Robotics and Devices Laboratory Graduate Research Assistant

- Specialized in using discriminative machine learning algorithms and statistics techniques
- Created a Bidirectional Long Short Term Memory network capable of classifying performer's surgical skill with 95% accuracy
- Collectively computed linear mixed effects and fixed effects models with ANOVA hypothesis testing to quantify statistical significance of various point-to-point hand movement prediction models
- Extracted spatio-temporal optical flow features from frame-by-frame video analysis
- Strong experience working with machine learning frameworks including Tensorflow and PyTorch

#### Robotic Surgery Readiness(RSR) Study

Research Scientist

University of Minnesota/University of Washington/Intuitive Surgical

- Performed metric analysis of multiple terabytes of kinematic and video data
- Created a de-identified database of 350+ robotic minimally invasive surgical cases
- Developed crowd-sourcing web platform used for obtaining hundreds of personalized assessments of technical skill, using Google Cloud instance on an Apache server
- Learned strong verbal and written communication skills while working with cross disciplinary teams

Minneapolis, MN

May 2020

May 2019 Minneapolis, MN

> Dec. 2016 Clarksville, TN

2017 - 2020

Minneapolis, MN

2017 - 2020 Minneapolis, MN

2020 - Present

# Graduate Teaching Assistant

University of Minnesota

- Led laboratory classes in learning course material for a mechanical measurements class
- Assisted in leading students towards learning the material during labs and graded course assignments
- Managed course website

# Undergraduate Researcher

Austin Peay State University, Physics Program

- Provided team with data storage structures, data mining, and data cleansing techniques
- Experimented using differential scanning calorimetry temperature patterns with varying proportions of bioglass and polyvinylpyrrolidone
- Built extruder capable of outputting 3-D printer friendly filament produced from 45S5 Bioglass<sup>®</sup>

# **College Physics Structured Learning Assistance Leader**

APSU Academic Support Center

- Led structured assistance workshops twice a week in which a class of approximately thirty college physics students would attend
- Reviewed conceptual questions as well as general physics problems in order to establish concepts and promote learning

## **CRLA Level 3 Certified Master Tutor**

APSU Academic Support Center

- Certified by the College Reading and Learning Association (CRLA). Tutored various undergraduate students in Pre-Calculus, Calculus, Physics, and other math and science-related fields
- Demonstrated proficiency in tutoring and accumulated more than 150 hours tutoring

## Visible Heart Lab

**Engineering Intern** University of Minnesota

- Developed methods to image heart tissue vasculature using computed tomography, magnetic resonance imaging, and visualized them with 3-D printed models.
- Demonstrated techniques to properly occlude tissue vasculature and employed data science techniques to evaluate the efficiency.

# PUBLICATIONS and ABSTRACTS

- Jason Kelly, Thomas S. Lendvay, et.al. "Robotic Surgery Readiness: A Randomized Controlled Study of Virtual Reality Warm-Up Prior to Robot-Assisted Surgery", Journal of the American College of Surgeons, In Preparation
- Jason Kelly, et. al. "Bidirectional Long Short Term Memory for Surgical Skill Classification of Temporally Segmented Tasks", International Journal for Computer Aided Radiology and Surgery, Submitted
- M. Diboro Kanabolo, ... Jason Kelly, et. al. "Measuring the Effects of Unconscious Bias on Objective Surgical Skills Assessment", in Proceedings of the American College of Surgeons Clinical Congress, Submitted, 2020.
- Jason Kelly, et. al. "Temporal Variability of Surgical Technical Skill Perception in Real Robotic Surgery", International Journal of Computer Assisted Radiology and Surgery, Aug 2020.
- Jason Kelly, Timothy M. Kowalewski, et.al. "The Effect of Video Playback Speed on Surgeon Technical Skill Perception", Information Processing in Computer-Assisted Interventions, Munich, Germany, June 2020.
- Justin Szezlack, Jason Kelly, et. al. "Role of Bi and Ga additives in the physical properties and structure of GeSe<sub>4</sub>-GeTe<sub>4</sub> glasses," Materials Characterization, vol. 142, pp. 50-59, Aug. 2018

Clarksville, TN

2015 - 2017

Clarksville, TN

2015 - 2016

Clarksville, TN

2015 Minneapolis, MN

2016

## CONFERENCES AND PRESENTATIONS

- Thomas S. Lendvay, ..., Jason Kelly, et. al. "Robotic Surgery Readiness: What is the Optimal Warm-up for Robotic Skills?", Societies for Pediatric Urology, Fall Congress, Sept. 2018.
- Jason Kelly, "Recurrent Neural Networks for Surgical Skill Evaluation", Medical Imaging with Artificial Intelligence (MIWAI), Minneapolis, MN, July 2019.
- Jason Kelly, et. al. "Magnetic Resonance Imaging for Modeling of Human Heart Vasculature", Southeastern Section American Physical Society Conference, University of Southern Alabama, Oct. 2015
- Computer Aided Radiology and Surgery June 2019 Rennes, France
  - Conjunction of CARS, Surgetica, IPCAI, ISCAS, CMI, and CAD international conferences
- Hamlyn Symposium on Medical Robotics June 2019 London, England
  - International conference focused on medical robotics
- LSSURP Research Symposium University of Minnesota, Minnesota Aug. 2015
  - Presented culmination of the results found from the research conducted over the past ten weeks

# PROFESSIONAL TRAINING

Complete Node.js Course - CodeWithMosh	April 2020
• Databases and SQL for Data Science - Coursera - IBM	July 2019
Deep Learning Specialization - Coursera - Stanford University	May 2019
Responsive Web Design Certification - FreeCodeCamp	Jan. 2019

## HONORS AND AWARDS

<ul> <li>James and Christy Wilson Physics Scholarship</li> <li>Awarded competitive scholarship based on academic merit among physics majors at Austin Peay State University</li> </ul>	Fall 2016
<ul> <li>Summer Undergraduate Research Fellowship</li> <li>Awarded competitive scholarship to conduct research on analyzing the bioactivity of mixtures of polyvinylpyrolidone (PVP) and 45S5 Bioglass<sup>®</sup></li> </ul>	Summer 2016
<ul> <li>High Impact Achievement Award</li> <li>Completed the Govs WorkPlus High-Impact student employment requirements</li> </ul>	Spring 2016
<ul> <li>Tennessee Space Grant</li> <li>Awarded as recognition for work on Chalcogenide glass research culminating in glass sent to space for analyzing</li> </ul>	2015 - 2016 amples being
<ul> <li>Darek Nicky Richardson Scholarship</li> <li>Awarded to a student majoring in Physics or Engineering with a minimum GPA of 3.2</li> </ul>	2015 - 2016
<ul> <li>Scholarship for Study of Math/Science Endowment</li> <li>Awarded to a student majoring in Math or a Science who shows financial need and exceed 3.2</li> </ul>	2015 - 2016 eds a GPA of
Sigma Pi Sigma Honors Society • Society of students majoring in Physics, having a GPA of 3.3 or greater in their Junior of	2015 - 2016 r Senior year
<ul> <li>Laurel Wreath Honors Society</li> <li>Society of students, regardless of major, who are distinguished members of the student members of the Austin Peay Honors Program</li> </ul>	2012 - 2016 body and are

Austin Peay Honors Program

• Program for highly motivated honors students requiring 30 'honors' credits during undergraduate studies