

Kerem Pekkan, PhD

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Professional Preparation:

- 2002-2004: Postdoctoral researcher, *Cardiovascular Fluid Dynamics*, Cardiovascular Fluid Dynamics Laboratory, School of Biomedical Engineering, Georgia Institute of Technology, Atlanta, GA, USA
- 2000-2002: Postdoctoral researcher, *Unsteady Propulsion Systems – Synovial Fluid Flow*, Innovative Propulsion Systems Laboratory, Department of Mechanical Engineering, Purdue University – Indiana University, Indianapolis, IN, USA
- 2000 Ph.D., Mechanical Engineering, *Computational Fluid Dynamics*, Middle East Technical University (METU), Ankara, Turkey; Thesis: “Development of a Cartesian Grid Moving Boundary Euler Solver with Applications to Transient Axisymmetric Internal Flows”
- 1995 M.S., Mechanical Engineering Department, *Experimental Fluid Dynamics*, METU, Ankara, Turkey; Thesis: “Computer Aided Design, 5-axis Machining and Performance Tests of Centrifugal Pump Impellers”
- 1992 B.S., Mechanical Engineering Department (7th out of the class of 256), *Thermo-Fluids and Design*, METU, Ankara, Turkey

Appointments:

- 2007- ... Assistant Professor, Mechanical Engineering, CMU (courtesy appointment)
- 2007- ... Assistant Professor, Biomedical Engineering, CMU, Pittsburgh, PA
- 2005-2007: Research Assistant Professor, School of Biomedical Engineering, Georgia Tech, Atlanta, GA
- 1995-2000: Propulsion System Design Engineer, R&D Department, Roketsan Inc., Ankara, Turkey
- 1992-1995: Teaching Assistant, Mechanical Engineering Department, METU, Ankara, Turkey

Honors:

- 2009: Invited Talk, 5th Pediatric Mechanical Circulatory Support Systems Conference, Dallas
- 2005: Prof. Dr. -Ing. Helmut Reul Young Investigators Award
- 2005: Session Chair: Hemodynamics APS Division of Fluid Dynamics 58th Annual Meeting, Chicago
- 2004: Invited Talk, Biomedical Engineering Society (BMES) Annual Fall Meeting, Philadelphia

Service:

Member, NSF panels since 2007, American Heart Association study section since 2008

Selected Relevant Publications:

1. Pekkan K, Dasi LP, de Zélicourt D, Sundareswaran KS, Fogel MA, Kanter KR, Yoganathan AP. Hemodynamic Performance of Stage-2 Univentricular Reconstruction: Glenn vs. Hemi-Fontan Templates. *Annals of Biomedical Engineering*, Ann Biomed Eng, 37(1):50-63, 2009
2. Pekkan K, Dur O, Sundareswaran K, Kanter K, Fogel M, Yoganathan A, Undar A. Neonatal aortic arch hemodynamics and perfusion during cardiopulmonary bypass. *Journal of Biomechanical Engineering*, Dec;130(6):061012, 2008
3. Pekkan K, Dasi LP, Nourparvar P, Yerneni S, Tobita K, Fogel MA, Keller B, Yoganathan A. In vitro hemodynamic investigation of the embryonic aortic arch at late gestation. *Journal of Biomechanics*, 41(8):1697-706, 2008
4. Wang C, Pekkan K, de Zélicourt D, Parihar A, Kulkarni A, Horner M, Yoganathan AP, Progress in the CFD Modeling of Flow Instability in Anatomical Total Cavopulmonary Connections, *Annals of Biomedical Engineering*, Nov;35(11):1840-56, 2007. (Results featured on the cover illustration)
5. Zélicourt D., Pekkan K., Parks WJ, Kanter K., Fogel M., Yoganathan AP, Flow study of an extra-cardiac connection with persistent left superior vena cava, *The Journal of Thoracic and*

Cardiovascular Surgery, Volume 131, Number 4, pp. 785-791, 2006. (Results featured on the cover illustration)

6. Nalim R., Pekkan K., Sun H. B., Yokota H., Oscillating Couette Flow for in vitro Cell Loading, *Journal of Biomechanics*, Vol.37, Issue 6, pp. 939-942, 2003.
7. Pekkan K., Kitajima H., Forbess J., Fogel M, Kanter K., Parks J.M., Sharma S., Yoganathan A. P., Total Cavopulmonary Connection Flow with Functional Left Pulmonary Artery Stenosis – Fenestration and Angioplasty in Vitro, *Circulation*, Vol 112, Issue 21, pp. 3264-71, 2005.
8. Whitehead KK, Pekkan K., Kitajima H, Paridon S, Fogel M, Yoganathan A, Non-Linear Power Loss During Exercise in Single Ventricle Patients After the Fontan: Insights From Computational Fluid Dynamics, *Circulation*, 11:116(11 Suppl):I165-71, 2007

Other Selected Publications:

9. Pekkan K., Whited B, Kanter K, Sharma S, de Zelicourt D, Sundareswaran K, Frakes D, Rossignac J, Yoganathan AP. Patient-specific surgical planning and hemodynamic computational fluid dynamics optimization through free-form haptic anatomy editing tool (SURGEM), *Medical & Biological Engineering & Computing*, Nov;46(11):1139-52, 2008
10. Krishnankutty R, Dasi LP, Pekkan K., Sundareswaran K, Fogel MA, Sharma S, Kanter K, Yoganathan AP, Quantitative analysis of extra-cardiac vs. intra-atrial Fontan anatomic geometries, *The Annals of Thoracic Surgery*, 85(3):810-7, 2008.
11. Liu Y., Pekkan K., Jones C., Yoganathan A. P., The Effects of Different Mesh Generation Methods on Fluid Dynamic Analysis and Power Loss in Total Cavopulmonary Connection (TCPC), *Journal of Biomechanical Engineering*, Vol. 126, Issue 5, pp. 594-603, 2004.
12. Pekkan K., Zelicourt D., Ge L., Sotiropoulos F., Frakes D., Fogel M., Yoganathan A. P., Flow Physics Driven CFD Modeling of Complex Anatomical Flows. -A TCPC Case Study, *Annals of Biomedical Engineering*, Vol. 33, Issue 3, 2005.
13. Frakes, D., Smith, M.J.T., Pekkan, K., Zelicourt D., Yoganathan, A. P., A New Adaptive Method for Registration-Based Medical Image Interpolation, *IEEE Transactions on Medical Imaging*, 27(3):370-7, 2007.
14. Soerensen D, Pekkan K., de Zélicourt D, Parks J, Kanter K, Fogel M, Yoganathan AP, Introduction of a New Optimized Total Cavopulmonary Connection, *The Annals of Thoracic Surgery*, Jun;83(6):2182-90, 2007.

Synergistic Activities:

1. Outreach activities are organized involving science teachers (from suburban, rural and urban Pittsburgh schools) on Biomedical Engineering
2. Developed experimental fluid dynamics and cardiovascular flow visualization lectures for undergraduate/graduate biofluids courses at Georgia Tech.
3. Supervised several Undergrad and K-12 Students in educational research projects related to propulsion and cardiovascular engineering during academic/industrial appointments.
4. Developed a summer graduate/undergraduate course *Applied Computational Fluid Dynamics* in 2002. (Steven Valandingham, received the undergraduate research award through his work on CFD design of race cars)

Collaborators & Other Affiliations:

- (a) *Collaborators:* Ajit Yoganathan, Jarek Rossignac; Georgia Institute of Technology. Bradley Keller, Curt de Groff, Ann Anderson; University of Pittsburgh. James Antaki, Amit Acharya, Metin Sitti, Philip Leduc, Burak Ozdoganlar, Levent Burak Kara, Ender Finol, Carnegie Mellon University. Mark Fogel, Akif Undar; University of Pennsylvania. Kirk Kanter, Emory University
- (b) *Graduate Advisor:* Middle East Technical University, Turkey: Ahmet Ucer
- (c) *Post-doc Mentors:* Georgia Institute of Technology: Ajit Yoganathan, Purdue University: Razi Nalim
- (d) *Thesis Advisees: Graduated:* Basar Seckin (MSc,01), Berrak Alparslan (MSc,02), Diane deZelicourt (MSc,05), Denis Soerensen (MSc,05), Yajuan Wang (MSc, 08)