

DAVID WILLIAM BROTMAN

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EDUCATION:

- **Duke University**, Durham NC (December, 2016)
MS: Medical Physics (Nuclear Medicine Concentration)
- **Fairfield University**, Fairfield CT (May, 2011)
BS: Physics (Minor: Mathematics)

DEVELOPMENT OF STROKE MODEL TO IMPROVE PATIENT OUTCOMES

- **University of Connecticut (UConn) Health Center, Department of Radiology (October 2016 – June 2017)**
 - Research Topic: Use of Brain Perfusion Phantom for Stroke Thrombectomy Training in Interventional Cardiology
Mentors: Clifford Yang MD; Associate Professor of Radiology; Charan Singh MD; Assistant Professor of Radiology.
 - **Improved Patient Outcome:** Novel 3-D printed inexpensive accurate replica of neurovascular anatomy to provide hands-on thrombectomy-simulation experience to interventionists (interventional radiologists, neurosurgeons, and neuro-radiologists) to improve comfortability, decrease variability, increase patient safety, and decrease overall procedure time, which are all critical to patient outcomes in stroke care.
 - Media Coverage of Stroke Model
 - [YouTube](#) (Video of Stroke Model)
 - [U.S. News & World Report](#)
 - [CBS News](#)
 - [University of Connecticut \(UConn Today\)](#)
 - [AuntMinne.com \(Radiology & Medical Imaging News\)](#)
 - [EurekAlert \(American Association for the Advancement of Science; AAAS\)](#)

CLINICALLY RELATED RESEARCH EXPERIENCE

US Government Grant

- **Fulbright Scholarship, Center for Biomedical Imaging (CIBM), Lausanne, Switzerland (September 2011 – June 2012)**
 - Research Topic: A Novel Method for MRI Carotid Atherosclerotic Plaque Imaging
Mentor: Matthias Stuber PhD; Director, CIBM - University Hospital Center; Lausanne, Switzerland
 - **Improved Patient Outcome:** Allows for higher resolution images in arterial structures and importantly, increases volumetric coverage 3-fold.
 - Project Description: Combined use of PS-DIR (developed by CIBM Director, Matthias Stuber, PhD) and GRE to employ a unique pulse sequence to discriminate between the coronary lumen and vessel walls.

Cardiovascular Related Research

- **Yale University School of Medicine, MR Research Center (Summer 2009 – September 2011)¹**
 - Research Topic: Novel Cardiac Magnetic Resonance (MR) Imaging and Post-Processing Methods;
Mentor/Advisor: Smita Sampath, PhD, Assistant Professor of Diagnostic Radiology, Yale University
 - **Improved Patient Outcome:** This new technique provides better quantification of torsion and rotation of the left ventricle, allowing for a more accurate assessment of normal cardiac function.
 - Project Description: Diagnostic cardiac MRI as a way to quantify rotation and global torsion is a focus of interest in determining normal cardiac function, yet an overestimation of these parameters is typical due to the pressure gradients within the heart. The use Harmonic Phase Imaging (HARP) and Slice Following HARP, demonstrates this effect and addresses the overestimation on regional left ventricular twist.

¹ Yale MRI Research performed approximately 1-2 days/week on-site at Yale while attending Fairfield University as a full-time student.

Oncology Related Research

- **Yale Comprehensive Cancer Center – Clinical Trial Operations in Breast Medical Oncology (June 2017 – Present)**
 - Position: Clinical Assistant
Supervisor: Trisha Burrello MS; Lead Clinical Research Coordinator
 - **Improved Patient Outcome:** Screen and evaluate breast oncology patients undergoing clinical trial treatments at Yale impacting increased survival and improvement of quality of life.
 - Position Description: Recruitment, screening, and interviewing of patients for breast medical oncology clinical trials for therapeutic treatment. Assists in research design, writing and editing of protocols, publications, and data analysis for evaluation /compliance with physicians and pharmaceutical companies.
- **Duke University Graduate School, Department of Medical Physics (May 2013 – October 2016)**
 - Research Topic: PET Lesion Quantitation; Noise Estimates From Sub Scan Images
Mentor: Timothy Turkington PhD; Associate Professor of Radiology and Biomedical Engineering
 - **Improved Patient Outcome:** Allows nuclear medicine physicians to be able to confidently make accurate knowledgeable decisions about patient prognosis, diagnosis, and treatment.
 - Project Description: By analyzing the Poisson statistical nature of simulation, phantom, and clinical data (prostate cancer patients), scanner associated variability in nuclear medicine imaging can be determined.

Other Research

- **CERN, Geneva, Switzerland (July 2010) / Fairfield Univ., Physics Department (Spring 2010 – Summer 2010)**
 - Research Topic: Modify/Refine Photomultiplier Tubes (PMTs) Used in Hadron Calorimeter.
Mentor/Advisor: David Winn, PhD, Chairman, Physics Dept., Fairfield Univ.
 - Project Description: Development of shielded Photomultiplier tubes (PMTs) in order to enhance the lifetime of the PMTs used in the Large Hadron Collider (LHC) at CERN.
- **Johns Hopkins, Dept. of Biomedical Engineering: (Summer 2008)**
 - Topic: Maternal-Fetal Birthing Simulator Device; Mentor/Advisor: Robert Allen, PhD
 - Project Description: Designed & built a device in order to hold the fetal head freely in the birthing device simulator so that torsion forces on the fetal head could be more accurately detected and measured during simulated delivery.
- **Duke Univ. Field Astrobiology/Physics Program: Pisgah Astronomical Research Institute: (Summer 2006)**
 - Research Topic: Dark Matter (*See Publication, below*); Mentor/Advisor: Michael W. Castelaz, PhD
 - Project Description: Operation of optical and radio telescopes, collection of data, data reduction & analysis, calculation of radial velocities, and plotting Keplerian Rotation Curves.

MEDICAL-RELATED INTERNSHIPS

- ❖ **University of Maryland Pathology Intern: October 2014 - January 2015**
 - **Improved Patient Outcome:** Proposed novel techniques for developing improved methods of imaging diagnosis and treatment verification.
 - Project Description: Developed and received approval for a hybrid course bridging research aims of Medical Physics with that Nuclear Medicine and Pathology.

MEDICAL-VOLUNTEER EXPERIENCE

- ❖ **Duke Heart Center Community Outreach (May 2015 – June 2016)**
 - Instructor of compression-only CPR and automated external defibrillator (AED) training to private corporations, Duke Hospital, and the surrounding communities in order to raise the responder rates these areas and improve survival rates in relation to cardiac arrest incidents. Provided education/services/resources for the community to raise awareness for cardiovascular health and related diseases, such as diabetes.
 - Led efforts to secure funding for the Duke Heart Center Community Outreach program in the form of grants to hold conferences for community enrichment and improve resources (AED placement) for Durham County.

COMPUTER SKILLS/PROGRAMMING

- ❖ **Matlab**
 - MRI and PET/CT reconstruction and post processing
 - Developed and implemented a cardiovascular graphic user interface for Center of Biological Imaging, Switzerland.
- ❖ **Bash / C / C++**
 - Implementation of automated scripts for self-updating student publications (Hackathon)
 - PET/CT, MRI image reconstruction and post processing
 - MRI pulse sequence programming on Siemens IDEA development environment.
- ❖ **SolidWorks / 3D Printing**
 - Segmentation and 3D printing of arteries / vasculature of interest for training device; UConn Health
 - Development of hollow spheres / accessory parts for 3D printing for phantoms; Duke University.
 - Reproduction of fetal models and parts for birthing simulator; Johns Hopkins University BME Research.
 - Development of Photomultiplier Tube Components, which were used in LHC at CERN, Switzerland.
- ❖ **EPIC**
 - Proficiency and utilization for scheduling, writing patient notes, data entry, and statistics pertinent to clinical trials.

HONORS/AWARDS/GRANTS

- **First Place Poster Award** at 24th Annual Int'l Conference of Magnetic Resonance Angiography; Utrecht, Netherlands; 2012
- **U.S. Government Grant: Fulbright Scholarship:** Switzerland; 2011-2012 (see above)
- **Sigma Xi Grant-In Aid of Research** (Monetary Award to support Yale MRI Cardiac Research Project): 2010
- **Sigma Xi (International Honor Society of Research Scientists and Engineers):** Member 2010
- **Pi Mu Epsilon (The National Mathematics Honor Society):** Member 2011
- **Sigma Pi Sigma (The National Physics Honor Society):** Member 2010
- **Alpha Mu Gamma – (National Foreign Language Honor Society):** Member 2008
- **National Society of Collegiate Scholars:** 2009
- **Dean's List** (Fairfield University): 2007, 2008, 2010

PUBLICATIONS / PRESENTATIONS

- J.Debevitts, **D. Brotman**. Printing the New Frontier: A Blueprint for the Establishment of a 3D Printing Service at an Academic Institution with a Focus on Musculoskeletal Applications. Radiological Society of North America (RSNA) 2017 Annual Meeting: November 26 – December 2; Chicago, Illinois. (pending)
- T. Turkington, **D. Brotman**, J. Shaw, R. Davis. *Spatial Variability in a very High Sensitive PET System*. Society of Nuclear Medicine and Molecular Imaging (SNMMI) 2016 Annual Meeting: June 11-15, 2016; San Diego, California.
- G. Bonanno, **D. Brotman**, M. Stuber. *Phase-Sensitive Dual-Inversion Recovery for Accelerated Carotid Vessel Wall Imaging*. Invest Radiol. 2015 Mar;50(3):135-43.
- G. Bonanno, **D. Brotman**, M. Stuber. *Phase Sensitive Dual Inversion Recovery for Accelerated Carotid Vessel Wall Imaging*. 21st Annual Meeting & Exhibition of the International Society of Magnetic Resonance in Medicine (ISMRM): April 20-26, 2013; Salt Lake City, Utah.
- G. Bonanno, **D. Brotman**, M. Stuber. *Intrinsic Phase Sensitive Dual Inversion Recovery for Carotid Vessel Wall Imaging*. 24th Annual International Conference of Magnetic Resonance Angiography (MRA): September 19-21, 2012; Utrecht, Netherlands.
 - **Awarded First Prize for Poster Presentation, September 21, 2012**
- **D. Brotman**, Z. Zhang, and S. Sampath. *The effect of through-plane motion on left ventricular rotation: a study using slice following harmonic phase imaging*. Magn Reson Med. 2013 May; 69(5):1421-9.
- **D. Brotman**, Z. Zhang, and S. Sampath. *The effect of through-plane motion on left ventricular rotation: a study using slice following harmonic phase imaging*. The 19th Annual Meeting of the International Society for Magnetic Resonance in Medicine (ISMRM): May 7-13, 2011; Montreal, Canada.