James O'Flanagan

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Summary

Experienced Mechanical and Computational Engineer with a deep background in biotechnology, simulation, and generative AI, who is looking for the Lead AI Engineer position. Pioneered innovative projects at the intersection of mechanical engineering and biotech, including the development of Edi Oapsie, an advanced generative AI for engineering applications. Holds multiple patents and has led significant projects in biotech and computational modeling.

Biotechnology Experience

Chief Engineer & Founder, OAPSIE Inc.

Mar 2019 – Present

- Developed Edi Oapsie, an engineering project leveraging Generative AI to explore its application in mechanical engineering, showcasing potential in automating design processes, enhancing innovation, and problem-solving within biotech and engineering fields.
- Spearheaded the Pennantview project, an innovative platform using computational methodologies to model human biophysical movements, with implications for biotech and sports science.

Lead Design Engineer, Ophthalmic/Biotech Startup

Jan 2020 – Dec 2022

- Led software and hardware system design, incorporating AI to enhance ophthalmic diagnostic and treatment solutions.
- My work resulted in several patents, underscoring innovations in biotech and ophthalmic treatment technologies.

Senior Engineer, Rubber Simulation Projects

Goodyear 2001-2012, Hankook 2016-2019

- Conducted Finite Element Analysis (FEA) modeling of rubber tires, including composite physics, engineering mechanics, and visco-elasticity.
- All are used in human tissue HPC modeling & simulations.

Education

The University of Akron, Akron, OH. *2007 – 2010.*

Master of Science in Engineering Management. Specialization: Finite Element Analysis and Computational Mechanics, & International Business. GPA: 3.85

- Thesis: "Outsourcing FEA jobs at Large US Manufacturing Companies: Sound or Unsound?"
- Developed a computational model simulating the biomechanical properties of synthetic rubbers, drawing parallels to human tissue mechanics in biotechnological applications.

Case Western Reserve University, Cleveland, OH. *2000 – 2002.*

Bachelor of Science in Computer Engineering. GPA: 2.9

- Coursework included Advanced Programming, Machine Learning, Artificial Intelligence, and Bioinformatics, providing a solid foundation in the computational skills required for biotech and AI research and development.
- Capstone Project: "Design and Simulation of a Generative AI Model for Optimizing Biomechanical Devices," exploring the early use of AI to innovate in the biotech space.

John Carroll University, University Heights, OH. *1998 – 2000.*

Major: Applied Physics. GPA: 3.86

- Emphasis on Engineering Physics and Applied Physics, offering a strong analytical and problem-solving skill set applicable to challenges in biotechnology and material science.
- Engaged in research projects focused on the application of physical principles to biological systems, laying the groundwork for a career at the intersection of technology and life sciences.

Professional Memberships & Conferences

- Memberships:
    - **American Society of Mechanical Engineers (ASME)**: Expertise in developing and applying AI algorithms for predictive modeling, data analysis, and automation in biotech applications.
    - **Sigma Pi Sigma Physics National Honor Society**: Member since May 1999, recognizing outstanding achievement in physics.

- o **The Order of The Engineer**: Inducted in March 2023 for the highest standards of engineering ethics & practice.
  - o **Society for American Baseball Research (SABR)**: At intersection of sports science & mechanical engineering.
  - o **NEO Science Fair Judge**: Served as a judge for the 70th Annual NEO Science and Engineering Fair at Cleveland State University in March 2023.
  - o **Golden Key International Honor Society**: Inducted in Nov. 2008 for academic excellence & leadership potential
- Conferences:
  - o **SABR 51**, **ASME IMECE**, **ASCRS** 2021, **AAO** 2021, **ASCRS** 2022, **AAO** 2022, **Tire Society** 2016, **Tire Society** 2017 – Contributions and presentations highlighting the intersection of AI, mechanical engineering, and biotech.

Skills

- **Artificial Intelligence (AI)**: Expertise in developing and applying AI algorithms for predictive modeling, data analysis, and automation in biotech applications.
- **Machine Learning**: Proficiency in machine learning techniques for analyzing biological data, enhancing diagnostic tools, and optimizing biotechnological processes.
- **Finite Element Analysis (FEA)**: Advanced skills in FEA for simulating the mechanical properties of biological tissues and developing medical devices.
- **Biomechanics**: Knowledge of the mechanical aspects of biological systems, crucial for designing biomechanical devices and understanding tissue-material interactions.
- **Computational Modeling**: Experience in creating computational models for simulating complex biological processes and material behaviors.
- **Biotechnology:** Broad understanding of biotechnological principles and techniques, including genetic engineering, cell culture, and bioinformatics.
- **Patent Development**: Demonstrated ability in inventing and patenting innovative solutions in biotech, AI, and mechanical engineering.
- **Generative Design**: Application of generative design principles in engineering to create optimized structures and devices for biotech applications.
- **Data Analysis & Predictive Analytics**: Proficiency in statistical analysis and predictive modeling to derive insights from large biological datasets.
- **Robotics and Automation**: Knowledge of robotics and automation technologies for enhancing efficiency and precision in biotechnological manufacturing and research.
- **Technical Computing:** Advanced proficiency in Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD), and Fluid-Solid Interaction simulation. Concepts in modeling tires facilitate breakthroughs in medical device design.

Patents

This section underscores the innovative application of biotechnological concepts in surgical assistance, computational modeling, and the broader medical field, reflecting a deep commitment to advancing healthcare and biotechnological research.

- **VIRTUAL INTEGRATED REMOTE ASSISTANT APPARATUS AND METHODS**
  - o *Patent Application #20230067625, Filed August 24, 2022*
  - o Co-invented a system integrating virtual assistance with real-time feedback mechanisms for surgical procedures, showcasing innovative use of biotechnology in improving patient care and surgical outcomes.
- **SYSTEMS AND METHODS FOR OCULAR FINITE ELEMENT MODELING AND MACHINE LEARNING**
  - o *Patent Application #20230351073, Filed November 2, 2023*
  - o Developed a novel finite element modeling system combined with machine learning to simulate ocular responses, advancing the field of computational biology and offering new pathways for personalized medical treatments.
- **OCULAR SIMULATED CAMERA ASSISTED ROBOT FOR LIVE, VIRTUAL OR REMOTE EYE SURGERY TRAINING APPARATUS AND METHOD**
  - o *Patent Application #20230142530, Filed May 11, 2023*
  - o Engineered a robotic system for surgical training, utilizing simulated ocular movements to create a virtual training environment, highlighting the fusion of robotics, biotechnology, and medical training tools.

- **COMPUTATIONAL METHODOLOGY FOR DETERMINING BASEBALL BIOPHYSICAL QUANTITIES**
  - o *US Patent No. 20230351073*
  - o Pioneered a computational approach to analyzing biophysical movements in sports, demonstrating the application of biotechnological principles in sports science and injury prevention.