Alexander **Morain**

BIOENGINEERING STUDENT

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Education

University of Illinois at Urbana-Champaign *Champaign, IL*

B.S. IN BIOENGINEERING

MINOR, CHEMISTRY *Aug. 2017 - May. 2021*

- GPA 3.98/4.0

Experience

Jensen Deep Phenotyping Lab *Champaign, IL*

QUALITY ENGINEER *November 2019 – Present*

- Operating, calibrating, and maintaining liquid handling robots to perform 1,500 assays every week
- Monitoring complex workflows and schedules of multiple liquid handling robots
- Preparing and inventorying over 20 reagents to ensure smooth operation of liquid handling robots
- Performing and analyzing control assays to determine efficacy of experimental assays

Illinois Medical Advancements through Design and Engineering (i-MADE) *Champaign, IL*

CO-FOUNDER AND V.P. INTERNAL DEVELOPMENT *January 2019 – Present*

- Co-founded new student organization to bring students from all engineering disciplines together to develop engineering based solutions to current medical issues
- Coordinating and teaching technical workshops to provide members with a versatile set of technical skills to approach medical problems.
- Sourcing projects from companies and community members to identify medical issues that can be effectively solved with engineering principles
- Leading design project to program a Reddit tool to provide aid to first responders in the suicide watch mental health forum
- Overseeing design project to create a support brace for a dog with dual torn cranial cruciate ligaments in his back legs

Micro and Nanotechnology Laboratory *Champaign, IL*

UNDERGRADUATE RESEARCHER *January 2019 – Present*

- Developing a point-of-care microfluidic diagnostic system for febrile diagnostics
- Creating 3D printed clip-on housing for microfluidic chip to analyze spectrophotometrically using an iPhone camera
- Integrating a precise micro LED circuit into housing to analyze 1 mm ELISA-based testing lanes on a microfluidic chip
- Performing ELISA assays for precise measurement of antigens for febrile based diseases in a patient's blood
- Automated data analysis using Matlab to reduce time spent analyzing experiments by over 75%

Biomedical Engineering Society *Champaign, IL*

WORKSHOP COORDINATOR AND WEB DEVELOPER *August 2018 – Present*

- Coordinated technical workshops for 200+ members of BMES
- Shared expertise in technical skills such as programmable circuits, 3D modeling and printing, circuit design, and programming in python and Matlab
- Overseeing development of an online resource platform for bioengineering students to discuss coursework and career paths

MedIX REU – DePaul University | University of Chicago *Chicago, IL*

HEALTH INFORMATICS RESEARCH INTERN *June 2019 – August 2019*

- Applied natural language processing and association rule mining to Reddit forums for characterization of colloquial language surrounding drug abuse and mental health disorders
- Developed algorithms to scrape social media posts in Reddit related to mental health disorders and addiction
- Wrote algorithms for association rule mining across multiple subreddits to allow for convenient subreddit sentiment analysis for language archetype development
- Authored 3 papers utilizing social media analysis to aid in understanding of mental health disorders

Projects

Raynaud's Gloves – Targeted Heat Therapeutics *Champaign, IL*

PROJECT LEADER *Aug. 2019 – Present*

- Designing prototype gloves for targeted heat therapy for people suffering from Raynaud's syndrome
- Designing app to communicate with heated gloves to fully control temperature and region of heat therapy
- Managing team of four to oversee efficient development of prototype for presentation at the University of Illinois' Engineering Open House

Bioacousic Levitator

Champaign, IL

PROJECT LEADER

Aug. 2018 – Mar. 2019

- Created an ultrasonic levitation device to allow for noninvasive surgical techniques to be employed using ultrasonic levitation
- Constructed a circuit to synchronize an array of ultrasonic transducers
- Designed and printed a 3D casing to focus transducers, creating a pocket of microgravity conducive for levitation or ablation
- Finalist for Illinois Health Maker Lab $10,000 competition

Leadership

Conservation Principles of Bioengineering

Champaign, IL

COURSE ASSISTANT

August 2019 – Present

- Teaching concepts of modeling biological systems in bioengineering to over 80 students
- Offer office hours and attend classes weekly to improve student understanding of complex biological systems

Bioengineering Undergraduate Advisory Board

Champaign, IL

BOARD MEMBER

January 2019 – Present

- One of two selected from bioengineering cohort to channel feedback for departmental improvement
- Communicating constantly with department advisors and heads to promote departmental innovation and effective use of departmental resources

University of Illinois Department of Bioengineering

Champaign, IL

BIOENGINEERING AMBASSADOR

Mar. 2019 – Present

- Conduct tours of bioengineering facilities for prospective students and faculty
- Organize department events and activities to promote the department to prospective students

University of Illinois College of Engineering

Champaign, IL

ENGINEERING LEARNING ASSISTANT

Aug. 2019 – December 2019

- Serving as a teacher and mentor for the introductory engineering course for freshman in bioengineering
- Taught class of 30 students foundational tools for success in the field of engineering, from resume building to communication and networking
- Guided student project development to develop understanding and expertise in bioengineering disciplines such as computational biology, therapeutics engineering, and biomechanics

University of Illinois Division of Intercollegiate Athletics

Champaign, IL

ACADEMIC TUTOR

Aug. 2019 – May 2019

- Provide expertise in previous coursework to student athletes at the University of Illinois
- Tutored student athletes in various technical subjects, such as all levels of mathematics, general and organic chemistry, introductory computer science courses and upper level biology courses

Honors & Awards

2019	**Finalist**, Illinois Health Make-a-Thon $10,000 Entrepreneurial Competition	*Champaign, IL*
2019	**Chancellor's Scholar**, University of Illinois Campus Honnors Program	*Champaign, IL*
2019	**Dean's List**, University of Illinois at Urbana-Champaign	*Champaign, IL*
2019	**Best Final Design Project**, Bionstrumentation Lab	*Champaign, IL*

Skills

Programming Languages	Java, Python, Matlab
Natural Language Processing	Word2Vec, Topic Modeling, Gensim
Circuit Development	Programmable Circuit Boards, Bioinstrumentation Circuitry, Eagle Circuit Board Design
Cell Manipulation	Cell Culturing, Cell Staining, Cell Viability
Laboratory Quantification Tests	Gel Electrophoresis, Protein Quantification, Western Blot, ELISA

Publications

- Kathleen Isenegger, Alexander Morain, Elise Glaser, Yilan dong, Jonathan Gemmell. "Comparing Automatically Extracted Topics from Online Mental Health Disorder Forums". 6th Annual Conf. on Computational Science & Computational Intelligence (CSCI'19), Las Vegas, Nevada, Dec 05-07, 2019
- Alexander Morain, Elise Glaser, Jonathan Gemmell, Daniela Raicu. "Comparing Automatically Extracted Topics from Online Suicidal Ideation and the Responses they Invoke". 35th ACM/SIGAPP Symposium On Applied Computing (SAC'20), Brno, Czech Republic, Mar 30-Apr 03, 2020