

Aaron M. Kyle, Ph.D.

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Office: 363 Engineering Terrace, 500 W. 120th St., New York, NY 10027

Education

Purdue University May 2007
Doctor of Philosophy WEST LAFAYETTE, IN
Biomedical Engineering

Dissertation: *An Acoustic Transmission Line Model Applied to Liquid Filled Tubes: Measurements and Model Predictions*

Co-Advisors: Drs. George R. Wodicka, J. Stuart Bolton

Kettering University May 2002
Bachelor of Science FLINT, MI
Electrical Engineering

Thesis: *Feasibility and Design of a Vision System for Stamped Parts*

Professional Experience (Academic)

Co-Founder/Lead Instructor November 2013
HypotheKids (Hk) Maker Lab NEW YORK, NY

Created and teach engineering design to students from STEM-underrepresented populations. The Hk Maker lab is an intensive summer program in which high school students from disadvantaged schools throughout New York are introduced to and challenged with implementing the engineering design process.

Senior Lecturer in Biomedical Engineering January 2010 – Present
Columbia University NEW YORK, NY
Department of Biomedical Engineering
Fu Foundation School of Engineering and Applied Sciences

Instructor for undergraduate laboratory courses (BMEN E3810 & E3820). Courses cover a broad variety of topics including, principles of microscopy and imaging, design of medical data acquisition systems, microfluidics, biomedical measurement using ultrasound, basics of cell culture, etc.

Instructor for Senior Design Courses (BMEN E3910 & E3920). Guiding students towards building and testing clinically relevant biomedical devices. Efforts primarily pertain to assisting with electronics development, signals acquisition, and digital signal processing.

Created and instructor for novel course, Bioinstrumentation (BMEE E4740). Students learn practical applications of electrical circuitry in the context of single biomedical device: a cardiac pacemaker.

Chair of ABET Committee. Accumulating pertinent materials, defining parameters and metrics of interest in preparation for upcoming self-study and ABET examination of Biomedical Engineering at Columbia University.

Undergraduate Committee. Spearheaded the revision of the undergraduate curriculum, which was implemented in the Fall '15.

Coordinator for TA assignments within the Department

BME Instructor, Summer Program for High School Students June 2010 – July 2015
Columbia University New York, NY
School of Continuing Education

Gave lectures and oversaw laboratory procedures for 40-50 high school students. Course focused on the effects of physical stimuli on cells.

Postdoctoral Fellow June 2007–December 2009
Indiana Center for Vascular Biology and Medicine INDIANAPOLIS, IN
Indiana University School of Medicine

Investigated the pro- or anti-angiogenic effects of low energy electromagnetic fields on vascular progenitor and stem cells.

Designed and implemented an algorithm to automatically analyze long duration digital ECG signals for arrhythmic events

Designed an electromagnetic system for trapping magnetic nanoparticle impregnated endothelial cells to magnetized steel stents.

Research Assistant August 2002–May 2007
Purdue University WEST LAFAYETTE, IN
Weldon School of Biomedical Engineering

Investigated the feasibility of an acoustic guidance system for IV catheters. Research primarily concerned experimentally examining nearly-planar sound propagation through liquid filled tubes. Experimental observations were compared to predictions from an acoustic transmission line model.

Professional Experience (Industry)

Advisory Board Member
Luso Labs

May 2016 – Present
NEW YORK, NY

Providing technical expertise for Columbia-based startup company that is creating a low-cost automated method to detect cervical cancer in low resource countries.

Advisory Board Member
Neopenda

October 2015 – Present
NEW YORK, NY

Providing technical expertise for Columbia-based startup company that is creating a low-cost neonatal vital signs monitor for use in developing countries.

Advisory Board Member
Jibon Health

January 2012 – Present
NEW YORK, NY

Providing technical guidance in the design and manufacture of a low-cost device to mitigate postpartum hemorrhage in low resource settings.

Engineering Consultant
Gallilead Inc.

January 2010 – January 2013
INDIANAPOLIS, IN

Principal Engineer designing, testing, and optimizing liquid metal-based leads meant to mitigate failure due to fracture in implantable cardiac pacemakers and cardioverter defibrillators.

Summer Hire
Los Alamos National Laboratory

June 2002-August 2002
LOS ALAMOS, NM

Worked in the DX-7 section – Low and Medium Power X-ray Sources -
Aided in the development of techniques to measure spot size of x-ray dot from generator 2.3 MV x-ray generator. .

Co-op Student
Square D Company

July 1997-May 2002
LINCOLN, NE

Designed a machine vision system that utilized digital camera to measure dimensions and detect flaws in stamped metal parts. Also performed PLC programming and implemented real-time measurement system for parts sorting machine.

Peer-Reviewed Publications

A.M. Kyle, M. Carapezza, C. Kovich. “Hk Maker Lab: A summer engineering program for high school students,” *Journal of STEM Outreach*, [S.l.], v. 1, n. 1, Jan. 2018. Available at: <<http://ejournals.library.vanderbilt.edu/ojs/index.php/JRLSO/article/view/4418>>.

J. Kang, K.S. Tyan, K. Jin, A.M. Kyle, "Novel color additive for chlorine disinfectants corrects deficiencies in spray surface coverage and wet-contact time, and checks for correct chlorine concentration," *American Journal of Infection Control* (accepted for publication)

J. Kang, K.S. Tyan, K. Jin, A.M. Kyle, "Field-testing of a novel color indicator added to chlorine solutions used for decontamination of surfaces in Ebola Treatment Units," *Journal of Hospital Infection*, in press. Available at: <http://www.sciencedirect.com/science/article/pii/S019567011730628X?via%3Dihub>.

A.M. Kyle, D.C Jangraw, M.B. Bouchard, M.E. Downs, "BMEE E4740: A Project-Based Course in Bioinstrumentation," *IEEE Transactions on Engineering Education*, 59(4), pp. 52-48 (2016).

S. Han, P.I. Rogers, J. Kihlken, J. Wafel, C. Bull, M. Deuter-Reinhard, D. Feng, J. Xie. A. Kyle, S. Merfeld-Clauss, B.H. Johnstone, D.O. Traktuev, P.S. Chen, J.R. Lindner, K.L. March, "Intravenous xenogeneic transplantation of human adipose-derived stem cells improves left ventricular function and microvascular integrity in swine myocardial infarction model", *Catherization and Cardiovascular Interventions*, accepted for publication.

Patents and Intellectual Property

International Patent Application No. PCT/US2010/060078, Unpublished (filing date December 13, 2010) (Keith L. March, applicant; William J. Combs, applicant; Aaron M. Kyle, applicant; Nichole M. Leahy-Glass, applicant).

Conferences Abstracts and Papers

A.M. Kyle, R.L. Sattler, H.T. Zhao, C. Kovich, "HYPOTHEkids Maker Lab: A Summer Program in Engineering Design for High School Students" *ASEE Annual Conference and Exposition*, New Orleans, LA, June 2016.

M.B. Bouchard, M.E. Downs, D. C. Jangraw, A. M. Kyle, "A Hands-On Course Teaching Bioinstrumentation through the Design and Construction of a Benchtop Cardiac Pacemaker," *Proceedings of the 35th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Osaka, Japan, July 2013.

A. Kyle, M. B. Bouchard, M. E. Downs, D. C. Jangraw, "Biomedical Instrumentation from Start to Finish: A Project-Based Undergraduate Course," in *2012 BMES Annual Fall Meeting*, Atlanta, GA, 2012.

G.K. Zhang, H.S. Ahmed, P. Desai, J. Yang, M. Michael, A.M. Kyle, E.M.C. Hillman, M. Nakakeeto-Kijjambu, R. Sahni, R. Polin, "Vital Signs Monitor for Low-Resource Hospitals," 2012 Pediatric Academic Societies Annual Meeting, Boston, MA, May 2012.

A.M. Kyle, P.I. Rogers, S. Han, P.-S. Chen, K.L. March, "LifeShirt Acquisition System to Monitor ECG from Ambulatory Swine and the Implementation of an Arrhythmia Detection Algorithm," *Proceedings of the 31st Annual International Conference of the IEEE*

Engineering in Medicine and Biology Society, Minneapolis, MN, Minneapolis, MN, September 2009.

A.M. Kyle, G. Albors, G.R. Wodicka, E.J. Juan, “Sound Propagation in Liquid-Filled Arterial Segments: Measurements and Model Predictions”, *Proceedings of the 29th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Lyon, France, August 2007.

G. Albors, A.M. Kyle, G.R. Wodicka, E.J. Juan, “Computer Simulation Tool for Predicting Sound Propagation in Air-Filled Tubes with Acoustic Impedance Discontinuities”, *Proceedings of the 29th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Lyon, France, August 2007.

A. Kyle, J. Bazil, S. Bhatia, B. Moerdyk, A. Brightman, G. Graber, A. Sieving, T. Talavage, A. Rundell, “Bioinstrumentation Instruction through Hybrid Wet/Circuit Laboratory Activities,” in *ASEE Annual Conference and Exposition*, Chicago, IL, June 2006.

A.M. Kyle, S.L. Ordonez, E.J. Juan, J.S. Bolton, G.R. Wodicka, “Wave propagation in liquid-filled tubes: Measurements and Model Predictions,” in *151st Meeting of the Acoustical Society of America*, Providence, RI, June, 2006.

A. Kyle, S. Bhatia, J. Bazil, B. Moerdyk, A. Brightman, G. Graber, A. Sieving, T. Talavage, A. Rundell, “A Laboratory Encouraging Learning of Bioinstrumentation, Bioelectric, and Measurement Principles,” in *2005 BMES Annual Fall Meeting*, Baltimore, MD, 2005.

Invited Lectures

A. Kyle “Hk Maker Lab: Engineering Design for High School Students,” NSBE Healthcare Innovation Special Interest Group Quarterly Town Hall Webinar, July 17, 2018

A. Kyle “BME Senior Design as a Platform for Creating Appropriate Technologies,” 2017 Biomedical Engineering Society Annual Meeting - Engineering Solutions to Address Healthcare Disparities, Oct. 12, 2017

A. Kyle “BME Senior Design as a Platform for Creating Appropriate Technologies,” 2017 Biomedical Engineering Society Annual Meeting - Engineering Solutions to Address Healthcare Disparities, July 3, 2017

A. Kyle “Biomedical Engineering Education: Hands-on Learning & Design at Columbia University,” 2017 Columbia University – Pontificia Universidad Católica de Chile BME Symposium, Santiago, Chile, Mar. 20, 2017.

A. Kyle “Biomedical Engineering Education: Hands-on Learning & Design at Columbia University,” 2015 Beihang University-Columbia University Bilateral BME Symposium, Beijing, China, Nov. 17, 2015.

A. Kyle, "Senior Design as a Platform for the Development of Appropriate Healthcare Technologies," 2012 University of Utah School of Medicine Extreme Affordability Conference, Salt Lake City, UT, March 23, 2012.

A. Kyle, "Development of Neonatal Care Devices for Mulago Hospital at Columbia University," Department of Pediatric Meeting, Kampala Uganda, July 28, 2011.

Funding

- Venturewell** **Mar '18 -**
Project Title: *Project Nate (Stage 1 E-Team Grant)*
PI Status: PI, Advisor
Amount Awarded: \$5,000
Portion of Award: 100%
- Venturewell** **Mar '18 -**
Project Title: *MoLabs (Stage 1 E-Team Grant)*
PI Status: PI, Advisor
Amount Awarded: \$5,000
Portion of Award: 100%
- Venturewell** **Sept '17 -**
Project Title: *Experiential Course in Global Health Technology and Entrepreneurship (Faculty Grant)*
PI Status: Co-PI
Amount Awarded: \$20,000
Portion of Award: 0%
- Venturewell** **Mar '17 -**
Project Title: *Lumenda (Stage 1 E-Team Grant)*
PI Status: PI, Advisor
Amount Awarded: \$5,000
Portion of Award: 100%
- Venturewell** **Mar '17 -**
Project Title: *AdneXXa (Stage 1 E-Team Grant)*
PI Status: PI, Advisor
Amount Awarded: \$5,000
Portion of Award: 100%

NIH (R25)

Project Title: *Enhancing Secondary School STEM Education for Students and Teachers through Biomedical Engineering Design*

PI Status: PI

Amount Awarded: \$1,229,998

Portion of Award: 100%

Venturewell**May '15 -**

Project Title: *Kinnos, Inc. (Stage 1 & 2 E-Team Grant)*

PI Status: PI, Advisor

Amount Awarded: \$25,000

Portion of Award: 100%

Venturewell**March '15 -**

Project Title: *Innovation of Impactful Neonatal Care Devices for Use in Low Resource Settings through Biomedical Engineering Senior Design (Sustainable Vision Grant)*

PI Status: PI

Amount Awarded: \$33,100

Portion of Award: 100%

USAID**April '15 – August '16**

Project Title: *Colored Bleach Mist Formula to Ensure Proper Decontamination of Healthcare Workers*

PI Status: Co-PI, Advisor

Amount Awarded: \$695,497

Portion of Award: 100%

Mathworks, Inc.**April '12-June '15**

Project Title: *Biomedical Instrumentation: Sensing and Actuating Living Systems (Curriculum Development Grant)*

PI Status: PI

Amount Awarded: \$39,699

Portion of Award: 100%

NCIIA E-Team Grant**Nov. 2011-Dec. '14**

Project Title: *Uzima Vital Signs Monitor*

Amount Awarded: \$18,500

PI Status: PI

Portion of Award: 100%

Awards and Honors

- **Columbia University Presidential Award for Outstanding Teaching** May 2017
- **Janette and Armen Avanesians Diversity Award** May 2016
- **The Kim Award for Faculty Involvement** May 2012

- **Keynote Speaker, National Society of Black Engineers**
Columbia University A Walk for Education Event

October 23, 2011
- **Dollens Scholarship**

Graduate student scholarship awarded on behalf on the Guidant Foundation in honor of Ronald Dollens.

July 2006
- **Best Student Paper Award, Engineering Acoustics, 151st Meeting of the Acoustical Society of America**

Awarded for paper: “Wave Propagation in Liquid-Filled Tubes: Measurements and Model Predictions”

July 2006
- **Donnan Dissertation Fellowship**

Fellowship awarded by Purdue University’s Graduate School to Ph.D. students in their final year of research. Allows recipients to focus on research and dissertation writing without being encumbered by additional funding duties.

August 2006
- **College of Engineering Outstanding Graduate Student**

Outstanding Graduate Student in the Weldon School of Biomedical Engineering.

April 2006
- **College of Engineering Nominee, Graduate School Excellence in Teaching Award**

One of two nominees selected from the College of Engineering to receive consideration for the Graduate School’s top Graduate Student teaching award

April 2006
- **Purdue University Graduate Student Award for Outstanding Teaching**

April 2006
- **Magoon Award for Excellence in Teaching**

This award recognizes outstanding teaching assistants and instructors within Purdue’s College of Engineering.

April 2006
- **Neal Fearnot Prize for Outstanding Summer Seminar**

The prize is awarded to the presenter in the BME Summer Seminar series who receives the best evaluations from faculty, staff, and students.

December 2005
- **NSF Integrated Graduate Education and Research Training Fellowship**
Program in Therapeutic and Diagnostic Devices

This fellowship aims to recruit outstanding doctoral engineering students and augment a strong background in engineering fundamentals with significant interdisciplinary expertise in the biomedical sciences.

2002-2004

Professional Organizations and Service

- Steering Committee, 2017 BMES Coulter Workshop August 2016 – Present
- *Ad Hoc* Reviewer, GEM Consortium Fellowship November 2016
- *Ad Hoc* Reviewer, NIH Science Education Partnership Award Study Section September 2016
- Advisor, Tau Beta Pi, New York-a December 2011 – December 2016
- Howard Hughes Medical Institute Tutoring Program at Crispus Attucks Magnet High School, Indianapolis, IN Fall 2008
- Purdue University Internal Advisory Committee for Reform of *Engineering Graduate Programs* Spring 2006
- Founding Member, Webmaster, Purdue University Biomedical *Engineering Graduate Student Association* Spring 2006
- Webmaster, Purdue University Black Graduate Association 2004-2006
- IEEE, Engineering in Medicine and Biology Society 2006-Present
- Biomedical Engineering Society 2005 - Present
- National Society of Black Engineers 2004-2005
- Tau Beta Pi (Engineering Honor Society) 2000-Present
- Eta Kappa Nu (Electrical Engineering Honor Society) 2000-Present