

Adrian Lam

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EDUCATION/TRAINING

Ph.D. Candidate, Bioengineering

Dept of Biomedical Engineering, Georgia Institute of Technology
Minor: Digital Signal and Image Processing
Cumulative GPA: 3.72

Expected December 2015
Atlanta, GA

Siemens Healthcare

IDEA Sequence Programming (VB17)
IDEA Imaging Calculation Programming (VB17)

August 2012
Cary, NC

B.S., Biomedical Engineering

Dept of Biomedical Engineering, University of California, Davis
Cumulative GPA: 3.84, *cum laude*

June 2010
Davis, CA

WORK EXPERIENCE

Graduate Research Assistant

Georgia Institute of Technology
PI: Dr. John N. Oshinski

Aug 2010 – Present
Atlanta, GA

PhD Dissertation: Development of a Combined Angiography and Late Gadolinium Enhancement (LGE) MR Sequence

Development of a MR pulse sequence to acquire specialized images for guidance of interventional electrophysiology procedures to correct cardiac arrhythmias

- Used Siemens IDEA software to create a cardiovascular pulse sequence to combine acquisition of angiography and LGE scar images
- Custom ICE programs developed for both online and retrospective k-space sharing using Parc Data Store (PDS)
- Designed and implemented algorithms for semi-automated myocardial segmentation, image co-registration, 3D modeling and object manipulation
- Software pipeline developed in MATLAB to reconstruct MRI images into clinically impactful 3D models and 2D projections
- Produced coronary vein and myocardial scar maps to allow pre-procedural planning of pacemaker lead implantation to optimize patient benefit
- Pioneered development of pulmonary vein scar maps to quantify and compare extent of electrical isolation by cryoballoon/RF ablation
- Guided user interfaces (GUIs) developed and refined for user-friendly and efficient post-processing for all MR data

WORK EXPERIENCE (CONT.)

Shear Enhanced Diffusion Imaging

Collaborators: Drs Thomas Dixon/Xiaodong Zhong

- Adapted a 2D, echo-planar diffusion-weighted sequence for shear encoded imaging using IDEA platform
- Created mathematical models to spatially encode shear stress into images
- Allowed user control of gradient timing and amplitude for all diffusion-weighted gradient lobes

Contrast-Enhanced MRI for Coronary Vein Imaging

Collaborators: Drs Michael Lloyd/Luis Mora Vieira

- Compared the performance of coronary vein imaging by MRI against the current gold standard, x-ray venography
- Collaborated with cardiology fellow to evaluate MR venograms and x-ray venogram images for coronary vein image quality
- Proved MRI to be capable of imaging 90% of the coronary venous anatomy as compared to x-ray fluoroscopy and suitable for pre-procedural pacemaker implantation planning

Fluid Dynamics Modeling of the Aortic Valve Bypass Surgery

Collaborators: Drs Murali Padala/Vinod Thourani

- Created computational fluid dynamics (CFD) model to characterize blood flow in aortic valve bypass patients
- Discovered relationship between pre-surgical aortic valve pressure gradient and post-surgical flow in the thoracic aorta
- Gained proficiency in semi-automatic segmentation and 3D reconstruction on MR angiography images of the aorta
- Knowledge of CFD software (ANSYS FLUENT) in generating steady-state simulations
- Developed MATLAB scripts to transfer and process data across software platforms

Data Science Fellow

The Data Incubator

June 2015 – August 2015

San Mateo, CA

Intensive, 7-week data science bootcamp with a 2% acceptance rate that equips scientists and engineers with advanced degrees the tools to extract predictive capabilities from “big data”

Generic Drug Prediction

- Parsed FDA drug database (90k rows) into SQL to extract generic and brand name counterparts.
- Time-series analysis and matrix factorization used to predict date of generic drug launches and find seasonality trends in generic launch dates

WORK EXPERIENCE (CONT.)

Data Science Fellow
The Data Incubator

June 2015 – August 2015
San Mateo, CA

MapReduce for Multicore Computation

- Used Hadoop MapReduce to calculate Shannon entropy of English and Thai language from a 1GB portion of Wikipedia with Amazon Web Services
- Analyzed Wikipedia link relationships by developing a network of links separated by one degree
- Apache Spark used to evaluate user post statistics and user reputations from a 5GB segment of StackOverflow

Yelp Review Modeling

- Employed Python's scikit-learn module to develop predictive models for "star" ratings of restaurants on 1 million Yelp reviews using machine learning algorithms.
- Natural language processing used to extract positive/negative sentiment from user reviews and unique food bigram words corresponding to restaurants.

Research Assistant

Dept of Biomedical Engineering, University of California, Davis
PI: Dr. Laura Marcu

Sep 2008 – June 2010
Davis, CA

Europium as a Fluorescent Probe for Cancer Targeting

- Developed peptide-based fluorescent lifetime probe for glioblastoma cancer imaging
- Axiovision Microscopy Software used for fluorescent time-lapse microscopy experiments
- Trained undergraduate assistants in basic lab techniques and sterile cell culture

Intern

Center for Biophotonics Science & Technology
PI: Dr. Laura Marcu

June 2007 – Aug 2008
Sacramento, CA

In Vivo Phototoxicity Studies in Hamster Tissue

- Learned about fluorescent lifetime imaging and time-resolved spectroscopy systems.
- Characterized photobleaching of different tissue types

TECHNICAL SKILLS

Programming Languages (Ordered by Proficiency): MATLAB, Python, SQL, C++, Javascript, Java

Software Packages/Framework: Git, Hadoop, Spark, D3, Geomagic, ICEM, FLUENT, Tecplot 360, Segment, ITK, Selenium, Adobe Illustrator, Microsoft Office

Laboratory Skills: Histology slicing/staining, Cell culture and labeling, fluorescent microscopy, solid-phase peptide synthesis

Other: HIPAA Training Compliant, IRB certified

AWARDS & FUNDING

Winner of ATL Innovation Economy College Challenge	2014
Frontiers of Biomedical Imaging, Young Investigator Award	2013
American Heart Association (AHA) Predoctoral Fellowship	2012 – 2014
NIH T32 Imaging Training Grant	2010 – 2012
Presidential Undergraduate Fellowship, UC Davis	2009 – 2010
First Year Scholar - Dean's List, UC Davis	2007
Integrated Studies Honors Program	2006
UC Regents Scholarship	2006 – 2010

PROFESSIONAL AFFILIATIONS

International Society of Magnetic Resonance in Medicine (ISMRM)	2013 – Present
American Heart Association (AHA)	2014
Society of Cardiovascular Magnetic Resonance (SCMR)	2012
Tau Beta Pi	2009 – Present
Biomedical Engineering Society (BMES)	2007 – 2009

SCHOLARSHIP

Publications

- Wang L, Lam A et al. MRI Characterizations of Region Specific White Matter Hyperintensities and Vertebral Artery Stenosis. *Journal of Neurological Disorders*. (2014)
- Lam A et al. "Performance of 3D, Navigator-Echo Gated, Contrast-Enhanced, Magnetic Resonance Coronary Vein Imaging in Patients Undergoing CRT." *Journal of Interventional Cardiac Electrophysiology* 41.2 (2014): 155-160.
- Lam, A., et al. "Postsurgical hemodynamics of the aortic valve bypass operation evaluated with phase contrast magnetic resonance." *Journal of Magnetic Resonance Imaging* (2013).
- Fite BZ, Decaris M, Sun Y, Sun Y, Lam A, et al. "Noninvasive Multimodal Evaluation of Bioengineered Cartilage Constructs Combining Time-Resolved Fluorescence and Ultrasound Imaging". *Tissue Engineering Part C: Methods*. April 2011, 17(4): 495-504.

Oral Presentations

- "Coronary Vein Imaging by MRI vs Intra-Procedural X-Ray Venography for Targeted Left Ventricular Lead Placement in Cardiac Resynchronization Therapy" at the 27th MR Angiography Working Group, Cincinnati, OH. September 2015.
- "A 3D Shared K-space (Shark) Acquisition for the Automatic Co-Registration of Angiography and Late-Gadolinium Enhanced Images" at the North American IDEA Users Group Meeting, Boston, MA. July 2014.

SCHOLARSHIP

Oral Presentations (cont'd)

- “Whole Heart MRA vs Conventional Catheter-based Venography for Coronary Vein Imaging in CRT Patients” at the Frontiers of Biomedical Imaging Science IV, Nashville, TN. July 2013.
- “MRI for Visualization of Coronary Vein Branches Used for Pacemaker Lead Implantation” at the International Society of Magnetic Resonance in Medicine, Milan, Italy, May 2014.

Posters

- “Late Gadolinium Enhancement for Left Ventricular Lead Guidance in Cardiac Resynchronization Therapy: Comparison of 3D Free-breathing IR-FLASH vs 2D Breath-hold Phase-Sensitive IR”. International Society for Magnetic Resonance in Medicine, Toronto, Canada. March 2015.
- “Whole Heart MRA vs Conventional Catheter-based Venography for Coronary Vein Imaging in CRT Patients”. Frontiers of Biomedical Imaging, Nashville, TN. July 2013.
- “Pre-Operative Imaging of Coronary Veins in Patients Undergoing CRT: How Good Is Whole Heart MRA Compared to Intraoperative Catheter-Based Venography?”. International Society for Magnetic Resonance in Medicine. Salt Lake City, UT. April 2013.
- “Hemodynamic characterization of Aortic Valve Bypass Surgery (AVBS) using patient-specific computational models based on MRA and PCMR”. SCMR/ISMRM Flow and Motion Workshop, Orlando FL. Jan 2012.
- “Post-surgical hemodynamics in aortic valve bypass (AVB) patients evaluated with phase contrast magnetic resonance (PCMR)”. Society for Cardiovascular Magnetic Resonance, Orlando FL. Feb 2012.
- “Europium as a Molecular Probe”. Undergraduate Research Conference, Davis, CA. May 2010.

TEACHING EXPERIENCE

Teaching Assistant

Department of Biomedical Engineering, Georgia Institute of Technology

Jan 2011 – Jan 2012

Atlanta, GA

Course: BMED4602 – Capstone Design

- Reviewed and provided feedback for project design specifications, prototypes and written reports
- Addressed student issues to ensure proper communication and collaboration within groups
- Achieved successful prototype creation in all eight groups for section

TEACHING EXPERIENCE (CONT.)

Teaching Assistant

Department of Biomedical Engineering, Georgia Institute of Technology

Jan 2011 – Jan 2012

Atlanta, GA

Course: BMED2300 – Problems in Biomedical Engineering II

- Guided students through the engineering design process from analysis to redesign to prototype creation
- Managed student groups to ensure timely and quality submission of deliverables
- Ensured proper documentation of research and development in design notebooks

Teaching Assistant

Department of Biomedical Engineering, UC Davis

Spring Qtr 2009, Spring Qtr 2010

Davis, CA

Course: BIM 108 – Signals and Systems

- Led review sessions to reinforce understanding of digital signal processing
- Guided students through homework problems
- Developed practice problems to gauge student comprehension during sessions

Tutor

UC Davis Learning Skills Center

Oct 2007 – June 2010

Davis, CA

Courses: General Chemistry, Linear Algebra, Differential Equations, Newtonian Physics

- Employed MIFF (Management, Involvement, Feedback, Focus) techniques during tutoring in residence halls, group sessions, and one-on-one lessons
- Nurtured critical thinking and problem solving skills within students

SERVICE

BGA Member

Georgia Institute of Technology

Aug 2010 - Present

Atlanta, GA

- Promoted science education by leading science enrichment activities for K-12 students
- Corresponded with prospective graduate students during BMED and BIOE recruitment week

Biomedical Engineering Peer Advisor

Dept of Biomedical Engineering, University of California, Davis

Aug 2008 – June 2010

Davis, CA

- Helped undergraduate students design balanced course schedules
- Informed students of academic resources available to maximize success
 - Discussed opportunities and career paths in biomedical engineering