

## I. Introduction

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### **Biographical Narrative**

Lakshmi Prasad Dasi, Ph.D., is an established researcher in the field of prosthetic heart valves, cardiovascular biomechanics, biomaterials, and devices. He is a tenured Full Professor of Biomedical Engineering at the Department of Biomedical Engineering, Georgia Institute of Technology (effective Jan 1 2020). Prior to this, he was a tenured Full Professor of Biomedical Engineering, of Surgery, and of Physiology and Cell Biology at The Ohio State University. He is also Affiliate Faculty, Center for Cardiovascular Research, Nationwide Children's Hospital Research Institute; and at the School of Biomedical Engineering of Colorado State University. Prof. Dasi earned his Ph.D. from Georgia Institute of Technology in 2004 with a focus in fluid dynamics and turbulence. He trained as a postdoctoral fellow and research engineer under Prof. Ajit Yoganathan's mentorship at Georgia Tech where he transformed his research focus to heart valves, devices, and cardiovascular biomechanics. In 2009, he established the Cardiovascular Biofluid Mechanics Lab (CBFL) as Assistant Professor at Colorado State University and moved to The Ohio State University in 2015 as his focus became more translational. Since then, his research has focused on tackling the complexity of: (a) heart valve biomechanics (native and prosthetic); (b) prosthetic heart valve engineering (conventional & trans-catheter); (c) structure-function relationships of the heart in health and disease at the embryonic, pediatric, as well as adult stages; and (d) turbulence and turbulent blood flow. To date, Dr. Dasi's work has resulted in over 80 peer-reviewed journal publications and over 175 conference proceedings in the areas of mechanics and cardiovascular research. As an example of the depth and breadth of his research contributions, overall publications tackle: (1) understanding the vortex dynamics of native heart valves, and the impact of coronary flow, (2) formulation of a theory to predict mechanical loading on blood cells in turbulent flows, (3) impact of altered mechanics as epigenetic factors during embryonic heart development, (4) quantification of the thrombo-embolic potential of prosthetic heart valves using Lagrangian blood damage indices, (5) patient specific interactions of trans-catheter aortic valves, (6) unification of energy based clinical indices for multiple heart valve diseases, and (7) the fundamental structure of turbulent flows. All of these contributions either led to, or are a product of highly competitive national level research grants from the National Institutes of Health (NIH), National Science Foundation (NSF), and American Heart Association (AHA). Dr. Dasi has been Principal Investigator of grants totaling to over \$6M in funding with an additional \$7M in federal funding (as PI) currently pending to further broaden the scope of research undertaken by CBFL into the new area of personalized trans-catheter heart valve engineering. Dr. Dasi has 8 patents and is actively involved in commercialization of his recent technologies dealing with trans-catheter heart valves as well as predictive computational models for trans-catheter aortic valve therapy. Dr. Dasi is also involved in international partnerships with the goal of developing low cost heart valves in low-resource countries and has received special funding from the NIH as well as Indian government in this effort. Overall

Dr. Dasi's research lab has trained 8 Ph.D. students (4 graduated), and 4 post-docs in addition to undergraduate students. Dr. Dasi has received several awards including the Melissa G. Piper Distinguished Mentor Award, George T. Abell Outstanding Teaching & Service Faculty Award, George T. Abell Outstanding Early-Career Faculty Award, and the American Heart Association's National Scientist Development Award. Dr. Dasi also serves on the editorial board of the Annals of Biomedical Engineering in addition to serving as reviewer on NIH, AHA, and NSF grant study section/panels in addition to international funding agencies. He actively organizes symposiums and sessions related to heart valve engineering at national and international meetings such as at the World Congress of Biomechanics, Summer Biomechanics, Bioengineering, and Biotransport Conference, Heart Valve Society, and the U.S. National Congress for Theoretical and Applied Mechanics..

### **Current Appointments**

- 08/2020 - Present Associate Chair for Undergraduate Studies, Georgia Institute of Technology, Biomedical Engineering, United States
- 01/2020 - Present Professor, Georgia Institute of Technology, Biomedical Engineering, United States

### **Academic Appointments**

- 2015 - 05/2019 Associate Professor, The Ohio State University, Biomedical Engineering, United States
- 2015 - 05/2019 Associate Professor (courtesy), The Ohio State University, Surgery, United States
- 2015 - 05/2019 Associate Professor (courtesy), The Ohio State University, Physiology & Cell Biology, United States
- 2015 - 2015 Associate Professor, Colorado State University, Mechanical Engineering, United States
- 2015 - 2015 Associate Professor and Core Faculty Member, Colorado State University, School of Biomedical Engineering, United States
- 2009 - 2015 Assistant Professor, Colorado State University, Mechanical Engineering, United States
- 2009 - 2015 Assistant Professor and Core Faculty Member, Colorado State University, School of Biomedical Engineering, United States

### **Other Appointments**

- 2005 - 2009 Research Engineer – I, Department of Biomedical Engineering, Georgia Institute of Technology, United States
- 2005 - 2009 Gandy-Diaz Teaching Fellow (2006-2007) in the Department of Biomedical Engineering Georgia Institute of Technology, United States
- 2004 - 2005 Postdoctoral Fellow, Department of Biomedical Engineering, Georgia Institute of Technology, United States
- 2003 - 2004 Graduate Research Assistant, Department of Civil & Environmental Engineering, Georgia Institute of Technology, United States
- 2001 - 2003 Graduate Teaching Assistant (CEE4200 Hydraulic Engineering 2001-2002; CEE6251 Fluid Mechanics Fall 2003; CEE6263 Fluid Mechanics of Organisms Fall 2002), Department of Civil & Environmental Engineering, Georgia Institute of Technology, United States

1999 - 2001 Tutor/Mentor at Office of Minority Education (OMED) Educational Services, Georgia Institute of Technology, United States

1999 - 2001 Graduate Research Assistant, Department of Civil & Environmental Engineering, Georgia Institute of Technology, United States

1999 Library Shelver, Jacob Burns Law Library, George Washington University, United States

### **Degrees**

August 2000 - December 2004 PhD, Georgia Institute of Technology, Civil and Environmental Engineering.

January 1999 - July 2000 MS, Georgia Institute of Technology, Civil and Environmental Engineering.

August 1994 - July 1998 BTech, Indian Institute of Technology, Civil Engineering.

### **Fellowships, Internships, Residency**

None

### **Certifications**

July 2018 I-Corps@Ohio: Ohio Department of Higher Education

### **Licensures**

None

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