

Ethan O. Kung, Ph. D.
235 Fluor Daniel Bldg, Clemson, SC 29634
Mechanical Engineering & Bioengineering, Clemson University
ekung@clemson.edu (650) 307-5557 <http://www.cmerl.com>



ACADEMIC APPOINTMENTS

Associate Professor, Mechanical Engineering, Clemson University, 2020-present
Assistant Professor, Mechanical Engineering, Clemson University, 2014-2020
Assistant/Associate Professor (joint appointment), Bioengineering, Clemson University, 2016-present
Faculty Scholar, School of Health Research, Clemson University, 2015-present

EDUCATION

Stanford University (Stanford, CA), Ph.D. Bioengineering – Medical Devices, 2010 *Advisor*: Dr. Charles A. Taylor
Stanford University (Stanford CA), M.S. Bioengineering – Medical Devices, 2006
Queen’s University (Kingston, ON), B.Sc. Electrical Engineering Honours First Class, 2003

CERTIFICATE TRAINING

Clemson University (Clemson, SC), Effective Online Teaching for Student Engagement Certificate, Office of Teaching Effectiveness and Innovation, 2020
Clemson University (Clemson, SC), Critical Thinking Pedagogy Certificate, Clemson Thinks², 2018
University of California San Diego (La Jolla, CA), The College Classroom Certificate, Center for Teaching Development, 2014

HONORS AND AWARDS

CAREER Award National Science Foundation, 2018-2023
Dean’s Faculty Fellow Award Clemson University, 2018-2021
Nominated for Full Membership, Sigma Xi, The Scientific Research Honor Society, 2020
3rd Place Winner Science as Art Competition Clemson University, 2020
Eastman Award for Excellence Clemson University, 2017-2018
Congenital Heart Defect Research Award The Children’s Heart Foundation, 2016

Postdoctoral Fellowship Award American Heart Association, 2012- 2014

1st Place Winner PhD Student Paper Competition ASME Summer Bioengineering Conference, 2010

Postgraduate Scholarship PhD Natural Sciences and Engineering Research Council of Canada, 2006-2009

Postgraduate Scholarship MS Natural Sciences and Engineering Research Council of Canada, 2005-2006

Dean's Scholar Award Queen's University, 2000-2002

PROFESSIONAL EXPERIENCES

American Society of Mechanical Engineers, *Associate Editor*, Journal of Biomechanical Engineering, 2021- current

American Society of Mechanical Engineers (Bioengineering Division), *Member*, Executive Committee, 2024- current

American Society of Mechanical Engineers (Bioengineering Division), *Chair*, Industry Committee, 2021-2024

American Society of Mechanical Engineers (Bioengineering Division), *Vice-chair*, Industry Committee, 2018-2021

Yates, McLamb & Weyher (Raleigh, NC), *Litigation Consultant*, Oct-Dec 2019

University of California San Diego (La Jolla, CA), *Postdoctoral Fellow*, Mechanical & Aerospace Engineering, 2011-2014 *Advisor*: Dr. Alison Marsden

Great Ormond Street Hospital for Children (London, UK), *Visiting Research Scholar* (Leducq Foundation Network), 9/09/2012-9/23/2012 and 10/18/2012-10/26/2012

Politecnico di Milano (Milan, Italy), *Visiting Research Scholar* (Leducq Foundation Network) 9/23/2012-10/18/2012 and 3/12/2013-3/27/2013

Clemson University (SC, USA), *Visiting Research Scholar* (Leducq Foundation Network) 5/4/2012-5/15/2012

PUBLICATIONS

1. Dave R, Luraghi G, Sierad L, Migliavacca F, **Kung E**. "Shear Stress Quantification in Tissue Engineering Bioreactor Heart Valves: A Computational Approach." *Journal of Functional Biomaterials*. 15(3):76. <https://doi.org/10.3390/jfb15030076> (2024)
2. Umo A, **Kung E**. "A Protocol for Coupling Volumetrically Dynamic In vitro Experiments to Numerical Physiology Simulation for A Hybrid Cardiovascular Model" *IEEE Transactions on Biomedical Engineering*. DOI: 10.1109/TBME.2022.3216542 (2022)
3. Shah S, Behrle N, Salek SM, Farahmand M, Goyal A, Divekar A, **Kung E**. "Reproducing Patient-Specific 3D-Model of Pulmonary Artery Hemodynamics by Means of *In Vitro* Benchtop Simulation" *Journal of 3D Printing in Medicine* DOI: 10.2217/3dp-2022-0004 (2022)

4. Gedney R, **Kung E**, Mehta V, Brown A, Bridges M, Veeraswamy R. "Plaque Contact Surface Area and Flow Lumen Volume Predict Stroke Risk in Extracranial Carotid Artery Stenosis" *J Vasc Surg*. DOI: 10.1016/j.jvs.2022.03.008 (2022)
5. Garven E, Rodell C, Shema K, Govender K, Cassel S, Ferrick B, Kupsho G, **Kung E**, Spiller K, Stevens R, Throckmorton A. "Tunable Blood Shunt for Neonates With Complex Congenital Heart Defects" *Front Bioeng Biotechnol* DOI: 10.3389/fbioe.2021.734310 (2022)
6. Pradhan A, Scaringi J, Kaminsky L, Arena R, Myers J, **Kung E**. "Systematic Review and Regression Modeling of the Effects of Age, Body Size, and Exercise on Cardiovascular Parameters in Healthy Adults" *Cardiovascular Engineering and Technology* DOI: 10.1007/s13239-021-00582-3 (2021)
7. Villa C, Zafar F, Lorts A, **Kung E**. "Hemodynamic Response to Device Titration in the Shunted Single Ventricle Circulation: A Patient Cohort Modeling Study" *ASAIO Journal*. 68(2):268-274 DOI: 10.1097/MAT.0000000000001433 (2021)
8. Thirugnanasambandam M, Canchi T, Piskin S, Karmonik C, **Kung E**, Menon P, Avril S, Finol E. "Design, Development, and Temporal Evaluation of a Magnetic Resonance Imaging-Compatible In Vitro Circulation Model Using a Compliant Abdominal Aortic Aneurysm Phantom" *J Biomech Eng*. 143:5 (2021).
9. **Kung E**, Baker C, Corsini C, Baretta A, Biglino G, Arbia G, Marsden A, Taylor A, Quail M, Vignon-Clementel I, Pennati G, Migliavacca F, Schievano S, Hlavacek A, Dorfman A, Hsia TY, Figliola R, MOCHA Investigators. "Hemodynamics After Fontan Procedure are Determined by Patient Characteristics and Anastomosis Placement Not Graft Selection: A Patient-Specific Multiscale Computational Study" *Pre-print*. DOI: 10.1101/2021.10.03.21264033
10. Gupta A, Gillett C, Gerard P, Cheung M, Mynard JP, **Kung E**. "Predictive Models for Pulmonary Artery Size In Fontan Patients" *J Cardiovasc Transl Res*. 14(4):782-789. DOI: 10.1007/s12265-020-09993-4 (2021)
11. Gupta A, **Kung E**. "A Protocol for Automated a-posteriori Adaptive Meshing with SimVascular: A Test Case" *BMC Research Notes*. DOI: 10.1186/s13104-020-05057-7 (2020)
12. Farahmand M, Kavarana MN, Trusty PM, **Kung EO**. "Target Flow-Pressure Operating Range for Designing a Failing Fontan Cavopulmonary Support Device" *IEEE Transactions on Biomedical Engineering*. DOI: 10.1109/TBME.2020.2974098 (2020) **Featured Article**
13. Mirzaei E, Farahmand M, **Kung E**. "An Algorithm for Coupling Multi-Branch In-vitro Experiment to Numerical Physiology Simulation for a Hybrid Cardiovascular Model" *Int J Num Meth Biomed Eng*. e3289 (2019)
14. Kaufmann J, **Kung E**. "Factors Affecting Cardiovascular Physiology in Cardiothoracic Surgery: Implications for Lumped-parameter Modeling" *Front. Surg*. 6:62 (2019)
15. **Kung E**, Corsini C, Marsden A, Vignon-Clementel I, Pennati G, Figliola R, Hsia TY, MOCHA. "Multiscale Modeling of Superior Cavopulmonary Circulation: Hemi-Fontan And Bidirectional Glenn Are Equivalent" *Semin Thorac Cardiovasc Surg*. DOI: 10.1053/j.semtevs.2019.09.007 (2019)
16. Farahmand M, Kavarana M, **Kung E**. "Risks and Benefits of Using a Commercially Available Ventricular Assist Device for Failing Fontan Cavopulmonary Support: A Modeling Investigation" *IEEE Transactions Biomed Eng*. DOI:10.1109/TBME.2019.2911470 (2019)
17. **Kung E**, Farahmand M, Gupta A. "A Hybrid Modeling Framework Combining In-Vitro Experiment With Computational Physiology Simulation for Cardiovascular Device Testing." *J Biomech Eng*. 141(5):051012 (2019)

18. Conover T, Hlavacek A, Migliavacca F, **Kung E**, Dorfman A, Figliola R, Hsia TY. "An Interactive Simulation Tool for Patient-Specific Clinical Decision Support in Single Ventricle Physiology." *J Thoracic Cardiovascular Surg.* 155(2):712-721 (2018)
19. Schmidt T, Rosenthal D, Reinhartz O, Riemer RK, He F, Hsia TY, Marsden A, **Kung E**, MOCHA Investigators. "Superior Performance of Continuous Over Pulsatile Flow Ventricular Assist Devices in the Single Ventricle Circulation: A Computational Study." *J Biomech.* 52:48-54 (2017)
20. Mechoor R, Schmidt T, **Kung E**. "A Real-Time Programmable Pulsatile Flow Pump For In-Vitro Cardiovascular Experimentation." *Journal of Biomechanical Engineering.* 138(11):111002 (2016)
21. Van De Bruaene A, Claessen G, Gerche A, **Kung E**, Marsden A, Meester P, Devroe S, Bogaert J, Claus P, Heidbuchel H, Budts W, Gewillig M. "Effect Of Respiration On Cardiac Filling At Rest And During Exercise In Fontan Patients: A Clinical And Computational Modeling Study." *IJC Heart & Vasculature.* (2015)
22. **Kung E**, Marsden A, Baker C, Giardini A, Figliola R, Hsia TY, "Does TCPC Power Loss Really Affect Exercise Capacity?" *Heart.* DOI:10.1136/heartjnl-2014-307379 (2015)
23. Schiavazzi D, **Kung E**, Marsden AL, Baker C, Pennati G, Hsia TY, Dorfman A, "Hemodynamic Effects of Left Pulmonary Artery Stenosis Following Superior Cavopulmonary Connection: A Patient-Specific Multiscale Modeling Study." *J Thoracic and Cardiovascular Surgery.* (2014)
24. Corsini C, Baker C, Baretta A, Biglino G, Hlavacek AM, Hsia TY, **Kung E**, Marsden A, Migliavacca F, Vignon-Clementel I, Pennati G, "Integration of Clinical Data Collected at Different Times For Virtual Surgery in Single Ventricle Patients: A Case Study." *Annals of Biomedical Engineering.* (2014)
25. **Kung E**, Perry JC, Davis C, Migliavacca F, Pennati G, Giardini A, Hsia TY, Marsden A, "Computational Modeling of Pathophysiologic Responses to Exercise in Fontan Patients." *Annals of Biomedical Engineering.* DOI:10.1007/s10439-014-1131-4 (2014)
26. **Kung E**, Kahn AM, Burns JC, Marsden A, "In-vitro Validation of Patient-Specific Hemodynamic Simulations in Coronary Aneurysms Caused by Kawasaki Disease." *Cardio Eng and Tech.* 5(2):189-201 (2014)
27. Sengupta D, Kahn AM, **Kung E**, Moghadam ME, Shirinsky O, Lyskina GA, Burns JC, Marsden AL, "Thrombotic Risk Stratification Using Computational Modeling in Patients with Coronary Artery Aneurysms Following Kawasaki Disease." *Biomechanics and Modeling in Mechanobiology.* DOI 10.1007/s10237-014-0570-z (2014)
28. **Kung E**, Pennati G, Migliavacca F, Hsia TY, Figliola R, Marsden A, Giardini A, MOCHA Investigators, "A Simulation Protocol For Exercise Physiology In Fontan Patients Using A Closed-Loop Lumped-Parameter Model." *Journal of Biomechanical Engineering.* 136(8):081007 (2014)
29. Lee J, Moghadam ME, **Kung E**, Cao H, Beebe T, Miller Y, Roman BL, Lien C-L, Chi NC, Marsden AL, "Moving Domain Computational Fluid Dynamics to Interface with an Embryonic Model of Cardiac Morphogenesis." *PloS one.* 8(8):e72924 (2013)
30. **Kung E**, Baretta A, Baker C, Arbia G, Biglino G, Corsini C, Schievano S, Vignon-Clementel IE, Dubini G, Pennati G, Taylor A, Dorfman A, Hlavacek AM, Marsden AL, Hsia T-Y, Migliavacca F, "Predictive modeling of the virtual Hemi-Fontan operation for second stage single ventricle palliation: Two patient-specific cases." *Journal of Biomechanics.* 46(2):423-429 (2013)
31. Corsini C, Baker C, **Kung E**, Schievano S, Arbia G, Baretta A, Biglino G, Migliavacca F, Dubini G, Pennati G, Marsden A, Vignon-Clementel I, Taylor A, Hsia TY, Dorfman A, MOCHA Investigators, "An

integrated approach to patient-specific predictive modeling for single ventricle heart palliation.” *Comput Methods Biomech Biomed Engin.* Available online, DOI:10.1080/10255842.2012.758254 (Jan 23, 2013)

32. **Kung E**, Les A, Figueroa CA, Medina F, Arcaute K, Wicker R, McConnell M, Taylor C, “In Vitro Validation of Finite Element Analysis of Blood Flow in Deformable Models.” *Annals of Biomedical Engineering.* 39(7):1947-1960 (2011)
33. **Kung E**, Les AS, Medina F, Wicker RB, McConnell MV, Taylor CA, “In vitro validation of finite-element model of AAA hemodynamics incorporating realistic outlet boundary conditions.” *J Biomech Eng.* 133(4):041003 (2011).
34. **Kung E**, Taylor C, “Development of a Physical Windkessel Module to Re-Create In Vivo Vascular Flow Impedance for In Vitro Experiments.” *Cardiovascular Engineering and Technology.* 2(1):2-14 (2011)

BOOK CHAPTERS

1. Marsden A, **Kung E**, “Multi-scale Modeling of Cardiovascular Flows”, *Computational Bioengineering*, CRC Press Taylor & Francis Group, Editor: Guigen Zhang. Oct 2017. ISBN: 9781138850200
2. **Kung E**, “Cardiovascular Biomechanical Models”, *Advances in Experimental Surgery, Volume 1*, Nova Science Publishers, Editors: Huifang Chen, Paulo N. Martins. Feb 2018. ISBN: 978-1-53612-775-1
3. **Kung E**, Marsden A, “Fontan Surgery and Fluid Dynamics”, *Modelling Congenital Heart Disease: Engineering A Patient-specific Therapy*, Springer Nature, Editors: Gianfranco Butera, Silvia Schievano, Giovanni Biglino, McElhinney Doff B. 2022. ISBN 978-3-030-88892-3

FUNDED RESEARCH

Clemson-MUSC AI Hub *Clemson-MUSC AI Hub Augmentation Seed Grant*, (Co-PI) “Morphologic, Hemodynamic, and Combined Multi-feature Investigation of Stroke Risk in Carotid Stenosis,” 6/1/2023-5/31/2024, \$25,000

National Science Foundation *CAREER Award*, (PI) “Hybrid Experimental-Computational Modeling Framework for Transformative Research and Multidisciplinary Education in Cardiovascular Biomechanics,” 7/1/2018-6/30/2023, \$513,729

National Science Foundation *XSEDE Award*, (Co-PI, PI Justin Tran, TG-PHY200079) “Expanding the SimVascular Supercomputing Gateway for Research,” 1/1/2021-6/30/2022, 1 million HPC compute hours

Health Sciences Center, Prisma Health *COVID-19 Research Grant*, (Co-PI, PI John Desjardins) “Development, Testing and Evaluation the "COVER" Device (Covering for Operations during Viral Emergency Response) in the Emergency Room,” 2020-2020, \$15,128 (Co-PI portion \$3,025)

American Heart Association *Scientist Development Grant*, (PI) “Design of Fontan Cavopulmonary Assist Using A Novel Combined Experimental-Computational Technology,” 2016-2019, \$231,000

Saving tiny Hearts Society *Research Grant*, (PI) “Feasibility of a Novel Fontan Right-Side Assist Device,” 2017-2018, \$65,000

Clemson University *TIGER Grant Award*, (PI) “Trans-catheter Aortic Valve Replacement Treatment Planning via A Novel Virtual Procedure,” 2017-2018, \$18,000

Jarvik Heart, Inc. Research Grant, (PI) “Assessment of the Jarvik 2000 Ventricular Assist Device Using the Physiology-Modeling Coupled Experiment,” 2017-2017, \$6,013

Leducq Foundation Transatlantic Network of Excellence for Cardiovascular Research, (Co-investigator, PI TY Hsia) “Multi-Scale Modeling of Single Ventricle Hearts for Clinical Decision Support,” 2010-2015, \$6M (Co-investigator portion \$33,000 for 2015-2016)

American Heart Association Postdoctoral Fellowship, (PI) “In-vivo Validation of Multi-scale CFD Simulations in Exercise Fontan Circulation,” 2012-2014, \$85,000

FIRST/LAST AUTHORED CONFERENCE PROCEEDINGS

1. Umo A, Welch B, Kilic A, **Kung E**. Clinical Validation of the PSCOPE Hybrid Framework For Cardiovascular Predictive Modeling. Summer Biomechanics, Bioengineering and Biotransport Conference, Lake Geneva, WI, June 11-14, 2024.
2. **Kung E**. Applications of Machine Learning in Cardiovascular Modeling and Benchtop Flow Experiments. Clemson University AI Research Symposium, Clemson, SC, April 26, 2024
3. Umo A, **Kung E**. Advance In Hybrid Cardiovascular Modeling: Coupling Volumetrically Dynamic In-Vitro Experiments To Numerical Physiology Simulation. Summer Biomechanics, Bioengineering and Biotransport Conference, Vail, CO, June 4-8, 2023.
4. Dave R, Luraghi G, Sierad L, Migliavacca F, **Kung E**. Wall shear Stress Quantification in Tissue Engineered Heart Valves. 9th World Congress of Biomechanics, Taipei, Taiwan, July 10-14, 2022. *Podium presentation*
5. Gupta A, Pradhan A, Schmidt T, Sharma S, **Kung E**. Automated Tuning of a Lumped Parameter Model for Simulating Cardiovascular Physiology. 9th World Congress of Biomechanics, Taipei, Taiwan, July 10-14, 2022. *Podium presentation*
6. Umo A, **Kung E**. Method For Coupling Volumetrically Dynamic In Vitro Experiments To Numerical Physiology Simulation For A Hybrid Cardiovascular Model. 9th World Congress of Biomechanics, Taipei, Taiwan, July 10-14, 2022. *Podium presentation*
7. Shah S, Soler Z, **Kung E**. Correlation Between Anosmia and Airflow in the Nasal Cavity. 9th World Congress of Biomechanics, Taipei, Taiwan, July 10-14, 2022.
8. Gupta A, Pradhan A, Sharma S, Schmidt T, **Kung E**. Automated Tuning of a Lumped Parameter Model for Simulating Resting Cardiovascular Physiology. Summer Biomechanics, Bioengineering and Biotransport Conference, Cambridge, MD, June 20-23, 2022. *Podium presentation*
9. Shah S, Soler Z, **Kung E**. Correlation Between Anosmia and Airflow in the Nasal Cavity. Summer Biomechanics, Bioengineering and Biotransport Conference, Cambridge, MD, June 20-23, 2022.
10. Dave R, Luraghi G, Sierad L, Migliavacca F, **Kung E**. Wall Shear Stress Quantification in Tissue Engineered Heart Valves. Society of Engineering Science Annual Conference, Virtual, Oct 1-29, 2021 *Winner: Poster Competition – “Living Matter” Category*
11. Gupta A, Pradhan A, Sharma SP, Schmidt T, **Kung E**. A General Protocol For Simulating Resting Cardiovascular Physiology Using A Closed-Loop Lumped Parameter Model. ASME Summer Biomechanics, Bioengineering and Biotransport Conference, Virtual, June 14-18, 2021

12. Gupta A, Pradhan A, Schmidt T, Sharma SP, **Kung EO**. A General Protocol for Lumped-parameter Model Input Identification To Simulate Resting Cardiovascular Physiology. ASAIO 66th Annual Conference, Washington, DC, June 10-12, 2021
13. Farahmand M, Kavarana M, **Kung E**. Target Operation Criteria for a Fontan Cavopulmonary Mechanical Support Device. BMES Annual Meeting, Philadelphia, PA, Oct 16-19, 2019 *Podium presentation*
14. **Kung E**, Farahmand M, Gupta A. A Hybrid Experimental-Computational Modeling Framework for Cardiovascular Device Testing. ASAIO 65th Annual Conference, San Francisco, CA, June 26–29, 2019
15. Pradhan A, **Kung E**. Systematic Review and Meta-Analysis of the Effect of Age and Body Size on Left Ventricular Volume. BMES/FDA Frontiers in Medical Devices Conference, Washington, DC, March 19-21, 2019
16. Farahmand M, Kavarana M, **Kung E**. Optimal Range of Settings for Fontan Cavopulmonary Pump. BMES Annual Meeting, Atlanta, GA, Oct 17-20, 2018 *Podium presentation*
17. Salek S, Behrle N, Shah S, Divekar A, Farahmand M, **Kung E**. A Patient-Specific In-Vitro Setup for Transcatheter Pulmonary Valve Replacement Outcome Prediction. BMES Annual Meeting, Atlanta, GA, Oct 17-20, 2018
18. **Kung E**, Farahmand M, Gupta A. Unifying Experiment and Computation in Cardiovascular Modelling. 8th World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018
19. Farahmand M, Mirzaei E, Shabani M, Kavarana M, **Kung E**. A Novel Right-Side Assist Device for Univentricular Fontan Patients. 8th World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018 *Podium presentation*
20. Gupta A, **Kung E**. Smart Discretization Through Automated Iterative Adaptive Meshing. 8th World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018
21. Gupta A, **Kung E**. Pulmonary Artery and Somatic Growth in Fontan Patients. 8th World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018
22. Farahmand M, **Kung E**. Modified Cavopulmonary Assist Device Implemented In the Inferior Vena Cava Can Improve Fontan Hemodynamics. ASAIO 64th Annual Conference, Washington, DC, June 13-16, 2018 *Podium presentation*
23. Mirzaei E, **Kung E**. An Algorithm for Coupling Multi-Outlet Experimental Sections to Numerical Physiology Simulations for a Hybrid Cardiovascular Model. ASAIO 64th Annual Conference, Washington, DC, June 13-16, 2018
24. Gupta A, **Kung E**. A Protocol For Automated Adaptive Discretization of Complex Geometry. ASAIO 64th Annual Conference, Washington, DC, June 13-16, 2018
25. Blais F, Luraghi G, Migliavacca F, Pennati G, Sierad L, **Kung E**. 3-Dimensional Fluid-Structure Interaction Computational Model of Heart Valves for Bioreactor Optimization. Biomedical Engineering Society Annual Meeting, Phoenix, AZ, Oct 11-14, 2017 *Podium presentation*
26. Scaringi J, **Kung E**. Multivariate Models For Aortic Pressure And Cardiac Output Constructed From Meta-Analysis. Biomedical Engineering Society Annual Meeting, Phoenix, AZ, Oct 11-14, 2017
27. Neely K, Danahy R, Capobianco P, Shabanisamghabady M, Farahmand M, **Kung E**. Design of an Actuated Pressure Waveform Generating Device for In-Vitro Cardiovascular Experiments. Biomedical Engineering Society Annual Meeting, Phoenix, AZ, Oct 11-14, 2017

28. Shabanisamghabady M, **Kung E**. External Balloon For Fontan Cavo-Pulmonary Assist – In-Vitro Study Of Device Design Considerations. Biomedical Engineering Society Annual Meeting, Phoenix, AZ, Oct 11-14, 2017 *Podium presentation*
29. **Kung E**, Farahmand M, Gupta A. Physiology-Modeling Coupled Experiment: A High Fidelity Hardware-in-the-loop Hybrid Model for the Circulation. Biomedical Engineering Society Annual Meeting, Phoenix, AZ, Oct 11-14, 2017
30. Mirzaei E, Kavarana M, Georgakopoulos D, **Kung E**. A Novel Right-Side Assist Implementation Could Bring Potential Hemodynamic Improvements in Fontan Patients. ASME Summer Biomechanics, Bioengineering and Biotransport Conference, Tucson, AZ, June 21-24, 2017 **Finalist: MS student paper competition.**
31. Gupta A, **Kung E**. Pulmonary Artery and Somatic Growth in Fontan Patients. ASME Summer Biomechanics, Bioengineering and Biotransport Conference, Tucson, AZ, June 21-24, 2017 **Finalist: MS student paper competition.**
32. Farahmand M, **Kung E**. Hemodynamic Effects of Stenosis in the Inferior Vena Cava Conduit and Left Pulmonary Artery of the Fontan Circulation. ASME Summer Biomechanics, Bioengineering and Biotransport Conference, Tucson, AZ, June 21-24, 2017
33. Shabanisamghabady M, Mirzaei E, Kavarana M, Georgakopoulos D, **Kung E**. In-vitro Validation of a Lumped-parameter Model For A Fontan Right-side Assist Device. ASME Summer Biomechanics, Bioengineering and Biotransport Conference, Tucson, AZ, June 21-24, 2017
34. **Kung E**, Farahmand M, Gupta A. Physiology-Modeling Coupled Experiment: A High Fidelity Hardware-in-the-loop Hybrid Model for the Circulation. ASME Summer Biomechanics, Bioengineering and Biotransport Conference, Tucson, AZ, June 21-24, 2017
35. Schmidt T, Rosenthal D, Reinhartz O, Marsden A, **Kung E**, MOCHA Investigators. Evaluation of Pulsatile and Continuous Flow Ventricular Assist Device Implementation in the Single-Ventricle Circulation: A Lumped-Parameter Modeling Study. Summer Biomechanics, Bioengineering and Biotransport Conference, National Harbor, MD, June 29-July 2, 2016
36. Mechoor R, Schmidt T, **Kung E**. A Real-Time Programmable Pulsatile Flow Pump For In-Vitro Cardiovascular Experimentation. Summer Biomechanics, Bioengineering and Biotransport Conference, National Harbor, MD, June 29-July 2, 2016
37. Kavarana M, Georgakopoulos D, **Kung E**. Pediatric Mechanical Circulatory Support Device: The Fontan-Booster. ASAIO 62nd Annual Conference, San Francisco, CA, June 15-18, 2016
38. Schmidt T, Rosenthal D, Reinhartz O, Marsden A, **Kung E**, MOCHA Investigators. Computational Evaluation of Ventricular Assist Implementation in Single-Ventricle Circulation. BMES/FDA Frontiers in Medical Devices Conference, College Park, MD, May 23-25 2016
39. **Kung E**. Computational and Experimental Engineering Approach to Cardiovascular Medicine. Clemson Research Symposium: Building a Culture of Transdisciplinary Research, Clemson, SC, May 4 2016 *Podium presentation*
40. **Kung E**, De Bruaene A, Claessen G, Gerche A, Marsden A, Meester P, Devroe S, Bogaert J, Claus P, Heidbuchel H, Budts W, Gewillig M. Respiration Increases Ventricular Filling At Rest And Exercise Via Pulmonary Compliance: A Clinical And Computational Modeling Study. American Heart Association Scientific Sessions, Orlando, FL, Nov 7-11 2015 *Podium presentation.*

41. **Kung E.** Integration of Computational and Benchtop Experimental Engineering Methods in Cardiovascular Medicine. Clemson 2nd Annual Research Symposium, Clemson, SC, Mar 12 2015
Podium presentation
42. **Kung E,** Giardini A, Hsia TY, Marsden A, MOCHA Investigators. Realistic Simulation of Exercise Physiology in Fontan Patients. Congenital Heart Surgeons' Society Annual Meeting, Chicago, IL, Oct 19-20 2014
43. **Kung E,** Kahn AM, Burns JC, Marsden A. In-vitro Validation of Patient-Specific Hemodynamic Simulations in Coronary Aneurysms Caused by Kawasaki Disease. 7th World Congress of Biomechanics, Boston, MA, July 6-11 2014
44. **Kung E,** Pennati G, Migliavacca F, Hsia TY, Marsden A, Giardini A, MOCHA Investigators. A Simulation Protocol For Exercise Physiology In Fontan Patients Using A Closed-Loop Lumped-Parameter Model. 7th World Congress of Biomechanics, Boston, MA, July 6-11 2014
45. **Kung E,** Perry J, Davis C, Hsia TY, Marsden A, MOCHA Investigators. Computational Modeling of Pathophysiologic Responses to Exercise in Fontan Patients. 4th International Conference on Engineering Frontiers in Pediatric and Congenital Heart Disease, Paris, France, May 21–22 2014
46. **Kung E,** Pennati G, Migliavacca F, Hsia TY, Figliola R, Marsden A, Giardini A, MOCHA Investigators. A Simulation Protocol For Exercise Physiology In Fontan Patients Using A Closed-Loop Lumped-Parameter Model. The 8th Southern California Symposium on Flow Physics, Los Angeles, CA, Apr 12 2014 *Podium presentation.*
47. **Kung E,** Giardini A, Migliavacca F, Pennati G, Hsia TY, Marsden A. An Automated Simulation Protocol For Exercise Physiology In Fontan Patients Using A Closed-Loop Lumped-Parameter Model. ASME Summer Bioengineering Conference, Sunriver, OR, June 26-29 2013 *Podium presentation.*
48. **Kung E,** Giardini A, Migliavacca F, Pennati G, Hsia TY, Marsden A. An Automated Simulation Protocol For Exercise Physiology In Fontan Patients Using A Closed-Loop Lumped-Parameter Model. 14th UC Systemwide Bioengineering Symposium, San Diego, CA, June 19-21 2013 *Podium presentation.*
49. **Kung E,** Baker C, Corsini C, Baretta A, Schievano S, Arbia G, Vignon-Clementel I, Migliavacca F, Pennati G, Dorfman A, Hlavacek A, Hsia TY, Marsden A. Patient-specific Multi-scale Model and Virtual Surgery of the Superior Cavopulmonary Connection. The seventh Southern California Symposium on Flow Physics, Pasadena, CA, Apr 13 2013 *Podium presentation.*
50. **Kung E,** Marsden A. Multi-scale Simulation and Surgical Optimization for Congenital Heart Disease Patients. SIAM Conference on Computational Science and Engineering, Boston, MA, Feb 25-Mar 1, 2013 *Podium presentation.*
51. **Kung E,** Baker C, Corsini C, Baretta A, Schievano S, Arbia G, Vignon-Clementel I, Migliavacca F, Pennati G, Dorfman A, Hlavacek A, Marsden A, Hsia TY. Patient-specific Multi-scale Model and Virtual Surgery of the Superior Cavopulmonary Connection. Conference on Engineering Frontiers in Pediatric and Congenital Heart Disease, Stanford, CA, United States, May 1-2 2012
52. **Kung E,** Les A, Medina F, Wicker R, McConnell M, Taylor CA. In Vitro Validation of Finite Element Model of AAA Hemodynamics Incorporating Realistic Outflow Boundary Conditions. BioMechanical Engineering Conference at Stanford, Stanford, CA, United States, May 24th 2010
53. **Kung E,** Les A, Medina F, Wicker R, McConnell M, Taylor CA. In Vitro Validation of Finite Element Model of AAA Hemodynamics Incorporating Realistic Outflow Boundary Conditions. ASME 2010 Summer Bioengineering Conference, Naples, FL, United States, June 16-19 2010 *Podium presentation.*

1st Place Winner: PhD Student Paper Competition Podium Presentation - Biofluids and Biotransport Engineering & Other Category

INVITED TALKS

1. "In-Vitro Experimentation, Computational Modeling, and Data Science: A Dynamic Trio for Innovating Cardiovascular Medical Technologies & Patient Management", Global Data Science & Analytics Speaker Series, **Abbott Laboratories**, June 25, 2024
2. "Applications of AI in Experimental and Computational Cardiovascular Biomechanics Research", ENG-STE CED-Computational Engineering Seminar, **Lawrence Livermore National Laboratory**, Dec 20, 2023
3. "Biofluid Dynamics", Computer Modeling for Medical Device Design in Organs and Tissues, **3rd IEEE Engineering in Medicine and Biology Society International Summer School on Computer Modeling in Medicine**, June 18-23, 2023
4. "Fontan VADs: Engineer's perspective", Pediatric Medical Device Day Course, **ASAIO Annual Conference**, June 10, 2020 (*postponed*)
5. "Incentivizing Participation in Highly Technical Classes", Teaching Symposium: Communication, Technology, & Research, **Clemson University**, Dec 17, 2019
6. "Tissue and Organ Scale Cardiovascular Modelling Across Fidelities and Modalities", Vascular Biomechanics in Development and Disease Symposium, **Society of Engineering Science Annual Technical Meeting**, October 13-15, 2019
7. "Cardiovascular Biomechanics Modeling and Experimentation", Biophysics Seminar, **Clemson University**, Oct 25, 2018
8. "Computational Modelling of the Fontan Circulation", Friday Keynote Lecture, **Universitaire ziekenhuizen Leuven**, June 29, 2018
9. "Three Emerging Engineering Tools that Can Benefit Cardiovascular Healthcare", Seminar, **Murdoch Childrens Research Institute**, Dec 16 2016
10. "Clinical Applications of Novel Engineering Tools in Cardiovascular Biomechanics", Biomedical Engineering Seminar, **University of South Carolina**, Sep 9 2016
11. "Application of Computational and Experimental Engineering Tools to Cardiovascular Medicine", MUSC Children's Hospital Medical Conference, **Medical University of South Carolina**, Nov 12 2015
12. "Integration of Computational and Benchtop Experimental Engineering Methods in Cardiovascular Medicine", Cardiovascular Institute Seminar, **Weill Cornell Medical College**, June 26 2014
13. "Integration of Computational and Benchtop Experimental Engineering Methods in Cardiovascular Medicine", Cardiovascular Institute Seminar, **Weill Cornell Medical College**, May 30 2014
14. "Integration of Computational and Benchtop Experimental Engineering Methods in Cardiovascular Medicine", Mechanical Engineering Seminar, **Clemson University**, May 4 2014
15. "In-Vitro Experimental Validation of Finite Element Analysis of Blood Flow and Vessel Wall Dynamics," MAE Dept Biomechanics Seminar, **University of California San Diego**, Jan 5 2011
16. "Product Development, Design, and Manufacturing for the Deep Bleeder Acoustic Coagulation Project," **C8 MediSensors Inc.** (Los Gatos, CA), Oct 28 2010

17. “In-Vitro Experimental Validation of Finite Element Analysis of Blood Flow and Vessel Wall Dynamics,” **Triple Ring Technologies** (Newark, CA), Sep 9 2010
18. “Product Development, Design, and Manufacturing for the Deep Bleeder Acoustic Coagulation Project,” **Design-Revolution** (Palo Alto, CA), Aug 24 2010

TEACHING

Instructor, Cardiovascular Biomechanics, Bioengineering / Mechanical Engineering, Clemson University, F15 – Current

Instructor, Foundations of Thermal and Fluid systems (ME2030), Dept. of Mechanical Engineering, Clemson University, S22 – Current

Joint Instructor, Medical Biophysics Core 2: Tissue/Organs (MBIO 8110), Medical Biophysics, Clemson University, F22 – Current

Instructor, Fluid Mechanics (ME3080), Dept. of Mechanical Engineering, Clemson University, S15 – F21

Instructor, Cardiovascular Biomechanics and Modeling, Globex Julmester Program, Peking University, Summer 2019

Advisory Committee, Internship in Engineering Design (ME4020): Dept. of Mechanical Engineering, Clemson University

Flour Corp CIP Module, S24

CMC Steel Hook Paint Removal, S24

Solvay Processing Tow Dividing Tool, S23

Clemson Hydrodynamic Water Tunnel, S20

ABB IP5x Bearing Test Stand, S20

Sound-Emitting System Design for Club Car Low-Speed Vehicles, S19

Turbine Blade Lift Fixture Design, F16

Automated Guided Vehicle, F14/S15 (In the News: Fox Carolina, WSPA, WYFF4 News, Clemson Newsstand, GSA Business, Greenville News.)

Guest Lecturer, Cardiovascular Fluid Mechanics (MAE261), Dept. of Mechanical and Aerospace Engineering, University of California San Diego, Feb 8 2013

Guest Lecturer, Computational Methods for Engineers (MAE107), Dept. of Mechanical and Aerospace Engineering, University of California San Diego, 2011

Teaching Assistant, Molecular and Cellular Bioengineering (BIOE 200A), Dept. of Bioengineering, Stanford University, Fall 2005/2006

Teaching Assistant, Cardiovascular Bioengineering (ME/BIOE 284A/B), Dept. of Bioengineering/Mechanical Engineering, Stanford University, Fall & Winter 2007-2009

Teaching Assistant, Systems Biology and Tissue Engineering (BIOE 300B), Dept. of Bioengineering, Stanford University, Spring 2007/2008

EXTERNAL SERVICE ACTIVITIES

Grant Reviewer

- National Science Foundation – 2018, 2020
- American Heart Association – 2016, 2017, 2018, 2021, 2022, 2023
- National Sciences and Engineering Research Council of Canada – 2016
- UK Medical Research Council – 2015, 2016
- National Institute of Health – 2020, 2023
- Lawrence Livermore National Laboratory: Computing Grand Challenge — 2023

Professional Service

- Summer Biomechanics, Bioengineering and Biotransport Conference, Santa Ana Pueblo, NM, 2025 – Exhibit Chair, Executive Committee
- Summer Biomechanics, Bioengineering and Biotransport Conference, Lake Geneva, WI, 2024 – Coordinator, Translational Technology Pitch Competition and Networking Event
- Summer Biomechanics, Bioengineering and Biotransport Conference, Lake Geneva, WI, 2024 – Coordinator, “Transitioning Between Academia and Industry” workshop
- Summer Biomechanics, Bioengineering and Biotransport Conference, Lake Geneva, WI, 2024 – Judge, PhD Student Paper Competition Biofluids and Biotransport Category
- Summer Biomechanics, Bioengineering and Biotransport Conference, Vail, CO, 2023 – Organizer, Translational Technology Pitch Competition and Networking Event
- Summer Biomechanics, Bioengineering and Biotransport Conference, Vail, CO, 2023 – Organizer, special session “Translational Bioengineering”
- Summer Biomechanics, Bioengineering and Biotransport Conference, Vail, CO, 2023 – Session Chair, "Cardiovascular Devices and Design"
- 9th World Congress of Biomechanics, Taipei, Taiwan ROC, 2022 – Session organizer and chair, “Cardiovascular Modeling and Experimentation”
- ASME Summer Biomechanics, Bioengineering and Biotransport Conference, Cambridge, MD, 2022 – Verification, Validation, and Uncertainty Quantification workshop organizer
- ASME Summer Biomechanics, Bioengineering and Biotransport Conference, Virtual, 2021 – Career Connection event organizer
- ASME Summer Biomechanics, Bioengineering and Biotransport Conference, Virtual, 2020 – Career Connection event organizer
- ASME Summer Biomechanics, Bioengineering and Biotransport Conference, Seven Springs, PA, 2019 – Career Connection event organizer
- BMES Annual Meeting, Philadelphia, PA, 2019 – Session chair, "Biofluid Mechanics"
- BMES Annual Meeting, Philadelphia, PA, 2019 – Abstract reviewer, “Biomechanics” and “Translational” tracks
- BMES/FDA Frontiers in Medical Devices Conference, Washington DC, 2019 – Track chair, “Real World Data as Model Input”
- BMES Annual Meeting, Atlanta, GA, 2018 – Session chair, "Interventional Devices and Robotics"
- 8th World Congress of Biomechanics, Dublin, Ireland, 2018 – Session organizer and chair, “Technological Innovation in Medical Devices”
- ASME Summer Biomechanics, Bioengineering and Biotransport Conference, Tucson, AZ, 2017 – Industry luncheon organizer
- ASME Summer Biomechanics, Bioengineering and Biotransport Conference, National Harbor, 2016 – Session chair, "Pediatric Cardiology and Embryology"
- American Physical Society Division of Fluid Dynamics, San Diego, 2012 – Abstract reviewer

Journal Reviewer

- American Journal of Physiology Heart and Circulatory
- American Society for Artificial Internal Organs Journal
- Annals of Biomedical Engineering
- Artificial Organs
- Applied Sciences
- ASME Journal of Engineering and Science in Medical Diagnostics and Therapy
- Bioengineering
- Biomechanics and Modeling in Mechanobiology
- Cardiology in the Young

- Cardiovascular Engineering and Technology
- Cardiovascular Translational Research
- Computers in Biology and Medicine
- Computer Methods and Programs in Biomedicine
- Current Cardiology Reviews
- Frontiers Pediatrics
- Frontiers Physiology
- Heliyon
- IEEE Transactions on Biomedical Engineering
- International Journal for Numerical Methods in Biomedical Engineering
- Journal of the American College of Cardiology: Advances
- Journal of Biomechanical Engineering
- Journal of Biomechanics
- Journal of Clinical Medicine
- Journal of Engineering in Medicine
- Journal of Medical and Biological Engineering
- Journal of Mechanical Science and Technology
- Journal of the Royal Society Interface
- Mathematical Biosciences and Engineering
- Medical Engineering & Physics
- PLOS Computational Biology
- Proceedings of the Institution of Mechanical Engineers, J Engineering in Medicine
- Progress in Pediatric Cardiology
- Physics of Fluids
- Science Translational Medicine
- Scientific Reports
- World Journal for Pediatric and Congenital Heart Surgery

Professional memberships American Society of Mechanical Engineers, American Heart Association, American Society for Artificial Internal Organs, Biomedical Engineering Society

Educational Outreach

Summer 2023 Instructor, Mechanical Engineering 1-week course, Clemson University Summer Scholars
 Summer 2023 Mentor, Clemson EUREKA summer program (1 mentee)
 2022-2023 Dixon Senior Fellow, Clemson University Honors College
 6/20/2022 Mentor, Diversity Mentor-Mentee Event, SB3C Conference, Eastern Shore, MD
 Summer 2022 Instructor, Mechanical Engineering 1-week course, Clemson University Summer Scholars
 Summer 2022 Mentor, Clemson EUREKA summer program (3 mentees)
 2021-2022 Dixon Senior Fellow, Clemson University Honors College
 2021-2022 Faculty advisor, Clemson Pi Tau Sigma
 Jan 2022 Instructor, Mechanical Engineering 2-week virtual course for GS Highschool in Korea, Clemson University Summer Scholars
 11/3/2021 Guest speaker, Faculty Commons Guatemala Coffee Break
 10/26/2021 Guest speaker, Clemson Ratio Christi
 6/16/2021 Judge, SB3C Conference, BS Student Poster Competition
 Summer 2021 Instructor, Mechanical Engineering 1-week course, Clemson University Summer Scholars
 Summer 2021 Mentor, Clemson EUREKA summer program (3 mentees)
 Summer 2021 Mentor, South Carolina Governor's School for Science and Mathematics (4 mentees)
 Summer 2021 Mentor, Summer Creative Inquiry & Undergraduate Research Program (1 mentee)
 Dec 2020 Judge, SIMIODE Challenge Using Differential Equations Modeling worldwide competition
 Summer 2020 Instructor, Mechanical Engineering 1-week course, Clemson University Summer Scholars
 Summer 2020 Mentor, Clemson EUREKA summer program (5 mentees)
 Summer 2020 Mentor, COVID Challenge summer research program (6 mentees)
 2/27/2020 Tech demo, ONE Seneca STEAM Night
 10/24/2019 Host: Lab tour for Bioinspired Honors Seminars HON1940 (Instructor: Charles Beard)
 Summer 2019 Mentor, Summer Creative Inquiry & Undergraduate Research Program (1 mentee)

2/21/2019 Tech demo, ONE Seneca STEAM Night
 12/7/2018 Host: Lab tour for elementary school students, Clemson Engineering Design Expo
 11/2/2018 Judge: Three Minute Thesis Competition, Clemson University
 10/26/2018 Judge: Three Minute Thesis Competition, Clemson University
 2018-2019 Clemson Faculty Friends: Mentor for freshmen residence floor Core A2
 10/5/2018 Host: Lab tour for minority students in the STEM All IN program visit
 Summer 2018 Mentor, Clemson EUREKA summer program (2 mentees)
 3/27/2018 Tech demo, ONE Seneca STEAM Event
 Summer 2017 Mentor, Clemson EUREKA summer program (4 mentees)
 5/12~14, 2017 Engineering toys showcase, Artisphere Festival, Clemson STEAM Exhibit
 3/15/2017 Host: Lab tour for under-represented students from Morehouse College
 2/9/2017 DrawBot demonstration, ONE Seneca Family STEAM Night
 2015-2017 Faculty advisor, Clemson Ratio Christi
 12/2/2016 Host: Lab tour for elementary school students, "*Clemson Engineering Design Expo*"
 Summer 2016 Mentor, Clemson EUREKA summer program (2 mentees)
 6/30/2016 Mentor, Career Networking Mixer, ASME SB3C Meeting
 5/13~15, 2016 Spin disc musical instrument showcase, Artisphere Festival, Clemson STEAM Exhibit
 1/28/2016 DrawBot demonstration, Seneca STEAM Outreach Night
 8/16/2015 Faculty volunteer: Clemson Out-of-State-Connection Orientation Outreach
 7/16/2015 DrawBot demonstration, Rotary Club Clemson
 Summer 2015 Mentor, Clemson EUREKA summer program (3 mentees)
 5/8~11, 2015 DrawBot demonstration, Artisphere Festival, Clemson STEAM Exhibit
 3/19/2015 Community Judge: National high school level debate tournament
 11/20/2014 Organizer: Clemson Capstone Design Showcase "Automated Guided Vehicle"
 10/8/2014 Faculty Judge: Clemson 3rd Mechanical Engineering Poster Competition
 3/14/2014 Table Host: La Jolla Elementary School Family Science Night "*CompSci & Engineering*"
 1/31/2014 Teacher/Activity leader: San Diego Festival of Science and Engineering
Nifty 50 Program Led Outreach Activities 2014
 9/21/2013 Teacher/Activity leader: Center for Talented Youth, Family Academic Programs
Science and Technology Series @ UCSD
 7/26/2012 Guest lecturer: UCSD Academic Connections *Class: Fluid Mechanics*
 7/25/2012 Host: Lab tour for minority undergraduate student group
 2/28/2012 Host: Lab tour for high school visiting group
 1/21/2012 Host/Teacher: Lesson on cardiovascular physiology for high school visiting group
 Fall 2010 Instructor: Stanford "Splash!" Educational Studies Program
Classes: Catching Wildlife, Exploring Christian Apologetics, Parkour Free Running