MICHAEL CLANCY

Engineering, Art, Computer Science

Portfolio: michael-clancy.com

About

Education

M.S.E. Biomedical Engineering | Rowan University
Summa Cum Laude GPA 3.9
B.S.E. Bioengineering | University of Pittsburgh
Cum Laude GPA 3.4

Relevant Courses

Signals and Systems, App. of Signal Processing, Data Structures, Adv. Mechatronics, Adv. Robotics

Probability and Statistics, Operations Research, Applications of Analysis

Biochemistry, Organic Chemistry, Genetics, Microbiology, Physiology, Immunology, Nanoparticles

Reading Material

Optimal Control Theory | Donald E. Kirk

Certifications

Outdoor Emergency Care (OEC) for the National Ski Patrol

Basic Life Support (BLS) for Health Care Providers

Skills

Programming Languages:	Experience:
C++	Industry, Graduate Research
MATLAB	Industry, Undergraduate and Graduate Research, Coursework
Python	Industry, Independent projects, Coursework
Programs:	**Experience:**
SolidWorks	Graduate Research and Coursework
Arduino	Coursework

Awards

NSF I-Corps National Program Invitee and Completer ($50,000 in funding)

Rowan University Project NEST Grand Prize Winner ($500 in funding)

Undergraduate Research Fellowship Award ($4,000 in funding)

Publications

M. Clancy, F. Alruwaili, M. Saeedi-Hosseiny, S. McMillian, I. Iordachita, M. Abedin-Nasab (2023) *Analysis and Optimization of a 6-DoF 3-RRPS Parallel Mechanism for Robot-Assisted Long-Bone Fracture Surgery,* ASME JMR

F. Alruwaili, **M. Clancy**, M. Saeedi-Hosseiny, J. Logar, C. Papachristou, J. Parvizi, I. Iordachita, M. Abedin-Nasab
*Design and Experimental Evaluation of a Haptic Robot-Assisted System for Femur Fracture Surgery, (*manuscript submitted for publication*)*

M. Saeedi-Hosseiny, F. Alruwaili, **M. Clancy**, E. Corson, S. McMillian, C. Papachristou, N. Bouaynaya, M. Abedin-Nasab (2022)
Automatic Alignment of Fractured Femur: Integration of Robot and Optical Tracking System, IEEE Robotics and Automation Letters

F. Alruwaili, M. Saeedi-Hosseiny, **M. Clancy**, S. McMillan, I. Iordachita, M. Abedin-Nasab (2022) *Experimental Evaluation of a 3-Armed 6-DOF Parallel Robot for Femur Fracture Surgery,* JMRR.

M. Clancy, S. Sekhar, A. Batista, P. Loughlin. (2020). *Extensions and Analysis of a Virtual Balancing Task for Studying Sensory-Motor Control.* Ingenium.

S. Canton, S. Dadi, A. Anthony, R. Black, **M. Clancy**, J. Fowler (2020). *Comparison of Screw Quantity and Placement of Metacarpal Fracture Fixation: A Biomechanical Study.* HAND.

Presentations

Robotic Parallel Mechanisms for robot assisted femur repair surgery, 2022 NJECC

Optimization of a 6-DoF 3-RRPS parallel mechanism for robot assisted surgery, 2022 LSF

Exploring Sensory-Motor Control Through Virtual Object Manipulation, 2019 BMES

Patents

Universal Adaptor for Intravenous Pole Attachments, Patent Application Number: 63020185

Industry Experience

Lockheed Martin Systems Engineer II
Agile, Git, JIRA, C++, MATLAB, Python, R&D, AI&ML, Nonlinear Control Systems

Argo A.I. Data Engineer I
Agile, Python, AI&ML, Argo A.I. Self-Driving System (SDS)

National Ski Patroller Boyce Park, PA
Provided first aid to injured skiers, assisted in teaching new patrollers

Research Experience

Graduate Research Assistant
Dr. Mohammad Abedin-Nasab: Surgical Robotics Laboratory
Theoretical analysis and design of parallel mechanisms for surgical procedures
Keywords: Parallel Mechanisms, Inverse Kinematics & Dynamics, Optimization, Global Conditioning Index (GCI), Genetic Algorithms, Open & Closed Loop Sol.

Undergraduate Research Assistant
Dr. Patrick Loughlin: Sensory Motor Integration Laboratory and Engineering
Constructed somatosensory feedback systems using machine learning
Keywords: Machine Learning, Deep Learning, Neural Networks, Simulation

Dr. John Fowler, Dr. Stephen Canton: Orthopaedic Robotics Laboratory
Designed and performed testing to observe the efficacy of surgical techniques
Keywords: Biomechanics, Cyclic loading, Improving surgical techniques

Teaching Experience

Biocompatibility and Immunoengineering Graduate Teaching Assistant (TA)
Assist with teaching lectures, Facilitate student learning and engagement

Mechanical Foundations of Engineering Graduate TA
Create assignments and provide feedback, Facilitate student learning and engagement

General Chemistry I, II, and Bioinstrumentation Undergraduate TA
Proctor recitation and laboratory classes, Create and provide feedback on assignments

Independent Projects

Chess Engine: Python, heuristic minimax algorithm, Alpha-Beta pruning, Zobrist Hashing
https://www.michael-clancy.com/chess-ai
Keywords: Minimax, Alpha-Beta Pruning, Recursion, Dynamic Programming

Computer Generated Art: Python, art from white noise
michael-clancy.com/domain-warped-fbm
Keywords: Fractal Brownian Motion, Perlin Noise, Domain Warping, Artistic Renditions

Coursework Projects

Autonomous Car: Arduino, object avoidance and trajectory algorithm using sonar array
https://www.michael-clancy.com/autonomous-car
Keywords: Computer Vision, Path planning, Integration

Handheld 2D printer: LabVIEW, B&W printer, image dithering algorithm for image processing
Keywords: Image Processing, Integration, diffuse image dithering

Match Filter Voice Classification: MATLAB, distinguish voices with >90% accuracy
Keywords: Match Filtering, Signal Processing, Audio Classification, Voice Recognition

Two Hands: raw charcoal, black background, sketching portfolio
michael-clancy.com/charcoal-sketching

Automatic Tractography Segmentation Algorithm: MATLAB and R, auto segmentation of brain connections to classify neurological disorders
Keywords: High-Definition Fiber Tracking (HDFT), MRI, autonomous segmentation