

Department of Mechanical Engineering

William Maxwell Reed Seminar Series

Utilizing Experimental and Computational Tools in Tandem for Development and Evaluation of Cardiovascular Devices

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Abstract: Since Andreas Vesalius first described the mitral valve in 1543, detailed investigations have established an intuitive approach to increase the biomechanical understanding of the valve and provide a rational basis for innovative repair and replacement strategies. The mitral valve apparatus is one of the most complex cardiac structures, operating under high pressures. Repair is currently favored over replacement in almost all mitral valve pathologies requiring surgical intervention. However, this advantage is contingent upon competent procedures and repair devices, which is of paramount significance to long term success. Increasing repair durability requires diligent restoration and support of the valve, re-establishing the natural biomechanics.

This presentation summarizes development of procedures to enhance mitral valve repair devices and techniques from a rational standpoint to support the on-going improvement efforts. The focus is on providing experimentally derived boundary conditions to construct and validate computational biomechanical models of the left heart and the mitral valve. Part of this work has already been adopted internationally by industry for mitral valve repair devices, which can ultimately improve the lives of people with heart valve deficiencies.

Bio: Dr. Jensen earned his BS in Electrical and Computer Engineering from the University of Aarhus, Denmark, MS in Biomedical Engineering from Georgia Tech/Emory University, PhD in Medicine from the University of Aarhus, Denmark, and DrMed from the University Hospital of Aarhus, Denmark. After six years with National Instruments (Austin, TX) in the Consulting Services and Business Development groups, Dr. Jensen relocated to Denmark and was appointed as an assistant and associate professor at the Dept. of Biomedical Engineering and Cardiothoracic & Vascular Surgery at the University Hospital of Aarhus, Denmark from 2007-12. He has since then worked with the London Heart Hospital (London, UK), the Department of Mechanical Engineering at UCL (London, UK) and the Department of Biomedical Engineering at Georgia Tech (Atlanta, GA). Dr. Jensen was appointed as an Associate Professor of Biomedical Engineering and Arkansas Research Alliance Scholar at the University of Arkansas in 2015, with research focusing on biomechanics in experimental cardiovascular surgery. He teaches engineering courses in the fields of hemodynamics, cardiovascular modeling, biomechanics, medical instrumentation and virtual instrumentation. The results obtained from his research are currently used in FDA guidelines for heart repair devices. He is appointed to the Danish Academy of Engineers and has won several prizes for his work. He also held the position as Director of Research for The Scandinavian School of Cardiovascular Technology and previously served on the Board of Directors at the Danish Society for Biomedical Engineering and the Danish Cardiovascular Research Academy. Dr. Jensen has authored and co-authored 42 peer reviewed journal articles, 124 conference presentations, 8 book chapters, 17 magazine articles, 27 seminars and 3 patents.

Date: December 9, 2016
Place: CB 106

Time: 3:00p to 4:00p
Contact: Dr. Alexandre Martin 257-4462

Meet the speaker and have refreshments
Attendance open to all interested persons