

PMAE Presented Thesis

Department	Mentor/Advisor (s)	Thesis Title
Anesthesiology	Micha Sam Brickman Raredon, MD, PhD	Testing the Effect of Dynamic Ventilation on BASC Differentiation in Bioengineered Whole Lung Tissues
		Defining the Temporal Relationship Between Inflammation and Krt17+ Transitional Epithelial Cells in Post-Pneumectomy Lung Regeneration Rat Model
Biomedical Engineering	W. Mark Saltzman, PhD	Bioorthogonal Catalysis Nanoparticles for Brain Tumor Therapy
Biomedical Engineering Radiology & Biomedical Imaging Electrical & Computer Engineering	Lawrence Staib, PhD James Duncan, PhD	ClassGen-MRI: A 3D Dataset with Classification Labels for Radiology Report Generation
Biomedical Informatics & Data Science Radiology & Biomedical Imaging	Xenios Papademetris, PhD.	Developing an AI Chatbot for Parenting Mindfully for Health Intervention Data
Cardiovascular Medicine	John Stendahl, MD, PhD	Pre-transplant Therapeutic Delivery of Calcium Phosphate Nanoparticles During Ex-Vivo Normothermic Machine Perfusion
		Assessing Myocardial Blood Flow during Ex-Vivo Normothermic Perfusion
		Application of Echocardiography and Therapeutic Delivery During Ex Vivo Normothermic Perfusion Prior to Heart Transplantation
		Development of Techniques for Therapeutic Delivery to Protect and/or Rehabilitate Hearts Prior to Transplantation: Nanoparticle Delivery to the Heart During ex vivo Perfusion
Cellular & Molecular Physiology	Mark Schneeberger-Pané, PhD	Understanding the neurobiology of social balance and sex-dependent differences
Dermatology	William Damsky, MD, MPH Jeffrey Cohen, MD, MPH	Profiling cytokine patterns in psoriasis and atopic dermatitis: A comparative approach using RNA and proteomic data from skin samples
	Andrew Johnston, MD, PhD	Spatially Dissecting Pyoderma Gangrenosum Pathogenesis and Discovering Biomarkers of Sterile Inflammation
Ecology & Evolutionary Biology	Paul Turner, PhD	Personalized Bacteriophage Therapy Targeting Pseudomonas aeruginosa Virulence
Immunobiology Biomedical Engineering	Jordan Pober, MD, PhD Mark Saltzman, PhD	Characterization and 3D culture of Lymphatic endothelial cells

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Industry Orthopaedics & Rehabilitation	Medivis Alyssa Glennon	Assessing the accuracy of 3D assistive technologies for surgical guidance of bone tumor resections: A comparative study of mixed reality, patient-specific instruments and freehand approaches
Industry Orthopaedics & Rehabilitation	Materialise Alyssa Glennon	A lung segmentation tool for surgical planning of sublobar pulmonary resections
		Deep Learning-Based Automated Segmentation of the Radial Head from CT Images
Industry Orthopaedics & Rehabilitation	Zimmer Biomet Daniel Wiznia, MD	Comparing Bone Density from CT scans and X-Rays for Total Knee Arthroplasty
Industry Therapeutic Radiology	Materialise Christopher Tien, PhD	3D printed ring-and-tandem brachytherapy applicators for patient-specific cervical cancer radiotherapy
Industry Orthopaedics and Rehabilitation	Stryker Steven Tommasini, PhD	3D Printed Bone Material Analysis for Analog Testing and Implants
Interventional Radiology	Joshua Cornman-Homonoff, MD	Volumetric Analysis of Pulmonary Embolism Clot Burden in Relation to Pulmonary Arteries
Radiology & Biomedical Imaging Medical Physics	Matthew Hoerner, PhD	Projection Rendering of 3D Tomographic Images for 2D Clinical Presentation
Neurology	Jennifer Ahjin Kim, MD, PhD	Testing and Optimizing a Natural Language Processing Model to Identify Post-Traumatic Epilepsy Based on Patient Electronic Health Records
	Hitten Zaveri, PhD Dennis Spencer, MD	Biosensor-Integrated Cerebral Microdialysis Probe: A New Device for Continuous Online Microdialysis of Brain Metabolites
		NeuroProbe: Advancements in intracranial physiological monitoring for traumatic brain injury
		Brain Atlas: Developing a BCI to map the cortico-cortical evoked potential during epilepsy
		NeuroProbe: Evaluating Clark-Type Oxygen Electrode Biosensors In Vivo for Brain Tissue Oxygen Saturation Measurement
		A novel silicon-nanowire biosensor for the real-time detection of neurotransmitters
	Hitten Zaveri, PhD	Characterization and Optimization of Brain Implantable Oxygen Sensors for Neuromonitoring Applications

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Orthopaedics & Rehabilitation (Foot & Ankle)	Irvin Oh, MD	Accuracy and Stability of a Novel Patient-Specific 3D-Printed Guide in Minimally Invasive Medial Calcaneal Osteotomy: A Controlled Cadaver Study
Orthopaedics & Rehabilitation (Joint Reconstruction)	Daniel Wiznia, MD Steven Tommasini, PhD	Detection of Avascular Necrosis in the Femoral Head from Intraoperative CT: A Deep Learning and Python Script-Based Approach
Orthopaedics & Rehabilitation (Pediatrics)	David Frumberg, MD, FAAOS	Mechanical effects of different fulcrums on balanced cable bone segment transport
		Characterization of neuromuscular patellofemoral dysplasia
		Assessing the Influence of Corticotomy on Tibial Fracture Risk During Transverse Tibial Transport for Diabetic Foot Ulcer Patients
		Designing a 3D-Printed Surgical Guide for Percutaneous Lower Limb Closing Wedge Osteotomies
Orthopaedics & Rehabilitation (Sports Medicine)	John Fulkerson, MD	The effect of tibiofemoral rotation on popliteus stretch: An image analysis study
	Jim Hsu, MD	Evaluating the Efficacy of 3D Printed Surgical Guides in Tibial Tubercle Osteotomies
Orthopaedics & Rehabilitation (Upper Extremity)	Lisa Lattanza, MD, FAOA, FAAOS	The Effect of Insertion Angle and Bone Quality on the Fixation Security of Knotless Suture Anchors
		A Finite Element Analysis Study on Contact Variation of Radial Head Implant Stems due to Patient Variance
		Contact Variation of Radial Head Implant Stems Due to Intramedullary Canal Variance: A Finite Element Analysis Study
Orthopaedics & Rehabilitation Anesthesiology	Daniel Wiznia, MD Jinlei Li, MD, PhD	An Examination of Traditional Fixation Techniques for Dorsal Scaphoid Fractures
Orthopaedics & Rehabilitation	Lisa Lattanza, MD, FAOA, FAAOS Alyssa Glennon	Improving Medication Safety in Pump Programming: A Simulation Study
	Steven Tommasini, PhD Alyssa Glennon	A Patient-Specific 3D Printed Surgical Guide for Dorsal Scaphoid Fracture Fixation
		Defining quality inspection in point-of-care 3D printing of surgical guides
		Biomechanical Evaluation of 3D-Printed Customized PEEK Wedge-Plate Constructs for Distal Radius Corrective Osteotomies

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	Alyssa Glennon	Redefining Upper-Limb Prosthetics: Exploring Usability and Independence
Pathology	Themis Kyriakides, PhD	Towards re-epithelization in a human skin equivalent wound model with implications for diabetic foot ulcers
	Samuel Kartz, MD, PhD	B-II Spectrin Regulation of Actin Remodeling and Immune Synapse Stability in T cells
Pathology	Haris Mirza, MD, PhD	Investigating the pathophysiology of proximal colon cancer syndrome through a 3D organoid system
		Single Cell Proteomics (IMC): Identifying protein-based Biomarkers for Colorectal Cancer
		Early detection of colorectal cancers using spatial transcriptomics
Pediatrics (Critical Care)	Oliver Karam, MD, PhD	Non-invasive assessment of blood in chest tube output using near-infrared
Pediatrics (Hematology/Oncology)	Garrett Ash, PhD Asher Marks	Virtual Reality (VR) Game Design for Children with Type 1 Diabetes (T1D)
Psychology	Frank Buono, PhD	MRI-based 3D volumetric analysis of neurofibromatosis type 2 vestibular schwannomas
		Implementation of Artificial Intelligence Evaluation of Acoustic Neuroma Tumors - A Pilot Study
Surgery (Gastrointestinal)	John Geibel, DSc, MD	Application of a 3D bioprinter: Jet technology for “biopatch” development using cells on hydrogel supports
Surgery (Otolaryngology)	Yan Lee, MD	Development of an Endoscopic Precision Measurement Tool
Surgery (Plastic) Computer Science	Bohdan Pomahac, MD Alex Wong, PhD	Quantifiably compare the use of microsurgery robots to conventional (manual) surgery in breast reconstruction
Surgery (Plastic) Orthopaedics and Rehabilitation (Upper Extremity)	Elspeth Hill, MD PhD Lisa Lattanza, MD, FAOA, FAAOS	Three-Dimensional Characterization of Carpal Morphology in Spastic Wrist Flexion Contractures
Surgery (Vascular)	Edouard Aboian, MD	3D Modeling from Ultrasound of Arteriovenous Fistulas Used for Hemodialysis
	Britt Tonnessen, MD	Defining Duplex Ultrasound Criteria for Normal and Stenotic Anastomoses in Arteriovenous Dialysis Fistulas
Surgery (Transplant)	Joohyun Kim, MD, PhD	Developing a System for Hepatic Extracorporeal Xeno-Assist during Critical Liver Failure

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Surgery (Vascular) Therapeutic Radiology	Edouard Aboian, MD Sanjay Aneja, MD	Artificial Intelligence-Based Morpho-Volumetric Analysis of Iliac Arteries in Patients with Abdominal Aortic Aneurysm (AAA)
Therapeutic Radiology	Christopher Tien, PhD	Design optimization and validation of a custom SCVC brachytherapy applicator for dose reshaping in gynecological cancer radiotherapy
Therapeutic Radiology	Sanjay Aneja, MD	Applying machine learning to predict heart age
		Deriving Imaging Biomarkers for Primary Central Nervous System Lymphoma Using Deep Learning
		Utilization of Deep Learning on Lung PET Segmentations to Predict NSCLC Prognosis
		Few-Shot Transfer Learning Success and Feature Generalization in Deep Vision Networks for Mammography
		Analyzing Body Composition Changes in Breast Cancer Patients Undergoing Antibody-Drug Conjugate Therapy
		Imaging Biomarkers of Indolent Breast Cancer Using Deep Learning Models
		Comparing Tissue-based Genomic Risk Scores and Imaging Biomarkers for Prostate Cancer Outcomes