

CURRICULUM VITAE

RESEARCH INTERESTS

- Cardiac Electrophysiology
- Computational Electrophysiology
- Scientific Computing & Visualization
- Bioelectric Signal Processing
- Cardiac Device & Diagnostics
- Point of Care Health Care

EDUCATION

Ph.D. in Bioengineering, University of Utah, 2015

Advisor: Robert S. MacLeod

Committee Members: Alexey Zaitsev, Edward Hsu, Edward DiBella, Scott Youngquist

Dissertation: *Bioelectric Source Characterization of Acute Myocardial Ischemia*

M.S. in Computer Science & Engineering, University of Notre Dame, 2005

Advisor: Jesus A. Izaguirre

Dissertation: *Using Design Patterns in Scientific Applications*

B.S. in Computer Engineering Technology, Andrews University, 2000

PROFESSIONAL EXPERIENCE

RESEARCH EXPERIENCE

Postdoctoral Scientist, Fall 2015 - present

Efimov Lab, George Washington University

Research Assistant, Fall 2007 - Summer 2015

Scientific Computing & Imaging Institute, University of Utah

Cardiovascular Research & Training Institute, University of Utah

TEACHING EXPERIENCE

Teaching Assistant, Spring 2009

Systems Physiology, Biomedical Engineering Department, University of Utah

Mentor, Spring 2011

Undergraduate Senior Project, Biomedical Engineering Department, University of Utah

INDUSTRY EXPERIENCE

Engineer, Sep 2000 - July 2002

Business Analyst, Aug 2002 - July 2004

Intellectual Property Manager, Aug 2004 - Jun 2007

Whirlpool Corporation, Benton Harbor, Michigan

PUBLICATIONS

BOOKS

- Using Design Patterns in Scientific Applications - A Case Study in CompuCell3D. VDM Verlag Dr. Muller, 2007 (ISBN: 978-3-8364-3563-5)

JOURNALS

- C. Gloschat, **K. Aras**, S. Gupta, N.R. Faye, H. Zhang, R.A. Syunyaev, R.A. Pryamonosov, J. Rogers, M.W. Kay, and I.R. Efimov. RHYTHM: An Open Source Imaging Toolkit for Cardiac Panoramic Optical Mapping. Nature Scientific Reports. 2018 Feb
- A. Rodenhauer, W.W. Good, B. Zenger, J. Tate, **K. Aras**, B. Burton and R.S. MacLeod. PFEIFER: Preprocessing Framework for Electrograms Intermittently Fiducialized from Experimental Recordings. Journal of Open Source Software 2018 Jan; 3(21),472.
- **Aras KK**, Kay MW, Efimov IR. Ventricular Fibrillation: Rotors or Foci? Both!. Circulation Arrhythmia Electrophysiology 2017 Dec;10(12):e006011.
- Gloschat CR, Koppel AC, **Aras KK**, Brennan JA, Holzem KM, Efimov IR. Arrhythmogenic and metabolic remodeling of failing human heart Journal of Physiology. 2016 March; 594(14).
- **K. K. Aras**, B. M. Burton, D. J. Swenson and R.S. MacLeod. Spatial Organization of Acute Myocardial Ischemia. Journal of Electrocardiology 2016 Feb
- **K. K. Aras**, W. Good, J. Tate, B. M. Burton, D. Brooks, J. Coll-Font, O. Doessel, W. Schulze, D. Potyagaylo, L. Wang, P. Van Dam and R.S. MacLeod. Experimental Data and Geometric Analysis Repository - EDGAR, Journal of Electrocardiology 2015 Nov-Dec; 48(6):975-81

- **K. K. Aras**, B. M. Burton, D. J. Swenson and R. S. MacLeod. Epicardial Sensitivity of Electrical Markers to Acute Myocardial Ischemia, *Journal of Electrocardiology* 2014 Nov-Dec ; 47(6):836-841
- T. Cickovski, **K. K. Aras**, M. Swat, R. M. H. Merks, T. Glimm, M.S. Alber, J. A. Glazier, S. A. Newman, J. A. Izaguirre. From Genes To Organisms Via The Cell: A Problem Solving Environment for Multicellular Development, *Computing in Science and Engineering*, 2007;9(4):50-60

CONFERENCES

- J. Tate, T. Pilcher, **K. K. Aras**, B. M. Burton and R. S. MacLeod. Verification of a Defibrillation Simulation Using Internal Electric Fields in a Human Shaped Phantom. *Computers in Cardiology* 2010, pages 689-692
- **K. K. Aras**, S. Shome, D.J. Swenson, J. G. Stinstra and R. S. MacLeod. Electrocardiographic Response of the Heart to Myocardial Ischemia. In A. Murray, editor, *Computers in Cardiology* 2009, pages 105-108, 2009
- D. J. Swenson, J. G. Stinstra, B. M. Burton, **K. K. Aras** and R. S. MacLeod. Wave Equation Based Interpolation on Volumetric Cardiac Electric Potentials. In A. Murray, editor, *Computers in Cardiology* 2009, pages 217-220, 2009
- D. J. Swenson, J. G. Stinstra, B. M. Burton, **K. K. Aras** and R. S. MacLeod. Evaluating the Effects of Border Zone Approximations with Subject Specific Ischemia Models. *World Congress on Medical Physiology and Biomedical Engineering*, volume 25/IV, pages 1680-1683, Heidelberg, 2009. Springer.

ABSTRACTS

- K. K. Aras, B. Cathey, and I.R. Efimov. Critical Cardiac Wavelength Volume Predicts Arrhythmia Vulnerability in the Human Left Ventricle, *AHA Scientific Sessions*, Anaheim, 2017
- K. K. Aras, B. Cathey, and I.R. Efimov. Minimum Reentrant Path Volume Predicts Arrhythmia Vulnerability in the Human Left Ventricle, *Biomedical Engineering Society Conference*, Phoenix, Arizona, 2017
- K. K. Aras and I.R. Efimov. Minimum Reentrant Path Volume Predicts Arrhythmia Vulnerability in the Human Left Ventricle, *Gordon Research Conference*, Ventura, California, 2017
- K. K. Aras, B. M. Burton, D. J. Swenson and R. S. MacLeod. Spatio-Temporal Evolution of Acute Myocardial Ischemia, *Utah Biomedical Engineering Conference*, Salt Lake City, 2012
- K. K. Aras, D. J. Swenson and R. S. MacLeod. Origin of Electrical Myocardial Response to Acute Ischemia is not limited to Sub-endocardium. *International Society of Computerized Electrocardiology*, San Jose, 2011

INVITED TALKS

- Epicardial Sensitivity of Electrical Markers to Acute Myocardial Ischemia. International Society of Computerized Electrocardiology, Atlantic Beach, Florida, 2014
- Spatio-Temporal Evolution of Acute Myocardial Ischemia. International Congress on Electrocardiology, Glasgow, Scotland, 2013
- Heterogeneous Myocardial Electrographic Response During Ischemia, Park City, Utah, 2010
- Electrographic Response of the Heart to Myocardial Ischemia, Park City, Utah, 2009

GRANTS

NIH SBIR/STTR Phase I Basude (PI) 09/01/2018 - 08/31/2019

High-Definition Conformal Devices for Arrhythmia Dynamics Mapping and Ablation Therapy

The goal is to develop high resolution mapping catheter technology for arrhythmia sensing and dynamics mapping

Role: Co-investigator

HONORS & AWARDS

- Jos Willems Young Investigator Recipient, International Society for Computerized Electrocardiology (ISCE), 2014
- Young Investigator competition finalist, International Congress on Electrocardiology (ICE), 2013
- University of Utah, Biomedical Engineering Department Scholarship, 2007-2014
- Andrews University, Computer Science Department Scholarship, 1998-2000

COMMUNITY SERVICE ACTIVITIES

- Transporter for Meals on Wheels, Salt Lake City, Utah, 2007-2009
- Volunteer for Habit for Humanity & United Way, Benton Harbor, Michigan, 2004-2006

REFERENCES

Available upon request