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Research Interests

- Cardiovascular Imaging
- Artificial Intelligence in Medical Imaging
- Heart Valve Engineering
- Technologies for Minimally Invasive Procedures
- Cardiac Support Devices
- Regenerative Medicine & Mitochondrial Engineering

Education

- Ph.D. (Bioengineering), *California Institute of Technology (Caltech), Pasadena, California* – defended on November 1, 2006. Thesis title: The role of vortex ring formation and pressure drop on dynamics of the left ventricle during diastole. Academic advisor: Prof. Mory (Morteza) Gharib.

- M.D., *Tehran University of Medical Sciences, Tehran, Iran* – degree received on August 22, 2000. Thesis title: Measurement of the astigmatic changes after Frown small incision cataract surgery. Thesis advisor: Prof. Mahmoud Jabbarvand.

Professional Employment

University of California, Irvine *10/2010-Present*

- 07/2017 – present: Professor of Biomedical Engineering
- 07/2022 – present: Professor of Computer Science (Joint)
- 07/2017 – present: Professor of Medicine (Cardiology) (Joint)
- 07/2017 – present: Professor of Mechanical and Aerospace Engineering (Joint)
- 07/2023 – present: Professor of Electrical Engineering and Computer Science (Joint)
- 07/2013 – 06/2017: Associate Professor of Biomedical Engineering (Tenured)
- 07/2013 – 06/2017: Associate Professor of Mechanical & Aerospace Engineering (Joint)
- 07/2011 – 06/2013: Assistant Professor of Mechanical & Aerospace Engineering (Joint)
- 10/2010 – 06/2013: Assistant Professor of Biomedical Engineering

University of South Carolina, Columbia, South Carolina *10/2007-10/2010*

- 10/2007 – 10/2010: Assistant Professor of Mechanical Engineering, Medicine, and Cell Biology & Anatomy

California Institute of Technology, Pasadena, California *03/2002-10/2007*

- 01/2007 – 10/2007: Postdoctoral Scholar, Cardiovascular and Biofluid Dynamics Laboratory (Mentor: Prof. Mory Gharib)
- 03/2002 – 11//2006: Graduate research assistant, Cardiovascular and Biofluid Dynamics Laboratory

Tehran University of Medical Sciences, Tehran, Iran *02/1993-03/2002*

- 01/2000 - 03/2002: Research Fellow: Immunogenetics Laboratory, Department of Immunology (Mentor: Prof. Behrouz Nikbin)
- 02/1993 – 08/2000: Medical Student

Honors and Awards

- Fellow, American Society of Echocardiography (FASE) 12/2023-Present
- Fellow, American Institute of Medical and Biological Engineering (AIMBE) 02/2021-Present
- Fulbright-Saastamoinen Foundation Distinguished Chair in Health Sciences 12/2019- Present
- Fellow, American Heart Association (FAHA)
    - Council on Cardiovascular Radiology and Intervention (CVRI) 07/2013- Present

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- Council on Cardiovascular Surgery and Anesthesia (CVSA) 07/2013- Present
- Beall Applied Innovation's inaugural Faculty Innovation Fellow 12/2019- Present
- First place Catalyst award 12/2018
- Second place Catalyst award 12/2017
- Visiting Professor, University Hospital Hamburg Eppendorf, Hamburg, Germany 07/2018-09/2019
- Visiting Professor, University Hospital Schleswig-Holstein, Kiel, Germany 06/2017- 06/2018
- Recipient of Humboldt Research Fellowship for Experienced Researchers from the Alexander von Humboldt Foundation (11/2016)
- News release from Society of Thoracic Surgeons on development of the first Hybrid Tissue-Engineered Heart Valve Technology (June 01, 2015).
- Elected member, Lillehei Heart Institute, University of Minnesota (10/2012- Present).
- News coverage at the American Heart Association's 2013 scientific session on our hybrid self-regenerating heart valve.
- 2013 CVSA (Cardiovascular Surgery and Anesthesia) Travel Award for AHA Scientific Sessions, Dallas, TX
- My business plan entitled "HValve: The First Self-Regenerative Hybrid Heart Valve" was selected as third (among 85 submitted) for presentation in the ASAIO New Venture Forum (2013) in Chicago June 14, 2013.
- C. Walton Lillehei Award Finalist, nominated by The Society of Heart Valve Disease at the 7th Biennial Congress 2013, in Venice, Italy.
- Endorsed by *Royal Academy of Engineering* as an "exceptional promise" (person with potential to be a world leader in Medical Devices and Medical Imaging). This endorsement provided a Tier-1 exceptional talent UK visa to unrestrictedly work in UK institutions for the next three years starting on July 1, 2012.
- Honorary Research Fellow, Royal Brompton Hospital, London, UK July 2012- July 2015
- Honorary Research Associate, California Institute of Technology July 2011- present
- Vivien Thomas Young Investigator Award Finalist nominated by American Heart Association at the AHA Scientific Sessions 2009 in Orlando, Florida.
- The heart-valve model I made based on Leonardo's manuscript, represents the "first scientific flow visualization of impulsive vortex formation" was featured in the exhibit: Leonardo da Vinci: Experience, Experiment and Design, at the *Victoria and Albert Museum* in London (09/14/06 – 01/07/07).
- Finalist for the 2010 Outstanding Freshman Advocate Award from University of South Carolina.
- Honored with a "Two Thumbs Up" Award for making a difference in the education of a student with a disability sponsored by the Delta Alpha Pi, University of South Carolina, 2010.
- My business plan: "Dynamitral: The Only Dynamic Mitral Valve Bioprosthesis" was selected as the 1st (among 85 submitted) for presentation in the ASAIO New Venture Forum (2010) in Baltimore May 29, 2010.
- *Benjamin M Rosen Graduate Fellowship* for graduate study toward the Doctor of Philosophy degree in Bioengineering/Engineering science at Caltech
- Awarded the *first prize* of the 6th National Iranian Student's Book Competition for the best medical translation for the book Cellular and Molecular Immunology (2000).

Invited Speaker

S103. **Heart Center Hamburg, Universitätsklinikum Hamburg-Eppendorf**, Hamburg, Germany (December 16th, 2024)
S102. **CSI Focus D-HF**, Frankfurt, Germany (December 13th, 2024)
S101. **12th Annual Symposium on Pediatric Device Innovation**, co-located with the MedTech Conference, Toronto, ON, Canada (October 14, 2024)
S100. **OCTANE's Cardiovascular Tech Summit**, Vea Hotel, Newport Beach, CA (September 13th, 2024)
S91. **Department of Radiological Sciences**, UC Irvine, Irvine, CA (September 3rd, 2024).
S90. **Congenital Heart Disease in the Adult (ACHD) Annual Conference**, Skamania Lodge, Stevenson, WA (May 29, 2024).

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S89. **The Humboldt Colloquium**, San Fransisco, CA (March 1st, 2024).
S88. **Heart Valve Society Annual Meeting**, Boston, MA (February 20th, 2024).
S87. **Heart Center Hamburg, Universitätsklinikum Hamburg-Eppendorf**, Hamburg, Germany (December 11th, 2023)
S86. **CSI Focus D-HF**, (keynote speaker) Dorint Pallas Wiesbaden, Germany (December 8th, 2023)
S85. **School of Engineering - Sapienza University of Rome**, Italy (March 27th, 2023)
S84. **Fondazione Ri.MED**, Palermo, Italy (March 22nd, 2023)
S83. **National Science Foundation**, EFRI Topic Suggestion Presentation, Arlington, VA (January 20th, 2023).
S82. **Heart Center Hamburg, Universitätsklinikum Hamburg-Eppendorf**, Hamburg, Germany (December 12th, 2022)
S81. **CSI Focus D-HF**, Frankfurt, Germany (December 9th, 2022)
S80. **NIH 2022 Proof of Concept Annual Meeting**, Transitions to Small Business Development Panel, (December 6th, 2022)
S79. **Annual Southern California AI and Biomedicine Symposium**, Irvine, CA (October 14th, 2022)
S78. **OCTANE's Cardiovascular Tech Summit**, Vea Hotel, Newport Beach, CA (October 13th, 2022)
S77. **University of Texas Arlington**, Department of Biomedical Engineering (September 2nd, 2022)
S76. **Instituto Politécnico Nacional**, Mexico City, Mexico (April 29th, 2022)
S75. **Harvard community @Clubhouse** (02/12/2022)
S74. **Medtronic**, Implant Group (October 20th, 2021)
S73. **e-Seminar Series on Translational Biomedical Engineering**, Montreal TransMedTech Institute, Canada (October 6th, 2021).
S72. **Advances of Mitochondria as a Therapeutic Agent Symposium**, Universidad San Francisco de Quito, Ecuador (September 4th, 2021)
S71. **University of Southern California**, Department of Biomedical Engineering (April 12th, 2021)
S70. **Masimo Corporation**, Irvine, CA (April 2nd, 2021)
S69. **Edwards Lifesciences**' Corporate Strategy team retreat, Laguna Beach, CA (January 22nd, 2020)
S68. **Johns Hopkins University**, Department of Mechanical Engineering, Baltimore, MD (October 25th, 2019)
S67. **Southern California Biomedical Imaging & Machine Learning Symposium** (October 04th,2019)
S66. **Universitätsklinikum Hamburg-Eppendorf**, Hamburg, Germany (July 10, 2019)
S65. **Oregon Health and Science University**, Department of Biomedical Engineering, Portland, OR (May 17, 2019)
S64. **3rd Annual Harriet & Jerry Dempsey Research Conference**, Clemson, SC (February 22nd, 2019)
S63. **66th Scientific Session, Japanese College of Cardiology**, Osaka, Japan (September 7th to 9th, 2018)
S62. **Universitätsklinikum Hamburg-Eppendorf**, Hamburg, Germany (August 22, 2018)
S61. **Xeltis AG**, Zurich, Switzerland (July 04, 2018).
S60. **Transcatheter Valve Therapies (TVT)**, Sheraton Grand, Chicago, IL (June 22, 2018)
S59. **Katholieke Universiteit Leuven,** Department of Cardiovascular Sciences, Leuven, Belgium (June 18, 2018).
S58. **The joint EuroCMR/SCMR Meeting**, Barcelona, Spain (February 3rd, 2018)
S57. **Universitätsklinikum Schleswig-Holstein**, Kiel, Germany (August 16, 2017)
S56. **Children Hospital of Los Angeles**, Los Angeles, CA (May 17, 2017)
S55. **Children Hospital of Orange County**, Orange, CA (May 8, 2017
S54. **University of Southern California,** Los Angeles, CA (March 29, 2017).
S53. **American College of Cardiology, 66th Annual Scientific Sessions**, Washington, DC (March 18, 2017)
S52. **American Heart Association's annual Scientific Sessions conference**, New Orleans, LA (Nov 15, 2016)
S51. **Society of Engineering Science 53rd Annual Technical Meeting**, College Park, MD (October 3rd, 2016)
S50. **Medical Design & Manufacturing (MD&M) Minneapolis**, Minneapolis, MN (September 21, 2016)
S49. **University of Toronto**, Department of Mechanical & Industrial Engineering (June 23, 2016)
S48. **American Society of Echocardiography Scientific Sessions**, Seattle, WA (June 10-14, 2016)
S47. **University of Minnesota Design of Medical Devices Conference**, Minneapolis, MN (04/13/2016)
S46. **Western Institute of Nursing 59th Annual Communication Research Conference**, Anaheim, CA (04/07/2016)

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S45. **Heart Valve Society 2016 Annual Scientific Meeting**, Marriott Marquis ▪ New York, NY (03/19/2016).
S44. **University of California, Los Angeles**, Cardiovascular Research Initiative, David Geffen School of Medicine (10/21/2015)
S43. **Tsukuba Global Science Week**, University of Tsukuba, Tsukuba, Japan (09/29/2015)
S42. **CSI 2015**, Catheter Interventions in Congenital, Structural and Valvular Heart Disease, Frankfurt, Germany (06/25/2015)
S41. **American Society of Echocardiography Scientific Sessions**, Boston, MA (June 12-16, 2015)
S40. **Cardiovascular Institute, Stanford University**, Cardiovascular Tissue Engineering Symposium (05/22/2015)
S39. **University of California, Riverside**, Department of Bioengineering (04/15/2015)
S38. **Center for Complex Biological Systems Retreat**, Omni Hotel Los Angeles (03/28/2015)
S37. **California Institute of Technology**, Department of Medical Engineering (01/22/2015)
S36. **Edwards Lifesciences Corporation** (06/10/2014))
S35. **GE Vingmed Ultrasound, Horten, Norway** (08/16/2013)
S34. **University of Florence, Florence, Italy**, Interdepartmental Research Unit BioFlow (06/26/2013).
S33. **University of California, Riverside**, Department of Mechanical Engineering (05/31/2013)
S32. **University of California, Irvine**, Department of Radiological Sciences (04/10/2013)
S31. **Northwestern University**, Department of Radiology (03/06/2013)
S30. **University of California Los Angeles**, Department of Mechanical and Aerospace Engineering (02/13/2013)
S29. **Institut Químic de Sarrià-Universitat Ramon Llull**, Bioengineering Group, Barcelona, Spain (09/21/2012).
S28. **Royal Brompton Hospital**, Cardiac MR Unit, London, UK (09/13/2012)
S27. **Endocardiovascular Biomechanics Research International Symposium**, Marseille France (05/03/2012)
S26. **University of Houston,** Departments of Mathematics and Biomedical Engineering (03/29/2012)
S25. **University Hospital Schleswig-Holstein, Kiel, Germany,** Department of Pediatric Cardiology (12/05/2011)
S24. **San Diego State University,** Department of Aerospace Engineering & Engineering Mechanics (10/14/2011)
S23. **Politecnico di Milano, Milan, Italy,** Department of Structural Engineering, (06/30/2011)
S22. **Cardiff University, Cardiff, UK,** Wales Heart Research Institute (06/22/2011)
S21. **University of California, Irvine,** Division of Cardiology (03/24/2011)
S20. **University of California, Irvine,** Department of Mechanical & Aerospace Engineering (03/11/2011)
S19. **2nd Annual Carolina Cardiovascular COBRE Conference,** USC School of Medicine (11/05/2010)
S18. **6th World Congress on Biomechanics:** Symposium on Innovative Experimental Techniques to Assess Prosthetic Heart Valve Structure-Function Performance, Singapore, August 1-5, 2010.
S17. **University of California, Irvine,** Department of Biomedical Engineering (04/13/2010)
S16. **Vanderbilt University,** Department of Biomedical Engineering (03/17/2010)
S15. **Fondation Leducq,** Mitral Network Autumn Meeting in Charleston, SC on November 12-13, 2009.
S14. **Medical University of South Carolina,** Department of Cell Biology and Anatomy (11/05/2008)
S13. **Carolina Cardiovascular COBRE Conference,** USC School of Medicine (10/16/2008)
S12. **Arizona State University,** Department of Mechanical & Aerospace Engineering (11/02/2007)
S11. **Rice University,** Department of Bioengineering (3/21/2007)
S10. **University of Michigan,** Department of Biomedical Engineering (3/15/2007)
S09. **University of California, San Diego,** Department of Mechanical & Aerospace Engineering (2/28/2007)
S08. **University of Connecticut,** Department of Biomedical Engineering (2/19/2007)
S07. **Virginia Tech,** Department of Engineering Science and Mechanics (2/12/2007)
S06. **University of Chicago,** Department of Surgery, Section of Cardiothoracic Surgery (12/11/2006)
S05. **University of California, San Francisco,** Department of Surgery (07/06/2006)
S04. **Illinois Institute of Technology,** Department of Biomedical Engineering (06/27/2006)
S03. **University of Minnesota,** Department of Biomedical Engineering (04/10/2006)
S02. **University of South Carolina,** Department of Mechanical Engineering (04/03/2006)
S01. **ASAIO 51st Annual Conference** scientific session, invited moderator (06/11/2005)

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Refereed Journal Publications

J75. Okur MN, Ratajczak A, **Kheradvar A**, Djalilian H. Autologous mitochondrial transplantation enhances the bioenergetics of auditory cells and mitigates cell loss induced by H_2O_2, *Mitochondrion*, Volume 81, March 2025, 102003.

J74. Sun A, Yeh L, Imanzadeh A, Kooraki S, **Kheradvar A**, Bedayat A. The Current Landscape of Artificial Intelligence in Imaging the Transcatheter Aortic Valve Replacement. *Current Radiology Reports*. 2024;12(11-12):113-120. doi: 10.1007/s40134-024-00431-w. Epub 2024 Oct 10.

J73. Hashemi MS, Farsiani Y, Pressman GS, Amini MR, **Kheradvar A**. Effect of Cross-Platform Variations on Transthoracic Echocardiography Measurements and Clinical Diagnosis. *European Heart Journal – Imaging Methods and Practice.* 2024 Sep 23;2(3):qyae097.doi: 10.1093/ehjimp/qyae097. eCollection 2024 Jul.

J72. Zareian R., Zuke S.D., Morisawa D., Geertsema R.S., Majid M., Wynne C., Milliken J.C., and **Kheradvar A**. Early Feasibility Study of a Hybrid Tissue-Engineered Mitral Valve in an Ovine Model. *Journal of Cardiovascular Development and Disease*, 2024 Feb 19;11(2):69. doi: 10.3390/jcdd11020069.

J71. Agwu N, Recto M, **Kheradvar A**. Unmet Clinical Needs for Transcatheter Pulmonary Valves. *Annals of Biomedical Engineering*, 2023 Nov;51(11):2384-2392. doi: 10.1007/s10439-023-03328-5.

J70. Barrett A, Brown JA, Smith MA, Woodward A, Vavalle JP, **Kheradvar A**, Griffith BE, Fogelson AL. A Model of Fluid-Structure and Biochemical Interactions for Applications to Subclinical Leaflet Thrombosis, 2023, *International Journal for Numerical Methods in Biomedical Engineering*; 2023 Apr 4;e3700. doi: 10.1002/cnm.3700.

J69. **Kheradvar A** and Pedrizzetti G. State of energy of ventricular flow: A cause or the first indicator of adverse remodeling? *International Journal of Cardiology*, 2023 Jan 15;371:490-491. doi: 10.1016/j.ijcard.2022.09.042. Epub 2022 Sep 24.

J68. Trinidad F., Rubonal F., Rodriguez de Castro I., Pirzadeh I., Gerrah R., **Kheradvar A**. Rugonyi S. Effect of blood flow on cardiac morphogenesis and formation of congenital heart defects. *Journal of Cardiovascular Development and Diseases*, 2022 Sep 8;9(9):303. doi: 10.3390/jcdd9090303.

J67. Hosseinian S., Ali Pour P., **Kheradvar A**. Prospects of Mitochondrial Transplantation in Clinical Medicine: Aspirations and Challenges. *Mitochondrion*, 2022 Jul;65:33-44. doi: 10.1016/j.mito.2022.04.006. Epub 2022 Apr 30.

J66. Gabbert DD, **Kheradvar A**, Jerosch-Herold M, Oechtering TH, Uebing AS, Kramer HH, Voges I, Rickers C. MRI-based Comprehensive Analysis of Vascular Anatomy and Hemodynamics. *Cardiovascular Diagnosis and Therapy*, 2021;11(6):1367-1378.

J65. Gabbert DD, Trotz P, **Kheradvar A**, Jerosch-Herold M, Scheewe J, Kramer HH, Voges I, Rickers C. Abnormal Torsion and Helical Flow Patterns of the Neo-Aorta in Hypoplastic Left Heart Syndrome Assessed with 4D-Flow MRI. *Cardiovascular Diagnosis and Therapy* 2021;11(6):1379-1388.

J64. Rickers C, Wegner P, Silberbach M, Madriago E, Gabbert DD, **Kheradvar A**, Voges I, Scheewe J, Attmann T, Jerosch-Herold M, Kramer HH. Myocardial Perfusion in Hypoplastic Left Heart Syndrome: Risk Factors for the Right Ventricular Microcirculation. *Circulation Cardiovascular Imaging*, 2021 Oct;14(10):e012468. doi: 10.1161/CIRCIMAGING.121.012468. Epub 2021 Oct 6.

J63. Goodwin RL, **Kheradvar A**, Norris RA, Price RL, Potts JD. Collagen Fibrillogenesis in the Mitral Valve: It's a Matter of Compliance. *J Cardiovasc Dev Dis* 2021, 8(8), 98; doi:10.3390/jcdd8080098

J62. Ali Pour P, Hosseinian S, **Kheradvar A**. Mitochondrial Transplantation in Cardiomyocytes: Foundation, Methods, and Outcomes. *Am J Physiol Cell Physiol. 2021 Sep 1;321(3):C489-C503.*

J61. **Kheradvar A**, Vannan MA, Dasi LP, Pedrizzetti G. The effect of aortic root anatomy and vortex flow induced shear stress on the aortic valve leaflets. *Eur Heart J Cardiovasc Imaging. 2021 Aug 14;22(9):995-997. doi: 10.1093/ehjci/jeab031*.

J60. Karimi-Bidhendi A., Arafati A., Cheng A., Wu Y., **Kheradvar A.***, Jafarkhani H.* Fully-Automated Deep-Learning Segmentation of Pediatric Cardiac MRI of Patients with Complex Congenital Heart Diseases. *Journal of Cardiovascular Magnetic Resonance*, 2020 Nov 30;22(1):80. doi: 10.1186/s12968-020-00678-0. (*co-corresponding author)

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J59. **Kheradvar A**, Jafarkhani H, Guy TS, Finn JP. Prospect of artificial intelligence for the assessment of cardiac function and treatment of cardiovascular disease, *Future Cardiology*, 2021 Mar;17(2):183-187. Epub 2020 Sep 16.

J58. Arafati A, Morisawa D, Avendi MR, Amini, MR, Assadi RA, Jafarkhani H, **Kheradvar A**. Generalizable Fully Automated Multi-Label Segmentation of 4-Chamber View Echocardiograms based on Deep Convolutional Adversarial Networks. *Journal of the Royal Society Interface*, 2020, Aug;17(169):20200267.

J57. Wang DD, Qian Z, Vukicevic M, Engelhardt S, **Kheradvar A**, Zhang C, Little SH, Verjans J, Comaniciu D, O'Neill WW, Vannan MA. 3D Printing, Computational Modeling and Artificial Intelligence for Structural Heart Disease. *Journal of American College of Cardiology: Cardiovascular Imaging*, 2021 Jan;14(1):41-60.

J56. Ali Pour P, Kenney CM, **Kheradvar A**. Bioenergetics Consequences of Mitochondrial Transplantation in Cardiomyocytes, *J Am Heart Assoc. 2020 Apr 7;9(7):e014501. doi: 10.1161/JAHA.119.014501. Epub 2020 Mar 23.*

J55. Kulkarni A, Morisawa D, Gonzalez D, **Kheradvar A**. Age-related Changes in Diastolic Function in Children: Echocardiographic Association with Vortex Formation Time, *Echocardiography*, 2019 October 36(10); 1869-1875.

J54. Arafati A, Hu P, Finn JP, Rickers C, Cheng AL, Jafarkhani H, **Kheradvar A**. Artificial Intelligence in Pediatric and Adult Congenital Cardiac MRI: An Unmet Clinical Need, *Cardiovascular Diagnosis and Therapy*, 2019 October Vol 9, Supplement 2.

J53. **Kheradvar A**, Rickers C, Morisawa D, Kim M, Hong GR, Pedrizzetti G. Diagnostic and Prognostic Significance of Cardiovascular Vortex Formation, *Journal of Cardiology*, 2019 November 74(5); 403-11.

J52. Zareian R, Tseng JC, Fraser R, Meganck J, Kilduff M, Sarraf M, Dvir D, **Kheradvar A**. Effect of Stent-Crimping on Calcification of Transcatheter Aortic Valves, *Interactive CardioVascular and Thoracic Surgery*, 2019 Jul 1;29(1):64-73 (Featured on the cover of the July 2019 issue).

J51. Gabbert D, Hart C, Jerosch-Herold M, Wegner P, Salehi Ravesh M, Voges I, Kristo I, AL Bulushi A, Scheewe J, **Kheradvar A**, Kramer HH, Rickers C. Heart beat but not respiration is the main driving force of the systemic venous return in the Fontan circulation; *Scientific Reports*, 2019 Feb 14;9(1):2034.

J50. Morisawa D, Falahatpisheh A, Avenatti E, Little SH, **Kheradvar A**. Intraventricular Vortex Interaction between Transmitral Flow and Paravalvular Leak, *Scientific Reports*, 2018 Oct 23;8(1):15657.

J49. **Kheradvar A**, Zareian R, Kawauchi S, Goodwin RL, Rugonyi S. Animal Models for Heart Valve Research and Development. *Drug Discovery Today: Disease Models*, 2017 Summer;24:55-62.

J48. **Kheradvar A**. On the accuracy of intracardiac flow velocimetry methods, *Journal of Echocardiography*, 2017 June;15(2): 67-69.

J47. Avendi MR, **Kheradvar A**, Jafarkhani H. Automatic Segmentation of the Right Ventricle from Cardiac MRI Using a Learning-based Approach, *Magnetic Resonance in Medicine,* 2017 Dec;78(6):2439-2448.

J46. Alavi SH, Soriano Baliarda M, Bonessio N, Valdevit L, **Kheradvar A**. A Tri-leaflet Nitinol Mesh Scaffold for Engineering Heart Valves, *Annals of Biomedical Engineering,* 2017 Feb;45(2):413-426.

J45. Sievers HH, Putman LM, **Kheradvar A**, Gabbert D, Wegner P, Scheewe J, Salehi-Ravesh M, Kramer HH, Rickers C. 4D flow streamline characteristics of the great arteries twenty years after Lecompte and direct spiral arterial switch operation (DSASO) in simple TGA, *Global Cardiology Science and Practice* 2016 (3):29.

J44. Dasi LP, Hatoum H, **Kheradvar A**, Zareian R, Alavi SH, Sun W, Martin C, Pham T, Wang Q, Midha P, Gowda VS, Yoganathan A. On the Mechanics of Transcatheter Aortic Valve Replacement, *Annals of Biomedical Engineering*, 2017 Feb;45(2):310-331.

J43. Falahatpisheh A, Morisawa D, Toosky TT, **Kheradvar A**. A Calcified Polymeric Valve for Valve-in-Valve Applications, *Journal of Biomechanics,* 2017 Jan; 50(1): 77–82.

J42. Sievers HH, **Kheradvar A**, Kramer HH and Rickers C. 3D Heart Model and 4D Flow MRI 20 Years after Spiral Arterial Switch Operation. *Thorac Cardiov Surg Reports*, 2016 Dec; 05(01): 44-46.

J41. Hajiaghayi M, Groves EM, Jafarkhani H, and **Kheradvar A**. A 3D Active Contour Method for Automated Segmentation of the Left Ventricle from Magnetic Resonance Images, *IEEE Transactions on Biomedical Engineering,* 2017 Jan; 64 (1): 134-144.

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J40. Avendi MR, **Kheradvar A**, Jafarkhani H. A Combined Deep-Learning and Deformable-Model Approach to Fully Automatic Segmentation of the Left Ventricle in Cardiac MRI, *Medical Image Analysis,* 2016 Feb 6;30:108-119.

J39. Rickers C, **Kheradvar A**, Sievers HH, Falahatpisheh A, Wegner P, Gabbert D, Jerosch-Herold M, Hart C, Voges I, Putman LM, Kristo I, Fischer G, Scheewe J, Kramer HH. Is the Lecompte Technique the last word on transposition of the great arteries repair for all patients? A magnetic resonance imaging study including a spiral technique, two decades postoperatively, *Interactive CardioVascular and Thoracic Surgery*, 2016 Jun;22(6):817-25.

J38. Falahatpisheh A and **Kheradvar A**. A Framework for Synthetic Validation of 3D Echocardiographic Particle Image Velocimetry. *Meccanica,* 2017 Feb, 52(3): 555–561.

J37. Falahatpisheh A, Rickers C, Gabbert DD, Heng EL, Stalder A, Kramer HH, Kilner PJ, **Kheradvar A**. Simplified Bernoulli's method significantly underestimates pulmonary transvalvular pressure Drop. *Journal of Magnetic Resonance Imaging*, 2016;43:1313–1319. (Featured on the cover of the June 2016 issue)

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Research Grants and Contracts

Active:

G38. mPI for NIH Award# 1R56HL173809-01: "High-speed 4D echocardiography system with adjustable multi-planar acquisition", 09/15/2024 to 08/31/2025. Total Budget: $677,635.

G37. PI for NIH Award# 3R01HL153724-02S1: "Volumetric Echocardiographic Particle Image Velocimetry for Grading the Severity of Mitral Valve Regurgitation", 09/01/2023 to 08/31/2024. Total Budget: $645,279.

G36. PI for NIH Award# 1R01HL162687-01A1, "Reciprocal effects between scaffold geometry and ventricular vortex flow on viability and performance of tissue-engineered mitral valve", 01/01/2023 to 12/31/2028. Total budget: $3,357,438.

G35. PI for NSF travel supplement Award# 2109959: "Collaborative Research: Deciphering the synergistic interaction between hemodynamics and genetics that form the heart", 06/01/2021- 05/31/2024. Total Budget: $20,000

G34. Co-PI for ICTS Pilot Award: "A novel therapeutic strategy of mitochondrial transplantation into inner ear for the treatment of hearing loss", 07/01/2022 to 06/30/2023. Total budget: $25,000.

G33. PI for NIH Award# 1 R01 HL153724-01A1: "The state of energy in the right ventricle of patients with pulmonary arterial hypertension", 01/01/2022 to 12/31/2027. Total budget: $ 3,182,806

G32. mPI for NIH Award# 1 R01 HL157631-01A1: "Computational and Experimental Modeling of Subclinical Leaflet Thrombosis in Bioprosthetic Aortic Valves", 01/01/2022 to 12/31/2026. Total budget: $ 2,698,540

G31. PI for NSF Award# 2109959: "Collaborative Research: Deciphering the synergistic interaction between hemodynamics and genetics that form the heart", 06/01/2021- 05/31/2024. Total Budget: $325,000

Completed:

G30. PI for NIH Award# 1 R21 HD105889-01: "A growth-accommodating transcatheter pulmonary valve system for young children", 07/01/2021- 06/30/2023. Total budget: $ 431,750

G29. PI for 2020 AHA/Amazon Web Services 4.0 Data Grant Portfolio - AI and ML (19AIML35180067): "Cloud-based AI platform for automatic segmentation and analysis of pediatric Cardiac MRI datasets", Until November 2023. Total budget: $200,000

G28. PI for Canon Medical Systems USA Inc: "Clinical Evaluation of Aplio i900 V6.5 Release." 11/2021-03/2022.

G27. PI for UCI POP grant (the Anthem and Danaher Track Award): "Helix Cardia: A Minimally-Invasive Whole-Heart Assist Device", 06/2020 to 05/2021.

G26. PI for UCOP Emergency COVID-19 Research Seed Funding (R00RG2416): "AI-based Platform to Predict COVID-19 Progress and Outcome based on Patients' Chest X-ray".

G25. PI for UCI POP grant: "Feasibility Studies of a Bio-Inspired Transcatheter Atrioventricular (Mitral and Tricuspid) Valve Technology in Sheep", Until May 2019.

G24. PI for the American Heart Association Grant-in-Aid: "Assessing the Risk of Transcatheter Heart Valve Calcification and Biomechanical Failure", until June 30, 2019.

G23. PI for NIH Award# 1 R21 EB021513-01A1: "Ultrasound-Guided Delivery System for Accurate Positioning/Repositioning of Transcatheter Aortic Valves"; until July 2018.

G22. PI for the American Heart Association Innovative Research Award: "IVUS-Guided Delivery System for Accurate Positioning/Repositioning of Transcatheter Aortic Valves", until December 2017.

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G21. Mentor for the American Heart Association postdoctoral grant (Fellow: S Hamed Alavi, Ph.D.): "Tissue Engineered Heart Valve with a Non-Degradable Scaffold", until December 2017.
G20. PI for NIH UC Center for Accelerated Innovation for the project: "A bio-inspired transcatheter mitral valve", until September 2017
G19. PI for NIH UC Center for Accelerated Innovation for the project: "Development of a Self-Regenerative Hybrid Heart Valve", until July 2017.
G18. Gift from the Edwards Lifesciences Foundation for Preclinical Studies Related to the Self-Regenerating Hybrid Heart Valve program.
G17. Mentor for the American Heart Association postdoctoral grant (Fellow: Ahmad Falahatpisheh, Ph.D.): "Computation of kinetic energy dissipation inside the right heart of patients with repaired tetralogy of Fallot", until June 2016.
G16. PI for Children's Heart Foundation grant: "A Self-Regenerative Hybrid Heart Valve", Until December 31, 2015.
G15. Mentor for the American Heart Association Medical Student Research Program (Fellow: S. Reed Plimpton): "Development and Testing of a Bio-Prosthetic Mitral Valve with Dynamic Annulus", 06/01/2013-08/31/2014
G14. PI for 2013-14 CORCL's Multi-Investigator Research Grant: 3D Segmentation of Cardiac Magnetic Resonance Images", Until July 2015.
G13. PI for 2013 Unmet Clinical Needs in Cardiovascular Medicine Seed Grant Competition: "Development of a Bio-Inspired Transcatheter Mitral Valve for Transapical Implantation", Until December 31, 2015.
G12. PI for American Heart Association Grant-in-Aid: "Assessment of the right ventricular flow in patients with RV dysfunction", until December 31, 2015.
G11. Gift from the Edwards Lifesciences for the Development and Testing of a First Hybrid, Self-Regenerating Heart Valve program.
G10. PI for ICTS Translation of Device-Based Research Grant: "Animal Feasibility Study for the First Patient-Specific Hybrid Heart Valve". Until July 2015
G09. Mentor for the American Heart Association predoctoral grant (Fellow: Ahmad Falahatpisheh): "Modeling the flow inside the right heart of patients with repaired tetralogy of Fallot" until December 31, 2014.
G08. PI for the California-Catalonia Program for Engineering Innovation Award: "Development of a Biocompatible Tissue Engineered Heart Valve Leaflet Using Stem Cell" until November 2013
G07. PI for Coulter Translational Research Award: "Development of a Novel Self-expandable Bioprosthetic Heart Valve for Percutaneous Delivery and Implantation" until July 2014.
G06. PI for Leducq Foundation's Transatlantic Career Development Award in Cardiovascular and Neurovascular Research: "Flow through the right heart after repair of tetralogy of Fallot: an Image-based modeling approach" until July 2014.
G05. PI for the California-Catalonia Program for Engineering Innovation Award: "Development of a Biocompatible Tissue Engineered Heart Valve Leaflet Using Endothelial Progenitor Cells" until November 2012.
G04. PI for ICTS Pilot Grant: "Development of a Novel Self-expandable Bioprosthetic Heart Valve for Percutaneous Delivery and Implantation", completed.
G03. PI for a seed grant from Edwards Lifesciences Center for Advanced Cardiovascular Technology: "Development of a Novel Hybrid Tissue Material for Heart Valve Leaflet", completed.
G02. PI for AHA Beginning Grant-in-Aid: "Development of 3D Echocardiographic Particle Image Velocimetry (Echo-PIV) for Assessment of Right Ventricular Flow Pattern, completed.
G01. PI for SC COBRE supplement grant: "Modeling Development of Tetralogy of Fallot in-silico", completed.

Books and Chapters

B01. **Kheradvar A** and Pedrizzetti G. Vortex Formation in the Cardiovascular System. ISBN: 1447122879, Springer Cardiology and Angiology (2012).
B02. Plimpton SR, Liu, WF and **Kheradvar A**. Immunological and Phenotypic Considerations in Supplementing Cardiac Biomaterials with Cells (book chapter), in "Biomaterials for Cardiac Regeneration" by Springer (2015); editors: Mark Ruel and Erik Suuronen. ISBN 978-3-319-10971-8.

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B03. **Kheradvar A**. Principles of Heart Valve Engineering. ISBN: 9780128146613, Academic Press (2019).

Issued U.S. Patents

IP43. Jafarkhani H, Karimi-bidhendi S, **Kheradvar A**. Synthetically generating medical images using deep convolutional generative adversarial networks; U.S. Patent# 11,990,224.
IP42. **Kheradvar A**, Kelley GS, Sarraf M. Percutaneous heart valve delivery and implantation system enabling fracture of a previously present valve; U.S. Patent# 11,730,593.
IP41. **Kheradvar A** and Kelley GS. Delivery system for transcatheter valves; U.S. Patent# 11,701,227.
IP40. **Kheradvar A** and Kelley GS. Atrial cage for placement, securing and anchoring of atrioventricular valves; U.S. Patent# 11,666,444.
IP39. Arafati A, Jafarkhani H, **Kheradvar A**. Fully automated four-chamber segmentation of echocardiograms; U.S. Patent# 11,651,487.
IP38. **Kheradvar A**. Whole heart assist device; US Patent# 11,376,417.
IP37. **Kheradvar A** and Hosmer R. Synchronizing a pulsatile cardiac assist device with a pacemaker; U.S. Patent# 11,369,784.
IP36. **Kheradvar A**. Ultrasound-guided delivery system for accurate positioning/repositioning of transcatheter heart valves; U.S. Patent# 11,364,118.
IP35. Zareian R and **Kheradvar A**. Method for identification and quantification of tissue calcification; U.S. Patent# 11,328,416.
IP34. Avendi MR, Jafarkhani H and **Kheradvar A**. Automated segmentation of organ chambers using deep learning methods from medical imaging; U.S. Patent# 11,182,896.
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IP32. **Kheradvar A** and Kelley G. Delivery system for transcatheter detachment of a stent from the delivery device using single-ended draw lines; U.S. Patent# 10,952,880.
IP31. **Kheradvar A** and Zareian R. Methods for development of hybrid tissue engineered valve with polyurethane core; U.S. Patent# 10,792,396.
IP30. **Kheradvar A** and Kelley GS. Delivery system for percutaneous delivery and implantation of atrioventricular heart valves; U.S. Patent# 10,758,347.
IP29. **Kheradvar A**. Calcified polymeric valve and vessels for valve-in-valve applications; U.S. Patent#10,629,096.
IP28. **Kheradvar A** and Kelley GS. Delivery system for transcatheter detachment of a stent from the delivery device; U.S. Patent# 10,617,543.
IP27. **Kheradvar A** and Zuke SD. Mesh enclosed tissue constructs; U.S. Patent# 10,610,616.
IP26. Avendi MR, Jafarkhani H and **Kheradvar A**. Automated segmentation of organ chambers using deep learning methods from medical imaging; U.S. Patent# 10,521,902.
IP25. Falahatpisheh A and **Kheradvar A.** Ultrasound-based volumetric particle tracking method; U.S. Patent# 10,460,452.
IP24. Falahatpisheh A and **Kheradvar A**. Multi-plane method for three-dimensional particle image velocimetry; U.S. Patent# 10,345,132.
IP23. Kulinsky L and **Kheradvar A**. Imprinter for Conformal Coating of Three-Dimensional Surfaces; U.S. Patent# 10,245,614.
IP22. Falahatpisheh A and **Kheradvar A**. Method for post-processing flow-sensitive phase contrast magnetic resonance images; U.S. Patent# 10,134,127.
IP21. Alavi SH and **Kheradvar A**. Apparatus and process for growing a heart valve in three-dimensions; U.S. Patent# 10,016,461.
IP20. **Kheradvar A**. Transcatheter mitral Valve. U.S. Patent# 9,968,445.
IP19. **Kheradvar A**, and Alavi S.H. Tubular scaffold for fabrication of heart valves; U.S. Patent# 9,968,446.
IP18. Falahatpisheh A and **Kheradvar A**. Ultrasound-based volumetric particle tracking method; U.S, patent# 9,962,142.
IP17. Alavi SH and **Kheradvar A**. Mesh enclosed tissue constructs; U.S. Patent# 9,925,296.

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IP16. Jafarkhani H., Hajiaghayi, M., Groves, E.M., **Kheradvar, A**. Automated 3D reconstruction of the cardiac chambers from MRI or ultrasound, U.S. Patent# 9,875,581.
IP15. **Kheradvar A**, Kelley G and Gharib M. Handle mechanism and functionality for repositioning and retrieval of transcatheter heart valves, U.S. Patent#9,744,037.
IP14. **Kheradvar A**, Kelley G and Gharib M. Percutaneous heart valve delivery systems. U.S. Patent# 9,668,859.
IP13. **Kheradvar A**, Gharib M, Grosberg A. Cardiac assist system using helical arrangement of contractile bands and helically-twisting cardiac assist device, U.S. Patent#9,656,009
IP12. Alavi SH and **Kheradvar A**. Mesh enclosed tissue constructs; U.S. Patent#8,936,650
IP11. **Kheradvar A** and Karmaus W. Nursing bottle apparatus for improvement of suckling; U.S. Patent# 8,915,387
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IP09. **Kheradvar A.** Implantable prosthetic valves and methods; U.S. Patent#8,876,897
IP08. **Kheradvar A**, Gharib M, Hickerson A. Helically actuating positive-displacement pump. U.S. Patent# 8,794,937.
IP07. **Kheradvar A**, Sutton MA, Membrane-deformation mapping technique, U.S. Patent# 8,767,049.
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IP05. **Kheradvar A**, Gharib M. In-situ formation of a valve. U.S. Patent# 8,348,999.
IP04. **Kheradvar A**, Gharib M. In-situ formation of a valve. U.S. Patent# 8,133,270.
IP03. **Kheradvar A**, Gharib M, Hickerson A. Helically actuating positive-displacement pump. U.S. Patent# 7,883,325
IP02. **Kheradvar A**, Gharib M. Monolithic in situ forming valve system. U.S. Patent# 7,780,724.
IP01. **Kheradvar A**, Gharib M. Implantable small percutaneous valve and methods of delivery. U.S. Patent# 7,331,991

Issued Foreign Patents

1. **CN103857361A**: 经皮的心瓣膜递送系统 (Percutaneous heart valve delivery systems)
2. **EP2836171**: Percutaneous Heart Valve Delivery Systems
3. **EP2688562:** Mesh enclosed tissue constructs
4. **EP2739247**: Percutaneous Heart Valve Delivery Systems
5. **EP2967945**: Handle mechanism and functionality for repositioning and retrieval of transcatheter heart valves
6. **EP2931179**: Apparatus and process for growing a heart valve in three-dimensions

Pending Patent Applications

P22. **Kheradvar A**, and Pedrizzetti G. Characterization of three-dimensional incompressible flows using echo particle image velocimetry. US 20240020841.
P21. **Kheradvar A**, and Nguyen DC. Growth-accommodating valve system. US 20230263627.
P20. **Kheradvar A**, and Kelley GS. Distensible knitted wire mesh for a cardiac sleeve. US 20230256232.
P19. **Kheradvar A**, and Kelley GS. Percutaneous medical device delivery system. US 20220296879, allowed to be issued.
P18. **Kheradvar A** and Su J. Percutaneous heart valve delivery systems; US 20220296369.
P17. **Kheradvar A**, and Nguyen DC. Device for transcatheter grabbing and securing a native mitral valve leaflet to a prosthesis. US 20220273434.
P16. **Kheradvar A.** and Djalilian H.R. System for irrigating the upper aerodigestive tract and neighboring areas. US 20220023020, allowed to be issued.
P15. **Kheradvar A.** and Ali Pour P. Mitochondrial transplantation to alter energy metabolism. US 20210261921.
P14. **Kheradvar A** and Shabari FA. System of epicardial sensing and pacing for synchronizing a heart assist device. US 20210128000.
P13. **Kheradvar A** and Nguyen D. Growth-accommodating valve system; US 20210137676.
P12. **Kheradvar A** and Ali Pour P. Mitochondrial transplantation to alter energy metabolism; US 20200181578.

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P11. **Kheradvar A**. Percutaneous heart valve delivery systems; US 20140277414.
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C09. Saber NR, Wood JC, **Kheradvar A**. A computational methodology for stent-leaflet interactions in minimally-invasive heart valves. *ASAIO Journal*. 54(2):3A, March/April 2008.

C08**.** **Kheradvar A**, Assadi R, Jutzy KR, Bansal R. Transmitral Vortex Formation: A Reliable Indicator for Pseudonormal Diastolic Dysfunction. *Journal of the American College of Cardiology* 51(10) supplement A: A104, March 2008.

C07. **Kheradvar A**. Milano M, Gorman RC, Gorman III JH, Gharib M. Estimation of elastic and viscous properties of the left ventricle based on annulus plane harmonic behavior. Proceedings of 28th Annual International Conference of the IEEE-EMBS, Aug. 2006 Pages:616 - 619

C06. **Kheradvar A**, Johnson D, Kasalko J, Gharib M. Changing profile heights in perimount™ mitral valve: An in-vitro quantitative flow visualization study. *ASAIO Journal*. 51(2):32A, March/April 2005.

C05. **Kheradvar A**, Gorman RC, Gorman III, JH, Zeeshan A, Gharib M. Evaluation of Isovolumic Relaxation Phase in the process of Ventricular Remodeling following Myocardial Infarction. Proceedings of 26th Annual International Conference of the IEEE-EMBS, Volume: 2 , 1-5 Sept. 2004 Pages:3654-7

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C04. Gharib M, Rambod E, **Kheradvar A**, Sahn D. On the Issue of Optimal Trans-Mitral Flow. *XXI International Congress of Theoretical and Applied Mechanics* Warsaw, Poland, August 15-21, 2004

C03. Amirzargar AA, Abodolreza T, Farideh K, **Kheradvar A**, et al. Human leukocyte antigen association in optic neuritis and progression to multiple sclerosis: The results of a four-year follow up study. *Tissue Antigens* 64 (4): 368-368 Oct 2004

C02. Nikbin B, Tabasi AR, **Kheradvar A**, Khosravi F, Naroueynejad M, Danesh A, Amirzargar AA. Optic neuritis and HLA association in Iranian patients. *Tissue Antigens* 59: 71-71 Suppl. 2, 2002

C01. Sadighi A, **Kheradvar A**. Gubernaculopexy; A novel technique for placement of the undescended testis in the scrotum. *3rd International Conference of the Egyptian Association of Pediatric Surgeons* (May 5-7, 1999).

Conference Presentations at Biomedical Engineering Society (BMES) and Systemwide UC Bioengineering

CP34. Trinidad F, Rubonal F, **Kheradvar A**, Rugonyi S. Effects of Hemodynamics on Developing Chicken Hearts. 23rd UC Systemwide Bioengineering Symposium, August 2022, Santa Barbara, CA

CP33. Agwu N, Nguyen D, Kelley G, Recto M, **Kheradvar A.** Progress in development of a growth accommodating pulmonary heart valve for pediatric patients. 23rd UC Systemwide Bioengineering Symposium, August 2022, Santa Barbara, CA

CP32. Ali Pour P, **Kheradvar A**. Feasibility of Transplantation of Non-Autologous Mitochondria into Cardiomyocyte. BMES 2018 Annual Scientific Meeting, October 17-20, Atlanta, GA

CP31. Behrens D, Agnew W, **Kheradvar A**, Tang W. A conceptual piezoelectric sensor to monitor blood flow in coronary stents, 19th UC Systemwide Bioengineering Symposium, June 2018, Riverside, CA.

CP30. Ali Pour P, Zareian R and **Kheradvar A**. Mitochondrial Transplantation through Co-incubation into Cardiomyocyte. BMES 2017 Annual Scientific Meeting, October 11-14, Phoenix, AZ.

CP29. Zuke S, Alavi SH and **Kheradvar A**. Biocompatibility tests on a Carbothane scaffold for hybrid tissue engineered heart valve applications. BMES 2016 Annual Scientific Meeting, October 5-8, Minneapolis, MN.

CP28. Razaz Zadeh M, Falahatpisheh A, **Kheradvar A**, May-Newman K. Reynolds Stress Assessment in the LVAD-Assisted Heart using High-Speed PIV. BMES 2014 Annual Scientific Meeting, October 22-25, San Antonio, TX.

CP27. Alavi SH, Kheradvar A. An Index for Assessing the Crimping Damage of Pericardial Leaflets in Transcatheter Heart Valves. BMES 2013 Annual Scientific Meeting, September 25-28, Seattle, WA.

CP26. Falahatpisheh A and **Kheradvar A**. Novel Computational Model for Optimal Reduction of the Stent Collapsed Profile: Applications in Transcatheter Aortic Valve Implantation. BMES Annual Meeting, October 2012, Atlanta, GA.

CP25. Falahatpisheh A, Pahlevan N, Dueitt B, **Kheradvar A**. Effect of the Mitral Valve Leaflet Asymmetricity on the Shape of Transmitral Vortex. BMES Annual Meeting, October 2012, Atlanta, GA.

CP24. Su JL, Falahatpisheh A, and **Kheradvar A.** Development of a TAVI Catheter System for Percutaneous Repositioning and Retrieval of the Valve. BMES Annual Meeting, October 2012, Atlanta, GA.

CP23. Alavi SH, Ruiz V, Krasieva T, Botvinick EL, and **Kheradvar A**. Characterization of Fiber Orientation under Cyclic Load: Correlation to Bioprosthetic Valve Failure. BMES Annual Meeting, October 2012, Atlanta, GA.

CP22. Alavi SH and **Kheradvar A**. Self-Regenerative Engineered Heart Valves: From Conception to Performance. BMES Annual Meeting, October 2012, Atlanta, GA

CP21. Falahatpisheh A., **Kheradvar A**., Vortex Instability of Transmitral Flow, BMES 2011, October 2011, Hartford, CT.

CP20. Alavi SH, Botvinick E, **Kheradvar A**. Characterization of Collagen Fiber Orientation by Multiphoton Imaging in Loading-Unloading Phases, BMES Annual Fall Scientific Meeting, October 2011, Hartford, CT

CP19. Alavi SH, Nazemi L, Liu W, **Kheradvar A**. Effect of Co-Culture on Immunogenicity of a Tissue Engineered Construct, BMES Annual Fall Scientific Meeting, October 2011, Hartford, CT

CP18. Alavi SH, **Kheradvar A**. A Hybrid Self-Regenerative Engineered Tissue for Heart Valve Leaflets, BMES Annual Fall Scientific Meeting, October 2011, Hartford, CT

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CP17. Falahatpisheh A, **Kheradvar A**. A Computational Model to Quantify Leaflet Wrinkling: Road to Assess Tissue Fatigue & Leaflet Tearing, BMES 2010 Annual Fall Scientific Meeting, October 6-9, Austin, TX.

CP16. Falahatpisheh A, Alavi SH, Stinson SJ, Junor L, Goodwin RL, **Kheradvar A**. Numerical Study of Fluid-Structure Interaction in a Developing Chick Heart, BMES 2010 Annual Fall Scientific Meeting, October 6-9, Austin, TX.

CP15. Alavi SH, Junor L, Goodwin RL, **Kheradvar A**, A Hybrid, Tissue Engineered Leaflet for Bioprosthetic Heart Valves. BMES 2010 Annual Fall Scientific Meeting, October 6-9, Austin, TX, USA.

CP14. Biechler S, Moraveji SJ, Weidner J, Goodwin RL, **Kheradvar A**. A Computational Study of the Early Heart Tube: Paving the Way for Regenerative Medicine? BMES 2010 Annual Fall Scientific Meeting, October 6-9, Austin, TX.

CP13. Moraveji SJ, Biechler S, Weidner J, Goodwin RL, **Kheradvar A.** Multiscale Modeling of Blood Rheology in a Developing Heart: When Granularity Becomes Remote? BMES 2010 Annual Fall Scientific Meeting, October 6-9, Austin, TX.

CP12. Biechler S, Moraveji SJ, Weidner J, Goodwin RL, **Kheradvar A**. Determination of Atrioventricular Cushion Material Properties in a Developing Chick Embryo. BMES 2010 Annual Fall Scientific Meeting, October 6-9, Austin, TX.

CP11. Moraveji SJ, Biechler S, Weidner J, Goodwin RL, **Kheradvar A.** Pumping During Fetal Cardiac Development: Peristaltic or Impedance? BMES 2010 Annual Fall Scientific Meeting, October 6-9, Austin, TX.

CP10. Biechler SV, Weidner J, Goodwin R, **Kheradvar A.** The Morphogenesis of Atrioventricular Valves Due to Flow-Induced Forces. *BMES 2009 Annual Fall Meeting*, Pittsburgh, PA, October 2009.

CP09. **Kheradvar A** and Gharib M. Formation of a Bioprosthetic Heart Valve within the Ventricle: A Percutaneous approach. *BMES 2009 Annual Fall Meeting*, Pittsburgh, PA, October 2009.

CP08. Mangual JO, Jung B and **Kheradvar A**. Modeling Radial Viscoelastic Behavior of the Left Ventricle in a Cardiac Cycle. *BMES 2009 Annual Fall Meeting*, Pittsburgh, PA, October 2009.

CP07. Falahatpisheh A., Burnside J. and **Kheradvar A**. Design Optimization of a Dynamics Mitral Bioprosthetic via Computational Modeling. *BMES 2009 Annual Fall Meeting*, Pittsburgh, PA, October 2009.

CP06. Falahatpisheh A and **Kheradvar A**. Computational Modeling of repaired Tetralogy of Fallot. *BMES 2009 Annual Fall Meeting*, Pittsburgh, PA, October 2009.

CP05. **Kheradvar A** and Gharib M. How ventricular pressure drop can affect the mitral valve dynamics. *BMES 2007 Annual Fall Meeting*, Los Angeles, CA, September 2007.

CP04. **Kheradvar A,** Milano M, Gharib M. Assessment of myocardial global viscoelastic behavior by MR imaging. *BMES 2006 Annual Fall Meeting*, Chicago, IL, October 2006.

CP03. **Kheradvar A**. Milano M, Gorman RC, Gorman III JH, Gharib M. LV dynamical model with time-varying coefficients resulted from annular plane displacement and LVP. *BMES 2005 Annual Fall Meeting*, Baltimore, MD, September 2005

CP02. **Kheradvar A**, Gorman RC, Gorman III JH, Zeeshan A, Gharib M. Assessment of variations in Isovolumic Relaxation Phase during post MI cardiac remodeling, *BMES 2004 Annual Fall Meeting*, Philadelphia, PA, October 2004

CP01.**Kheradvar A**, Gharib M. Correlation between Vortex Formation Number and the rate of change of left ventricular pressure in Diastole. *BMES 2003 Annual Fall Meeting*, Nashville, TN.

Institutional Research Protocols

IACUC Protocols (Large Animal):

- AUP-21-039. Testing a growth-accommodating transcatheter pulmonary valve system for young children
- AUP-23-123. HelixCardia Acute Animal Study
- 2012-3071. In Vivo Assessment of a Novel Self- Regenerating Hybrid Heart Valve
- 2014-3136. Testing of a Bio-Prosthetic Mitral Valve with Dynamic Annulus

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- 2016-3195. Ultrasound-Guided Delivery System for Accurate Positioning/Repositioning of Transcatheter Aortic Valves

IRB protocols (Human Subject Protocols):

- UCI IRB #394 Clinical Evaluation of Echocardiography system Aplio i900 V6.5 Release
- STUDY00001683: The state of energy in the right ventricle of patients with pulmonary arterial hypertension
- HS#2013-9355: Modeling the flow inside the right heart of patients with repaired tetralogy of Fallot
- HS#2014-9986: Assessment of the right ventricular flow in patients with RV dysfunction
- HS# 2011-8033 Development of 3D Echocardiographic Particle Image Velocimetry for Assessment of Right Ventricular Flow Pattern

Professional Service

- Member, ZRG1 RCCS-U (02) SEP, NIH ZRG1 RCCS-U (02) Special Emphasis Panel (SEP)- Member Conflict: Cardiac Sciences (07/17/2024).
- Chair, ZHL1 CSR-O (M1-M2), 05/2024, Catalyze Product Development, and Catalyze Enabling Technologies.
- Member, search committee for the Annals of Biomedical Engineering's Editor-in-Chief, since 2023
- Member, TDPS NIH study section, 10/2023.
- Member, IACUC committee, UCI, since 09/2023.
- Chair, ZRG1 RCCS-R (02), member conflict special emphasis NIH panel review, 07/13/2023.
- Member, UCI Board on Undergraduate Scholarships, Honors and Financial Aid (BUSHFA), 2023 to present.
- Editorial Board Member, Journal of Cardiovascular Development (2022 to 2024)
- Panelist: How to Use the AHA Precision Medicine Platform to Analyze Data; American heart Association Research Leaders Academy, September 12-14, 2022, San Diego, CA
- Co-chair for cardiac biomechanics session at Society of Engineering Science 55th Annual Technical Meeting, October 10-12, 2018, Madrid, Spain.
- Chair for Cardiac MRI mini-symposium at the 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, July 17-21, 2018, Honolulu, HI.
- Session chair for Cardiovascular Imaging session at BMES 2017 Annual Meeting on October 13, 2017, Phoenix, AZ.
- Associate Editor, Annals of Biomedical Engineering (2017-Present)
- Member of the organizing committee, The 8th International Bio-Fluid Symposium, Caltech, Pasadena, CA, February 12–14, 2016.
- Session chair for BMES 2016 Annual Meeting (Heart Valve Structure, Function and Disease I) on October 7, 2016, Minneapolis, MN.
- Member, Research Committee of the American Heart Association, Western States Affiliate (2014-16).
- Session Chair, Biomaterials and implants at UC Systemwide Bioengineering Program, June 18-20, 2014, Irvine.
- Co-organizer, Mathematics Guiding Bioartificial Heart Valve Design (MBI Institute Ohio State University, Columbus, OH, October 2013). This NSF funded workshop addresses the development of mathematical and computational modeling techniques that can be used to facilitate the development and optimal design of heart valve prostheses and other cardiovascular devices.
- Track Chair, Structural Heart Disease, ASME 6th Frontiers in Biomedical Devices Conference & Exhibition
- Invited Track Chair, Mechanics of Heart Valves: from Structure to Flow", European Mechanics Society (Euromech) Colloquium: Cardiovascular Fluid Mechanics, in Cagliari, Italy (June 27-29, 2011)
- Member, NHLBI Systems Biology Study Section (ZRG1 VH-D (50))
- Member, NICHD 3D Printing Study Section (ZHD1 DSR-K(51))

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- Member, ZRG1 CVRS-Q 80: Cardiovascular and Respiratory Sciences NIH Research Enhancement Award Review
- Grant Review Panels:
  - National Institute of Health (NIH)
  - National Science Foundation (BMMB/EMBS, Biophotonics, Biosensing, Biotransport, Biomedical Engineering, ERC and MRI)
  - The Natural Sciences and Engineering Research Council of Canada (NSERC) and the Canadian Institutes of Health Research (CIHR)
  - National Medical Research Council, Ministry of Health, Singapore
  - Dutch Technology Foundation STW
  - Heart Research UK
  - American Heart Association
  - Scientific Review Committee member for Institute for Clinical & Translational Science at UCI
  - The Science Foundation Ireland (SFI)
  - Health Research Council of New Zealand
  - Chilean Science Agency (CONICYT)
  - British Heart Foundation
  - The French National Research Agency (ANR)
- Editorial Board member, ASAIO Journal (Journal of American Society of Artificial Internal Organs), 2005-2013.
- Journal Article Reviewer:
  - Proceedings of National Academy of Sciences (PNAS)
  - Journal of Cardiovascular Magnetic Resonance (JCMR)
  - JACC Basic to Translational Science
  - Proceedings of the Royal Society of London A
  - Lancet
  - Journal of American Heart Association
  - Scientific Reports
  - Circulation
  - Circulation Cardiovascular Imaging
  - Circulation Cardiovascular Intervention
  - Science
  - Experimental Mechanics
  - Journal of Cardiovascular Translational Research
  - International Journal of Cardiovascular Imaging
  - Journal of Mechanics in Medicine and Biology
  - Journal of Fluid Mechanics
  - Journal of Magnetic Resonance Imaging
  - Journal of Royal Society Interface
  - Journal of American College of Cardiology
  - Ultrasonics
  - Journal of Biomedical Materials Research: Part A
  - Tissue Engineering
  - Multiscale Modeling and Simulation (SIAM)
  - European Medical Journal
  - ACS Nano
  - Cardiology
  - Journal of Tissue Engineering and Regenerative Medicine
  - The American Journal of Cardiology
  - Ultrasound in Medicine and Biology

- American Journal of Physiology Heart and Circulatory Physiology
- The Annals of Thoracic Surgery
- Journal of American Society of Echocardiography
- Annals of Biomedical Engineering
- Cardiovascular Engineering and Technology
- The Anatomical Record: Advances in Integrative Anatomy and Evolutionary Biology
- Microscopy and Microanalysis
- IEEE Transactions on Biomedical Engineering
- IEEE Transactions of Medical Imaging
- Applications and Applied Mathematics: An International Journal (AAM)
- Experiments in Fluids
- Echocardiography
- European Journal of Mechanics/B Fluids
- European Heart Journal Cardiovascular Imaging
- International Journal for Numerical Methods in Biomedical Engineering
- Journal of Biomechanics
- ASME Journal of Biomechanical Engineering
- Journal of American College of Cardiology, Imaging
- Mathematical Biosciences and Engineering
- Plos One
- Computers in Medicine and biology
- Computer Methods in Biomechanics and Biomedical Engineering
- Bioinspiration & Biomimetics
- Magnetic Resonance Imaging
- Cellular and Molecular Bioengineering
- Physics of Fluids
- Biomechanics and Modeling in Mechanobiology
- Computer Methods and Programs in Biomedicine
- Acta BioMaterialia

- Book Reviewer
  - Springer Cardiology
  - Elsevier
  - John Wiley & Sons Ltd
- University Service:
  - Member, UCI BME Award Committee, (2020-present)
  - Member, UCI's HSSoE's executive committee (2014-20)
  - Member, UCI's HSSoE's Research Committee (2018-19)
  - Advisor, National Society of Black Engineers, Chapter for University of South Carolina (2007-10)
  - Member of NSF-RII and NSF-FEI Faculty Search committees (2008-10)
  - Member Edwards Lifesciences Center' Director Search committee (2014-15)
  - Member of ELCACT faculty search committee
  - Member of BME Graduate Admission Committee
- Community service
  - Invited speaker, American Heart Association's Executive Breakfast (05/15/2018)
  - Invited speaker, American Heart Association fund raising event, *The Kings of Heart* (06/15/2016)
  - Invited speaker at the Caltech's Career in Medicine event, (05/06/2016)
  - Invited speaker at the American Heart Association fund raising event, *Cor Vitae* (06/04/2015)
- Consultant and Advisory Boards
  - *Ultrawave Labs, Inc* (2009- 2011)
  - *Siemens Healthcare* (2008-2010)

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- *Edwards Lifesciences*, (2004- 2011)
- *CalHealth, Inc,* (2014-2018)

- Founder and co-founder
  - *ENGcore, LLC (2008-13)*
  - *Folda, LLC (2010-18)*
  - *WALVE, Corp (2011-13)*
  - *Arash Kheradvar, LLC (2018-20)*
  - *ValVention, Inc (2018- present)*

Professional Memberships

- Fellow, American Institute of Medical and Biological Engineering
- Member, Society for Cardiovascular Magnetic Resonance
- Member, Society of Heart Valve Disease
- Member, American Physical Society
- Member, International Society for Applied Cardiovascular Biology (ISACB)
- Fellow, American Heart Association
- Member, Biomedical Engineering Society
- Member, Medical Image Computing and Computer Assisted Intervention Society (MICCAI)
- Member, American Society for Artificial Internal Organs
- Member, American Society of Echocardiography
- Member, Engineering in Medicine and Biology Society
- Member, Iranian Council of Medicine

Teaching

- University of California, Irvine, CA
  - BME110A: Biomechanics I
  - BME110B: Biomechanics II
  - BME110C: Biomechanics III
  - BME295/MAE295: Biofluid Mechanic
  - BME298/197A, B, C: Seminars in Biomedical Engineering
  - BME222: Biofluid Mechanic
  - BME195/295: Cardiovascular Devices
- University of South Carolina, Columbia, SC
  - BMEN211: Modeling and Simulation of Biomedical Systems
  - BMEN589a: Introduction to Cardiovascular Engineering
  - EMCH561a: Biofluid Mechanics
- GEM4 Summer School at Caltech, July 21-25, 2008
  - Summer 2008: Invited instructor: Mechanics of Heart Failure
- California Institute of Technology, Pasadena, California.
  - Summer 2007: Invited research mentor for Minority Freshman Summer Institute

Students and Scholars

Current

- Medical Students and residents
  - Sina Hosseinian
  - Adam Ratajczak (MD-PhD student)

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- Postdoctoral Scholars:
  - Mohammad S. Hashemi, Ph.D.
  - Yasaman Zamani, Ph.D.
  - Satya Prakash Pradhan, Ph.D.
- Scientists:
  - Melody, Toosky, Ph.D.
  - Farhad Sadeghi, Ph.D.
  - Mustafa N. Okur, Ph.D.
- Doctoral students:
  - Nnaoma Agwu, M.Sc.
  - Arash Dehghani

Alumni

- Medical Students and residents:
  - Peggy Bui, M.D., MBA (attending Physician, Medicine at UCSF)
  - S. Reed Plimpton, M.D. (currently a Radiology Chief Resident at UCLA)
  - Dean Spencer, M.D. (currently a fellow of Cardiothoracic surgery, Loma Linda Hospital)
- Undergraduate students:
  - Fernando Trinidad (Currently PhD student at UCI BME)
  - Patrick Lo (currently Staff R&D Engineer at Reflow Medical)
  - Zach Gyugyi (currently a Senior Engineering at Edwards Lifesciences)
  - Jason Burnside, M.Sc. (currently Global NPI Leader - Engineering Manager at GE Power)
  - Todd Gandy (currently a practicing pulmonary physician)
  - Matthew Hill (currently a Senior Sales Representative at Biomet)
  - Myra Robinson (currently Biostatistician at Levine Cancer Institute)
  - Erik Frankforter (currently Postdoctoral Researcher and Mechanical Engineer)
  - Brandon Dueitt (deceased)
  - Leila Nazemi (currently an EPM at Apple)
  - Sara Hariri, Ph.D. (currently a Scientist at Allergan).
  - Aimee Sanjose (currently Product Sustaining Engineer III at Alcon)
- Postdoctoral Scholars:
  - Yasaman Farsiani, Ph.D. (currently a Senior Engineer at Edwards Lifescience)
  - Maryam Pishgar, Ph.D. (currently a Lecturer of Industrial and Systems Engineering at USC)
  - Ahmed Elsaid, Ph.D. (currently an Assistant Professor of Computer Science and Engineering at University of North Carolina Wilmington)
  - Ramin Zareian, Ph.D. (currently a Senior Engineer at Medtronic)
  - Daisuke Morisawa, M.D., Ph.D. (currently an Assistant Professor of Cardiovascular Medicine at Hyogo College of Medicine)
  - S. Hamed Alavi, Ph.D. (currently a VP of R&D and Quality - enVVeno Medical Corporation)
  - Ahmad Falahatpisheh, Ph.D. (currently a Senior Principal Engineer at Synaptic Medical)
  - Elliott Groves, M.D., M.Sc. (currently, Assistant Professor and Director of Structural Heart Disease at University of Illinois at Chicago)
  - S Javid Moraveji, Ph.D.
  - Jan Mangual, Ph.D. (currently a Principal Scientist at Abbott)
  - Jimmy Su, Ph.D. (currently a Clinical Scientist at Philips)
  - Aditi Sinha, Ph.D. (currently a Manager, Global Regulatory Affairs at Onyx Pharmaceuticals, Inc)
  - Michael R. Avendi, Ph.D. (currently a Principal Data Scientist at Appriss)
- Graduate students:
  - Joseph Hariz, M.Sc. (Currently an Engineer at Edwards Lifesciences)
  - Kenneth Tang, M.Sc.
  - Paria Ali Pour, Ph.D. (currently a Clinical Research Scientist at Masimo)

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- Arghavan Arafati, Ph.D. (currently a Senior Applied ML Engineering at Edwards Lifesciences)
- Daryl C. Nguyen, M.Sc. (Engineer at ValVention Inc)
- Manoel Tamraz, M.Sc. (Solutions Engineering Analyst at Deloitte Consulting)
- Sam Zuke, M.Sc. (currently an Advanced Manufacturing Engineer at Medtronic)
- S Hamed Alavi, Ph.D. (currently a VP of R&D and Quality - enVVeno Medical Corporation)
- Ahmad Falahatpisheh, Ph.D. (currently a Senior Principal Engineer at Synaptic Medical)
- Pamela Botero, M.Sc. (visiting student; currently a graduate student at UCI)
- Mahsa Razaz Zadeh, M.Sc. (visiting student; currently a Senior Engineer at Confluent)
- Mindy Feng, M.Sc. (currently Engineering Manager at Wallaby Medical)
- Joshua Yu, M.Sc. (currently a Software Test Engineer at Hologic)
- Ege Alkan, M.Sc. (currently as Consultant Team Lead, AZZUR group)
- Ramses Trigo (Currently a Ph.D. Student at UC Irvine)
- Yuchen Jiang (Currently a Ph.D. Student at UC Irvine)