

Lakshmi Prasad Dasi, PhD, FACC, FAIMBE
Rozelle Vanda Wesley Professor
Associate Chair for Undergraduate Studies
Wallace H. Coulter Department of Biomedical Engineering
Georgia Institute of Technology and Emory University

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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 currently a tenure Professor of Biomedical Engineering, at Georgia Institute of Technology while holding the Rozelle Vanda Wesley Endowed Professorship as well as being the Associate Chair for Undergraduate Studies. He has held positions at The Ohio State University, and Colorado State University previously. He is a Fellow of the American College of Cardiology (FACC) as well as Fellow of the American Institute for Medical and Biological Engineering (FAIMBE).

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 2020, his research at Georgia Tech focuses 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 100 peer-reviewed journal publications and over 300 conference proceedings in the areas of mechanics and cardiovascular research. His scholarly impact is highly clinical and translational in nature, based on new knowledge pertaining to cardiovascular diagnostics and devices for adults and children. Some noteworthy translational accomplishments include: (1) enabling a precision medicine based trans-catheter valve replacement paradigm, and (2) development of low-cost polymeric heart valve technologies for the developing world and the US. Both of these have translated into two promising startups (one in Ohio as Dasi Simulations LLC and another in Georgia as YoungHeartValve Inc). All of these contributions and impact 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 \$15M in funding with an additional \$7M in federal funding (as PI) currently pending to further broaden the scope of research

undertaken by the lab into the new area of personalized trans-catheter heart valve engineering. Dr. Dasi has 9 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.

In addition to being elected to ACC and AIMBE, 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 & Emory University, Biomedical Engineering, United States
01/2020 - Present	Professor, Georgia Institute of Technology & Emory University, Biomedical Engineering, United States
12/2019 - Present	Co-Founder and CTO, Dasi Simulations LLC, Dublin OH, United States
02/2019 - Present	Co-Founder and CTO YoungHeartValve Inc, Atlanta GA, United States

Academic Appointments

05/2019-12/2019	Professor and interim Associate Chair, The Ohio State University, Biomedical Engineering, United States
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
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Licensures

None

I. Core Dossier

Teaching

1) Undergraduate, graduate, and professional courses taught

Period Offered	Course Number and Title (Credit Hours)	Enr.	% Taught, Role	Stdnt Eval.	Peer Eval.	Other Eval.	Instr. Method
Spring 2023	BMED 3310 Biotransport	>100	Instructor	Yes	No	No	Didactic / Lecture
Fall 2021	BMED 3310 Biotransport	>100	Instructor	Yes	No	No	Didactic / Lecture
Spring 2021	BMED 3310 Biotransport	>100	Instructor	Yes	No	No	Didactic / Lecture
Autumn 2018	BIOMEDE 4410 Biomechanics (3)	15	100 Instructor	Yes	No	No	Didactic / Lecture
Spring 2018	BIOMEDE 5194 Cardiovascular Biofluid Mechanics (3)	9	100 Instructor	Yes	Yes	No	Didactic / Lecture
Spring 2017	BIOMEDE 8811 Biomedical Engineering Seminars (1)	30	100 Instructor	Yes	No	No	Didactic / Lecture
Autumn 2016	BIOMEDE 8811 Biomedical Engineering Seminars (3)	34	100 Instructor	Yes	No	No	Didactic / Lecture
Autumn 2016	BIOMEDE 4410 Biomechanics (3)	34	100 Instructor	Yes	No	No	Didactic / Lecture
Spring 2016	BIOMEDE 5194 Cardiovascular Biofluid Mechanics (3)	8	100 Instructor	Yes	No	No	Didactic / Lecture
Spring 2015	BIOM300 Problem Based Learning Lab (4)	40	100 Instructor	Yes	No	No	Didactic / Lecture
Spring 2015	MECH539 Advanced Fluid Mechanics (3)	21	100 Instructor	Yes	No	No	Didactic / Lecture
Autumn 2014	MECH342 Mechanics and Thermodynamics of Flow Processes (Honors) (3)	12	100 Instructor	Yes	No	No	Didactic / Lecture
Spring 2014	BIOM300 Problem Based Learning Lab (4)	21	100 Instructor	Yes	No	No	Didactic / Lecture
Spring 2014	MECH539 Advanced Fluid Mechanics (3)	22	100 Seminar Organizer	Yes	No	No	Didactic / Lecture
Spring 2013	MECH539 Advanced Fluid Mechanics (3)	11	100 Seminar Organizer	Yes	No	No	Didactic / Lecture

Spring 2013	MECH342 Mechanics and Thermodynamics of Flow Processes (3)	55	100 Instructor	Yes	No	No	Didactic / Lecture
Autumn 2012	MECH338 Thermodynamics Lab (1)	58	100 Seminar Organizer	Yes	No	No	Didactic / Lecture
Autumn 2012	BIOM570 Bioengineering (3)	13	100 Seminar	Yes	No	No	Didactic /

			Organizer				Lecture
Spring 2012	BIOM581/MECH543 Biofluid Mechanics (3)	9	100 Seminar Organizer	Yes	No	No	Didactic / Lecture
Spring 2012	MECH539 Advanced Fluid Mechanics (3)	18	100 Instructor	Yes	No	No	Didactic / Lecture
Autumn 2011	MECH342 Mechanics and Thermodynamics of Flow Processes (Honors) (3)	18	100 Instructor	Yes	No	No	Didactic / Lecture
Autumn 2011	MECH338 Thermodynamics Lab (1)	33	100 Seminar Organizer	Yes	No	No	Didactic / Lecture
Autumn 2011	BIOM570 Bioengineering (3)	14	100 Seminar Organizer	Yes	No	No	Didactic / Lecture
Spring 2011	MECH565 - Solar and Alternative Energies- 3 Lectures only) (3)	13	100 Instructor	Yes	No	No	Didactic / Lecture
Spring 2011	BIOM570 Bioengineering (3)	20	100 Instructor	Yes	No	No	Didactic / Lecture
Autumn 2011	MECH342 Mechanics and Thermodynamics of Flow Processes (Honors) (3)	8	100 Instructor	Yes	No	No	Didactic / Lecture
Autumn 2010	MECH539 Advanced Fluid Mechanics (3)	9	100 Instructor	Yes	No	No	Didactic / Lecture
Spring 2010	BIOM581/MECH543 Biofluid Mechanics (3)	5	100 Instructor	Yes	No	No	Didactic / Lecture
Spring 2010	MECH342 Mechanics and Thermodynamics of Flow Processes (3)	28	100 Instructor	Yes	No	No	Didactic / Lecture
Summer 2009	BMED1300 Problem Based Learning (3)	12	100 Instructor	Yes	No	No	Didactic / Lecture
Spring 2007	BMED1300 Problem Based Learning	8	100 Instructor	Yes	No	No	Didactic / Lecture
Autumn 2006	BMED4757 Biofluid Mechanics (3)	25	100 Instructor	Yes	No	No	Didactic / Lecture

2) Involvement in graduate/professional exams, theses, and dissertations, and undergraduate research

A major aspect of my academic duties is the advising of graduate and undergraduate students. Here the goal is the train students in the cutting edge areas of research while helping them to become potential

future leaders by developing their organization skills, communication skills, as well as independent thinking. My lab works as a focused group of students because the learning is more productive and insightful as a group, particularly one that is multi-cultural, international, and with minorities. There are roughly between six to eight graduate students in my group (on average) including international, minority, and non-traditional students. I believe that a group with such diverse backgrounds helps generate transformative ideas. We have structured weekly meetings to facilitate interaction, including a journal club in addition my student specific interactions catered for each student individually.

At the Masters level, I have designed short research projects that a student can tackle within a 1-2 year time period. These projects help the student take their first independent research step by helping them formulate their own research topic as an original contribution and developing the appropriate experimental model. I strongly motivate students with the prospect of publishing their work and potentially continuing at the doctoral level or join Industry. I have advised a number of students both at CSU and OSU. These students work beside doctoral students and have been an integral part of my lab.

Doctoral students have been at the heart of my lab who are a vibrant team of students who share the common passion of pursuing high-impact research in fluid mechanics and cardiovascular biomechanics. During the course of their training, students attend weekly meetings with me and bi-weekly meetings with our collaborators at the Wexner Medical Center Hospital or Nationwide Childrens or Colorado State University (via telecom) to discuss research progress. Together, these collaborators broaden students' knowledge as well as highlight the importance of teamwork and think more broadly. Regular group meetings are held where group members can interact, exchange ideas and brainstorm solutions to difficulties. These meetings train the students to think broadly, and sharpen their problem solving skills. Further, all students are involved in Journal club presentations, which are an exercise for my group members to develop the skills to critically analyze peer-reviewed technical papers by studying them with me. At the beginning of each semester, doctoral students are expected to develop a project plan with defined objectives, deadlines, deliverables and budget for that semester. At the end of the semester, student is expected to give a detailed presentation and written report on his/her accomplishments with a thorough self-assessment. As part of my training philosophy, a doctoral student is expected to publish at least three peer-reviewed publications in coveted journals. Students are encouraged and provided with opportunities to present his/her findings at national and international scientific meetings. These conferences allow students to interact with other researchers and further develop their skills to present / market his/her research findings. All of the writing and oral presentations help train my students in communication skills that are critical to their professional development and success. Doctoral students also have the opportunity to mentor undergraduate research assistants, so they will be ready to mentor students in their future academic career.

a) Graduate Students: Number Completed and Number Current

Category	Current	Complete
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i) Doctoral Students (Dissertation Advisor)	12	5
ii) Doctoral Students (Dissertation Committee Member)	3	5 (CSU)
v) Master's Students (Thesis Advisor)	0	12
vii) Master's Students (Thesis Committee Member)	0	5 (CSU)
Totals	8	25

i) Doctoral Students (Dissertation Advisor)

2023 – Present Venkatesh, Aniket. Computational modeling for aortic valve disease. Georgia Tech/Emory.

2023 – Present Ream, Courtney. Computational modeling for mitral/tricuspid disease. Georgia Tech/Emory.

2022 – Present Mata Quinonez, Luis Rene. Computational modeling for Coronary Disease. Georgia Tech/Emory.

2021 – Present Karnik S. Novel flexible blade LVAD. Georgia Tech/Emory.

2021 – Present Song W. AI/ML modeling of post surgical hemodynamics Georgia Tech/Emory.

2021 – Present Harris J. 3D printing mitral valve. Georgia Tech/Emory.

2021 – Present Joshi S. Polymeric pulmonary conduits. Georgia Tech/Emory.

2020 – Present Bhat S. Fetal and Pediatric Heart valves. Georgia Tech/Emory.

2020 – Present Shah I. Reduced order models for predictive modeling of trans-catheter valves. Georgia Tech/Emory.

2019 – Present Yeats B. Towards Patient Prosthetic Heart valves. Georgia Tech/Emory.

2018 – Present Sivakumar S. Computational modeling of trans-catheter valves. Georgia Tech/Emory.

2019 – Present Gooden S. Computational modeling of trans-catheter valves. Georgia Tech/Emory.

2017 –2020 Heitkemper M. Advanced flow controlled polymeric heart valves. The Ohio State University. (Transitioned advisorship to Dr. Breuer, Nationwide Childrens).

2015 - 2018 Hatoum H. Fluid Mechanics of Transcatheter Aortic Valve Replacement. The Ohio State University. Current Positions: Postdoctoral Researcher

2012 - 2015 Moore B. Regulation of Aortic Valve Sinus Hemodynamics by Anatomic Factors and Coronary Flow. Colorado State University. Graduated: 2015. Current Positions: Industry Researcher

- 2010 - 2014 Johnson B. Embryonic cardiac biomechanics and the role of mechanics on congenital defect formation. Colorado State University. Graduated: 2014. Current Positions: Industry Researcher
- 2009 - 2014 Forleo M. Time resolved particle image velocimetry analysis of bileaflet heart valves. Colorado State University. Graduated: 2014. Current Positions: Academic Researcher
- 2010 - 2014 Morshed N. Phenomenology of anisotropic turbulence. Colorado State University. Graduated: 2014. Current Positions: Industry Researcher

ii) Doctoral Students (Dissertation Committee Member)

- 2019 Farzadi A. The Ohio State University, Columbus, OH
- 2018 Rodriguez J. The Ohio State University, Columbus, OH
- 2018 Kanghyun K. The Ohio State University, Columbus, OH

v) Master's Students Plan A (Thesis Advisor)

- 2022 - present Matthew Gunther .Automatic segmentation of mitral valve from TEE. Georgia Institute of Technology.
- 2022 - present Aniket Venkatesh. Automatic thrombosis risk assessment for TAVR. Georgia Institute of Technology.
- 2020 - 2022 Beom Jun Lee. Artificial intelligence-based patient-specific reconstruction of aortic root in transcatheter aortic valve replacement patients. Georgia Institute of Technology.
- 2017 - 2018 Shelley Gooden. In-vitro modeling of Mitra-clip repair for Mitral Regurgitation. The Ohio State University.
- 2016 – 2020 Flemister D. 3D tissue engineered modeling of aortic valves. The Ohio State University.
- 2017 - 2018 Michael Mastran. Trileaflet Mechanical Heart Valve Prosthesis. The Ohio State University.
- 2015 - 2018 Amir Azimian. Computational modeling of trans-catheter heart valve therapy. The Ohio State University. Graduated: 2018.
- 2014 - 2015 Ryan Oba. Development of bioreactor for aortic valve mechanobiology. The Ohio State University. Graduated: 2018.
- 2013 - 2015 Banefshah Zebhi. Hemodynamic and anatomic correlates of calcific aortic valve disease: image based analysis of lesions. Colorado State University. Graduated: 2015.
- 2013 - 2014 Alexander Bulk. Embryonic cardiovascular biomechanics. Colorado State University. Graduated: 2015.
- 2011 - 2013 Evan Koenig. In-vitro study of trans-catheter mitral valve prosthesis. Colorado State University. Graduated: 2014.
- 2009 - 2011 Haiming Tan. Lumped parameter modeling of multiple heart valve disease and cardiac energetics. Colorado State University. Graduated: 2013.
- 2009 - 2011 Canek Philips. A simple lumped parameter model of the cardiovascular system. Colorado State University. Graduated: 2011.

2009 - 2011 Brandon Moore. Effects of structure on flow mechanics in the human left ventricle and respiratory tract. Colorado State University. Graduated: 2011.

2009 - 2011 Kevin Migita. Design and fabrication of a flow chamber for the study of cell adhesion and hemocompatibility in dynamic conditions. Colorado State University. Graduated: 2011.

2009 - 2010 Jennifer Serrao. Colorado State University. Graduated: 2010.

vi) Undergraduate Student Advising

2018 - 2018 Breandon Yeats – Developing computational models for heart valve engineering. The Ohio State University.

2017 - 2019 Tori Burton – Developing polymeric heart valves. The Ohio State University.

2017 - 2018 Kunal Gupta – Processing patient CT angiography data. The Ohio State University.

2015 - 2018 Ian May – Statistical analysis the small scale structure of fluid turbulence. Colorado State University.

2014 - 2015 Hannah Mikelson – Developing electrical impedance tomography device specifically for aortic valve imaging. Colorado State University.

2013 - 2015 Lane Taylor – Prosthetic heart valve design and energy loss characterization Colorado State University.

2013 - 2014 Joslyne Lovelace – Nitinol Stents for transcatheter aortic valves. Colorado State University.

2011 - 2013 Jennifer Vaughn – Developing a Novel Low Cost Heart Valve Fatigue Tester – Honors Thesis May 2013. Colorado State University.

2009 - 2011 Evan Siebenmorgen – Modeling calcific aortic valve ideas in fresh pig hearts. Colorado State University.

2009 - 2011 Rachael Simon, Denver Metropolitan, Undergraduate American Heart Association Fellow. Colorado State University.

2009 - 2011 Eric Dishinger – Honors Thesis in Mechanical Engineering. Colorado State University. Graduated: 2011.

2009 - 2011 Stephanie Jebson – Development of a beating cadaver heart simulator. Colorado State University

b) Describe any noteworthy accomplishments of graduate students for whom you have been the advisor of record, for example, publications during or emanating from graduate program, awards for graduate work, prestigious post-docs or first post-graduate positions.

I have graduated a total of five doctoral students. All of the doctoral students have been first authors in conference and journal publications since 2011. Megan Heitkemper received the ICorps Ohio grant as Entrepreneurial Lead. Hoda Hatoum received the prestigious Presidential Graduate Fellowship and has published over 20 first authored papers. Hoda Hatoum received the BMES Early Career Development Award for the 2019 meeting. Megan Heitkemper received the Diversity Travel award to present at the 2018 World Congress of Biomechanics, Dublin Ireland, while Dormal Flemister and Hoda Hatoum were runners-up (towards being finalists) in the PhD student paper competition at the same meeting. Dormal Flemister also received the diversity travel award to present at the 2017 SB3C (Summer Biomechanics,

Bioengineering, and Biotransport Conference) in Tucson, Arizona. Marcio Forleo won the NSF AGEP minority fellowship award and is now currently industry researcher at Gore Biomedical Inc. Brandon Moore received the best teaching assistant award at Colorado State University.

c) Undergraduate Research Mentoring

I have always served as undergraduate research mentor since 2009. Undergrads bring highly enthusiastic energy into the lab and are the ideal people to undertake risky and high reward research activities. I usually recruit these students through senior design teams or through the undergraduate classes that I teach. Some of my undergraduate research students have presented at national conferences

d) Describe any noteworthy accomplishments of undergraduate students, in particular related to research, for whom you have been the advisor of record (publications, posters, honors or student awards).

Rachael Simon was an undergrad from Denver Metropolitan, who won the Undergraduate American Heart Association Fellow twice in Summer 2012 and 2013. Ian May presented an oral talk at the American Physical Society (Division of Fluid Dynamics) conference on turbulent flows in 2014. Melody Dong (a high-school student) presented a poster at the American Physical Society (Division of Fluid Dynamics). Rachael Simon presented a poster at the American Society of Mechanical Engineers annual meeting in 2012. In 2019, Tori Burton won 2nd place in the undergraduate poster competition at SB3C 2019.

3) Involvement with Postdoctoral Scholars and Researchers

I have been involved in the advising of following postdocs.

1. Dr. Thangam Natarajan (PhD) (6/2022-present) – Studying advanced biomaterials on prosthetic heart valves.
2. Dr. Huang Chen (PhD) (12/2019-present) – 3D particle image velocimetry and computational registration techniques.
3. Dr. Satheesh Harikrishnan (PhD) (01/2022-present) – Studying fluid dynamics of heart valves.
4. Dr. Roya Kamali (PhD) (08/2021-02/2022) – Fluid mechanics and modeling of flow diverter in aneurysm. Currently at Abbott.
5. Dr. Milad Samaee (PhD) (1/2020-12/2022) – Studying transcatheter heart valve mechanics and BT-shunt device. Currently at Medtronic.
6. Dr. Atefeh Razavi (PhD) (10/2020-08/2022) – Studying anomalous coronary artery physiology. Currently at Edwards Lifesciences.
7. Dr. Fateme Esmailie (PhD) (12/2020-08/2022) – Studying machine learning applications in heart valve predictive modeling. Currently Assistant Professor at University of Northern Texas.

8. Dr. Yasaman Farsiani (PhD) (10/2020-03/2022) – Experimental modeling of anomalous coronary artery physiology. Currently at University of Irvine, CA.
9. Dr. Hieu Bieu (PhD) (8/2019-2022) – Studying advanced biomaterials on prosthetic heart valves. Currently independent consultant.
10. Dr. Hoda Hatoum (PhD) (9/2018-8.2020) – Studying superhydrophobic and vortex generator controlled heart valves. Currently Assistant Professor at Michigan Tech.
11. Dr. David Bark (PhD) (11/2013-8/2015) – Studying prosthetic heart valve design parameters and hemodynamics in relation to fatigue and thrombosis characteristics. Currently Assistant Professor at Washington University.
4. Dr. Marcio Forleo (PhD) 8/2014-12/2014 – Assisting in particle image velocimetry studies for textile and polymeric heart valves. Currently Industry researcher.
5. Dr. Neil Stafford (MD) (1/2013-5/2014) – Embryonic cardiac biomechanics and the role of mechanics on congenital defect formation. Currently Assistant Professor (Clinical) at Duke University.
6. Dr. Pablo Maureira (MD/PhD) (11/2013-7/2014) – Studying transcatheter aortic and mitral valve replacement devices. Currently Department Chair of Cardiac Surgery in University Hospital of Nancy, France.

Postdocs are involved with the future research direction of the lab by being involved in grant proposal writing as well as new research study designs. They also help mentor all graduate students in the lab by being positive role models as well as by being involved in day to day research tasks. In addition, postdocs also undergo the same training as with doctoral students with respect to meetings, journal clubs, and the expectation of semester plans and progress reports. Postdocs are encouraged to attend workshops at the university level for grant writing and also attend faculty candidate workshops at national meetings.

4) Extension and Continuing Education Instruction

None.

5) Curriculum Development

At Georgia Tech I co-developed online content for one undergraduate course. At OSU/CSU, I developed two graduate courses and one undergraduate course. The graduate courses are Advanced Fluid Mechanics, and Cardiovascular Biofluid Mechanics. The fluids course is a core course for the MS and PhD programs that mechanical engineering graduate students may take. The biofluids course is a technical elective course open to biomedical and mechanical/chemical engineering students. Both of these courses provide students with advanced knowledge in fluid mechanics and biofluid mechanics while maintaining an introductory style, thus building and reinforcing fundamental principles at an advanced level. In addition to these two graduate courses, I developed a new undergraduate course to support the creation of the new undergraduate biomedical engineering dual degree program at CSU. This course is BIOM300 – Problem based learning laboratory, a 4-credit required lab course for all dual degree biomedical

engineering students. The novel aspect of this course is its non-didactic style to inculcate the core biomedical engineering experience of “multi-disciplinary problem solving” in the context of health care. The course achieves this through a series of open-ended biomedical engineering problems that require students to perform inquiry, hypothesis development, experimental design, data analysis, and communication of results as a team. Through this process, the students learn to appreciate true teamwork while exposing themselves to advanced topics in biomedical engineering – including biomechanics, imaging, exercise physiology, and medical devices.

6) Brief Description of your approach to and goals in teaching, major accomplishments, plans for the future in teaching

Teaching and mentoring has been the most rewarding aspect of my duties as a faculty member at Ohio State University (OSU) and Colorado State University (CSU). It is an honor and great privilege to shape future minds, each inherently unique. Since starting as a faculty member, I have been the primary instructor for 6 courses - 2 graduate and 4 undergraduate levels, and I have helped co-teach 2 additional graduate courses. I also regularly participate in the senior design capstone courses in mechanical and biomedical engineering. I have found that these teaching/mentoring activities truly push my own knowledge about the course material and these activities further strengthen my passion for academia. This has been particularly true for the three new courses that I have had the privilege to develop. These experiences have fundamentally changed the way I see “teaching” in comparison to what I believed prior to becoming a professor. I now appreciate that successful teaching involves much more than just “lecturing”. Rather, it actively involves the establishment of a low level connection with students, which then dictates the manner in which high level knowledge must be broken down and presented. This is a dynamic process and every class (even for the same course) is different. In essence, the connection must be optimal to maximize the absorption of knowledge. This process defines my teaching strategy that can be simplistically represented as: (a) continuously excite the students about the subject matter through the significance of the knowledge and its intellectual appeal, (b) provide the fundamental principles in the most general form, yet in an applicable manner that any engineering student can master, and (c) challenge the minds to the highest level requiring true independent thought and mastery in the application of fundamental principles. This simple strategy truly represents my classroom teaching philosophy, which I believe strongly and positively impacts student learning objectives.

Outside of the classroom, I strongly believe in the concept of a capstone senior design experience in biomedical engineering. Over the past five years, I have sponsored and challenged groups of seniors to address a variety of engineering problems related to state-of-the-art cardiovascular bioengineering design problems on prosthetic heart valves, left heart simulators, and minimally invasive cardiovascular surgical tools. These mentoring experiences were highly successful in generating a high level of intellectual challenge for budding engineers as well as advancing research in these areas. Most of these senior design products proved to be valuable proof-of-concept experiments for my successful grants and are still used in the lab to-date.

Overall, I love teaching and I have had a truly awesome and rewarding experience. I look forward to further evolving my classes towards the highest quality.

7) Evaluation of Teaching

In our department, the teaching is evaluated through Student Evaluation of Instructors (SEI), Qualtrics student survey, and peer evaluations provided by colleague. Our department maintains the CQI (Continuous Quality Improvement) table for each and every course. After every semester, I participate in the self-assessment of the course and update the CQI table for future offerings. I have always taken into account comments from students and colleagues and continuously improved my teaching. At CSU as well as at OSU, my SEI scores (item 10) have either met or exceeded college metrics or has been the best SEI score for that course in our department. To help students who struggle with equation/math aspects of biomedical engineering, I offer more one-on-one time with students outside of office hours as well as incorporated more problem solving in class sessions. This helps the student learn as well as appreciate their own limitations better.

8) Awards and Formal Recognition for Teaching

2020, ABME Best Paper Award "Sinus Hemodynamics Variation with Tilted Transcatheter Aortic Valve Deployments paper".

2017, Melissa G. Piper Distinguished Mentor Award, Dorothy M. Davis Heart & Lung Research Institute, The Ohio State University, Columbus OH, USA.

2015, Nominated for Best Professor Award - Edays, College of Engineering, Colorado State University, Fort Collins CO, USA.

2014, George T. Abell Outstanding Teaching & Service Faculty Award, College of Engineering, Colorado State University, Fort Collins CO, USA.

2011, Nominated for the Best Teacher Award at the University Level, Colorado State University.

2006, Teaching Fellowship Award, School of Biomedical Engineering, Georgia Institute of Technology, Atlanta GA, USA.

2002, Outstanding Teaching Assistant Award, Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta GA, USA.

9) Other Academic Advising

I frequently recruit and advise high-school students as well as minority students from the community. I am also involved in advising MD fellows at Nationwide Children through my involvement in a Cardiovascular T32 grant at Nationwide (PI: Vidu Garg). I also participate as mentor to students as well as junior faculty at various national meeting mentoring workshops.

10) Teaching Professional Development

I attended teaching workshops at Georgia Institute of Technology on developing the "Problem Based Learning" concept. I also attended University teaching center workshops at Colorado State University as an Assistant Professor as part of professional development.

Research

1) List of Books, Articles, and Other Published Papers

I have published 78 journal papers (25 since tenure), 142 peer-reviewed conference proceedings, 33 abstracts, 1 book chapter, 8 US patent/applications. The journal and conference papers are mainstream

journals/conferences in my field with highly selective acceptance criteria (<25% on average).

Published Work Type	Number of Publications
Chapters In Edited Books	1
Peer-Reviewed Journal Articles	100
Editor Reviewed Journal Articles	2
Reviews	7
Abstract And Short Entries	33
Papers In Proceedings	142
Total	253

a) Books (Other than Edited Volumes)

None

b) Edited Books

None

c) Chapters in Edited Books

1. Heitkemper M and Dasi LP. (2018). Polymeric heart valves in the book “Principles of Heart Valve Engineering” Edited by Arash Kheradvar. Elsevier. Cambridge MA.
Publication status: To be Published. Percent of authorship: 50%. First author is my PhD student.

d) Bulletins, Tech Reports, Fact Sheets

None

e) Peer-Reviewed Journal Articles

1. H. Chen, and Dasi LP. An In-Vitro Study of the Flow Past a Transcatheter Aortic Valve Using Time-Resolved 3D Particle Tracking, Annals of Biomedical Engineering, DOI : 10.1007/s10439-023-03147-8. 2023 (in press)
2. Baig I, Lee ARJ, Brinkman W, Gopal A, Dasi LP and Al-Azizi K. Simultaneous Kissing Balloon Inflation of the Transcatheter Aortic Valve Replacement Valve and an Ostial Coronary Stent-A Novel Coronary Protection Technique. Structural Heart-the Journal of the Heart Team. 2022;6.
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Publication status: Published, Type of review: Peer Review, Percent of authorship: 50%, Description of effort: The first author is my Phd student, issn: 0723-4864

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 50%, Description of effort: The first author is my MS student, issn: 1869-4098

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 20%, Description of effort: Experimental validation, issn: 0022-1120

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 20%, Description of effort: Experimental validation, issn: 0022-1120

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 50%, Description of effort: The first author is my Phd student, issn: 0090-6964

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 50%, Description of effort: The first author is my Phd student, issn: 0723-4864

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 50%, Description of effort: The first author is my Phd student, issn: 1070-6631

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 50%, Description of effort: The first author is my PhD student, issn: 1869-4098

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 50%, Description of effort: The first author is my Phd student, issn: 0148-0731

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 50%, Description of effort: The first author is my Phd student, issn: 2051-817X

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 50%, Description of effort: collaborator, issn: 1687-8787

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 5%, Description of effort: The first author is my collaborator, issn: 0022-5223

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 10%, Description of effort: The first author is my mentee, issn: 0022-5223

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 20%, Description of effort: conducted experiments, issn: 0743-7463

95. E.M. Spinner, K. Sundareswaran, Lakshmi P. Dasi, V.H. Thourani, J. Oshinski, and A.P. Yoganathan, "Altered right ventricular papillary muscle position and orientation in patients with a dilated left ventricle", *Journal of Thoracic and Cardiovascular Surgery*, Vol 141, Issue 3, Pages 744-749. (2011). Impact Factor: 3.991.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 50%, Description of effort: The first author is my mentee, issn: 0022-5223

96. Lakshmi P. Dasi, K. Whitehead, K. Pekkan, D.A. deZelicourt K. Sundareswaran, K. Kanter, M. Fogel, and A.P. Yoganathan, "Pulmonary hepatic flow distribution in total cavopulmonary connections: extra cardiac vs. intra atrial", *Journal of Thoracic and Cardiovascular Surgery*, Vol 141, Issue 1, Pages 207-214. (2011). Impact Factor: 3.991.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 80%, Description of effort: The first author, issn: 0022-5223

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Procoagulant Potential of B-datum Leakage Jet Flow in Bileaflet Mechanical Heart Valves via Application of Vortex Generator Arrays”, *Journal of Biomechanical Engineering-Transactions of the ASME*, Vol. 132, Issue 7, 071011, (2010). Impact Factor: 1.748.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 50%, Description of effort: The first author is my mentee, issn: 0148-0731

98. Lakshmi P. Dasi, K. Sundareswaran, D.A. deZelicourt, K. Pekkan, K. Whitehead, S. Sharma, K. Kanter, M. Fogel, and A.P. Yoganathan, “FONTAN HEMODYNAMICS: WHAT IS THE PROBLEM?”, *Journal of Thoracic and Cardiovascular Surgery*, Vol 139, Issue 6, Pages 1673-1674. (2010). Impact Factor: 3.991.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 80%, Description of effort: The first author, issn: 0022-5223

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 70%, Description of effort: The first author, issn: 0022-5223

100. C.H. Yap, Lakshmi P. Dasi, and A.P. Yoganathan, “Dynamic hemodynamic energy loss in normal and stenosed aortic valve”, *Journal of Biomechanical Engineering-Transactions of the ASME*, 132, 021005 (2010). Impact Factor: 1.748.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 50%, Description of effort: The first author is my mentee, issn: 0148-0731

101. Lakshmi P. Dasi, K. Pekkan, D.A. deZelicourt, K.S. Sundareswaran, R. Krishnankutty, P.J. delNido, and A.P. Yoganathan, “Hemodynamic energy dissipation in the cardiovascular system: Generalized theoretical analysis on disease states”, *Annals of Biomedical Engineering*, Vol 37(4), pp. 661-673. (2009). Impact Factor: 3.231.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 80%, Description of effort:, issn: 0090-6964

102. Lakshmi P. Dasi, R. Krishnankutty, H.D. Katajima, K. Pekkan, M. Fogel, S. Sharma, K. Kanter, and A.P. Yoganathan, “Fontan hemodynamics: Importance of pulmonary artery diameter” *Journal of Thoracic and Cardiovascular Surgery*, Vol 137(3), pp. 560-564. (2009). Impact Factor: 3.991.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 80%, Description of effort: The first author, issn: 0022-5223

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 20%, Description of effort: issn: 0090-6964

104. K.S. Sundareswaran, K. Pekkan, Lakshmi P. Dasi, K. Whitehead, S. Sharma, K.R. Kanter, M.A. Fogel, and A.P. Yoganathan, "The total cavopulmonary connection resistance: A significant impact on single ventricle hemodynamics at rest and exercise," *American Journal of Physiology – Heart and Circulatory Physiology*, Vol. 295 (6), pp. H2427-H2435. (2009). Impact Factor: 4.012.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 10%, Description of effort: data analysis and writing, issn: 1522-1539

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 80%, Description of effort: The first author, issn: 0021-9290

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 70%, Description of effort: The first author, issn: 0021-9290

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108. R. Haj-Ali, Lakshmi P. Dasi, H.S. Kim, J. Choi, H.A. Simon, and A.P. Yoganathan, "Structural simulations of prosthetic tri-leaflet aortic heart valves" *Journal of Biomechanics*, Vol 41 (7), pp. 1510-1519. (2008). Impact Factor: 2.496.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 10%, Description of effort: The first author is my collaborator, issn: 0021-9290

109. R.J. Miller, Lakshmi P. Dasi, and D.R. Webster, "Multipoint correlations of concentration fluctuations in a turbulent passive scalar field," *Experiments in Fluids*, Vol 44 (5), pp. 719-732. (2008). Impact Factor: 1.907.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 30%, Description of effort: data collection, issn: 0723-4864

110. K. Pekkan, Lakshmi P. Dasi, P. Nourparvar, S. Yerneni, K. Tobita, M. Fogel, B. Keller, and A.P. Yoganathan, "In Vitro Hemodynamic Investigation of Embryonic Aortic Arch at Late Gestation", *Journal of Biomechanics*, Vol 41 (8), pp. 1697-1706. (2008). Impact Factor: 2.496.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 10%, Description of effort: The first author is my collaborator, issn: 0021-9290

111. A.M. Fallon, Lakshmi P. Dasi, U.M. Marzec, S.R Hanson, and A.P. Yoganathan, "Procoagulant properties of flow fields of mechanical heart valve hinge channels in a Novel in vitro Flow system," *Annals of Biomedical Engineering*, vol 36 (1), pp 1-13. (2008). Impact Factor: 3.231.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 20%, Description of effort: The first author is my mentee, issn: 0090-6964

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 25%, Description of effort: The first author is my collaborator, issn: 0090-6964

113. R. Krishnankutty, Lakshmi P. Dasi, H.D. Katajima, K.S. Sundareswaran, K. Pekkan, M. Fogel, S. Sharma, K. Kanter, and A.P. Yoganathan, "Quantitative Analysis of Extracardiac Versus Intraatrial Fontan Anatomic Geometries" *Annals of Thoracic Surgery* , Vol 85 (3), pp 810-817. (2008). Impact Factor: 3.631.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 25%, Description of effort: First author is my mentee, issn: 0003-4975

114. D.H. Frakes, Lakshmi P. Dasi, K. Pekkan, H. Katajima, A.P. Yoganathan, and J.T. Mark, "A New Adaptive Method for Registration-Based Medical Image Interpolation," *IEEE Transactions on Bio-Medical Engineering*, vol 27 (3), pp 370-377. (2008). Impact Factor: 2.233.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 25%, Description of effort: co-developed new algorithm, issn: 0018-9294

115. D. Frakes, Pekkan K., Lakshmi P. Dasi, H.D. Katajima, D.A. deZelicourt, H.L. Leo, J. Carberry, K.S. Sundareswaran, and A.P. Yoganathan, "Modified Control Grid Interpolation for the Reconstruction of Fluid Flows" *Experiments in Fluids* , Vol. 45(6), pp. 987-997, (2008). Impact Factor: 1.907.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 20%, Description of effort: data collection and processing, issn: 0723-4864

116. P. Sucusky, Lakshmi P. Dasi, M. Paden, J. Fortenberry, and A.P. Yoganathan, "Development of a Novel Fluid Management System for Accurate Continuous Hemofiltration in Extracorporeal Membrane Oxygenation", *Journal of Medical Devices-Transactions of the ASME*, Vol. 2, Article 035002 (2008). Impact Factor: 0.617.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 20%, Description of effort: data collection and processing, issn: 1932-6181

117. M. Padala, N.V. Vasilyev, J.W. Owen Jr, Lakshmi P. Dasi, J.H. Jimenez, P.J. delNido, A.P. Yoganathan, "Cleft closure and undersizing annuloplasty improve mitral repair in atrioventricular canal defects" *Journal of Thoracic and Cardiovascular Surgery* , Vol 136(5): pp. 1243-1249 (2008). Impact Factor: 3.991.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 50%, Description of

effort: The first author is my PhD mentee, issn: 0022-5223

118. Lakshmi P. Dasi, L. Ge, H. A. Simon, F. Sotiropoulos, and A.P. Yoganathan, "Vorticity dynamics of bileaflet mechanical heart valves in an axisymmetric aorta," *Physics of Fluids*, Vol 19, Article 067105, (2007). Also selected to appear in July 1, 2007 issue of *Virtual Journal of Biological Physics Research*. Impact Factor: 2.040.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 80%, Description of effort: The first author, issn: 1070-6631

119. Lakshmi P. Dasi, F. Schuerg, and D.R. Webster, "The Geometric Properties of High Schmidt Number Passive Scalar Iso-surfaces in Turbulent Flows," *Journal of Fluid Mechanics*, Vol. 588, pp. 253-277. (2007). Impact Factor: 2.294.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 90%, Description of effort: Experimental validation, issn: 0022-1120

120. H.A. Simon, Lakshmi P. Dasi, H.W. Leo, and A.P. Yoganathan, "Spatio-temporal flow analysis in bileaflet heart valve hinge regions: Potential analysis for blood element damage," *Annals of Biomedical Engineering*, vol 35 (8), pp 1333-1346. (2007). Impact Factor: 3.231.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 20%, Description of effort: writing, data processing, issn: 1573-9686

121. H.W. Leo, Lakshmi P. Dasi, J. Carberry, H.A. Simon, and A.P. Yoganathan, "Fluid Dynamic Assessment of Three Polymeric Heart Valves Using Particle Image Velocimetry," *Annals of Biomedical Engineering*, 34 (6): 936-952 (2006). Impact Factor: 3.231.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 20%, Description of effort: The first author is my mentee, issn: 0090-6964

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Publication status: Published, Type of review: Peer Review, Percent of authorship: 20%, Description of effort: The first author is my mentee, issn: 0966-8519

123. D.R. Webster, S. Rahman, and Lakshmi P. Dasi, "Laser-induced Fluorescence Measurements of a Turbulent Plume," *Journal of Engineering Mechanics*, vol. 129, pp. 1130-1137 (2003). Impact Factor: 1.173.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 20%, Description of effort: Helped with data and figures, issn: 0733-9399

124. D.R. Webster, S. Rahman, and Lakshmi P. Dasi, "On the Usefulness of Bilateral Comparison to Tracking Turbulent Chemical Odor Plumes," *Limnology and Oceanography*, vol. 46(5), pp. 1048 - 1053 (2001). Impact Factor: 3.615.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 20%, Description of effort: Helped with data and figures, issn: 1939-5590

f) Editor-Reviewed Journal Articles

1. Hoda Hatoum, J. Crestanello, and Lakshmi P Dasi, "Possible subclinical leaflet thrombosis in bioprosthetic aortic valves," New England Journal of Medicine, 10.1056/NEJMc1600179, pp. 280-287 (2016)

Publication status: Published, Type of review: Editor, Percent of authorship: 50%, Description of effort: The first author is my student, issn: 1533-4406

2. LP Dasi, J Grande-Allen, K Kunzelman, E Kuhl, "The Pursuit of Engineering the Ideal Heart Valve Replacement or Repair: A Special Issue of the Annals of Biomedical Engineering", Annals of Biomedical Engineering 45 (2), 307-309. (2017)

Publication status: Published, Type of review: Editor, Percent of authorship: 50%, Description of effort: first author, issn: 0090-6964

None

g) Other Journal Articles

None

h) Reviews (Indicate Whether Peer Reviewed)

Journal Articles

1. Lakshmi P. Dasi, Hoda Hatoum, Arash Kheradvar, Ramin Zareian, S. Hamed Alavi, Wei Sun, Caitlin Martin, Thuy Pham, Qian Wang, Prem A. Midha, Vrishank Raghav, Ajit P. Yoganathan, "On the Mechanics of Transcatheter Aortic Valve Replacement", Annals of Biomedical Engineering Volume 45, Issue 2, pp 310–331. (2017)

Publication status: Published, Type of review: Peer Review, Percent of authorship: 20%, Description of effort: The first author is my postdoc, issn: 0090-6964

2. Arash Kheradvar, Elliott M. Groves, Lakshmi P. Dasi, S. Hamed Alavi, Robert Tranquillo, K. Jane Grande-Allen, Craig A. Simmons, Boyce Griffith, Ahmad Falahatpisheh, Craig J. Goergen, Mohammad R. K. Mofrad, Frank Baaijens, Stephen H. Little, Suncica Canic, "Emerging Trends in Heart Valve Engineering: Part I. Solutions for Future", Annals of Biomedical Engineering, Vol. 43(4), pp 833-843, (2015)

Publication status: Published, Type of review: Peer Review, Percent of authorship: 5%, Description of effort: The first author is my postdoc, issn: 0090-6964

3. Arash Kheradvar, Elliott M. Groves, Craig J. Goergen, S. Hamed Alavi, Robert Tranquillo, Craig A. Simmons, Lakshmi P. Dasi, K. Jane Grande-Allen, Mohammad R. K. Mofrad, Ahmad Falahatpisheh, Boyce Griffith, Frank Baaijens, Stephen H. Little, Suncica Canic, "Emerging Trends in Heart Valve Engineering: Part II. Novel and Standard Technologies for Aortic Valve Replacement", Annals of Biomedical Engineering, Vol.

43(4), pp 844-857, (2015)

Publication status: Published, Type of review: Peer Review, Percent of authorship: 5%, Description of effort: The first author is my postdoc, issn: 0090-6964

4. Arash Kheradvar, Elliott M. Groves, Craig A. Simmons, Boyce Griffith, S. Hamed Alavi, Robert Tranquillo, Lakshmi P. Dasi, Ahmad Falahatpisheh, K. Jane Grande-Allen, Craig J. Goergen, Mohammad R. K. Mofrad, Frank Baaijens, Suncica Canic, Stephen H. Little, "Emerging Trends in Heart Valve Engineering: Part III. Novel Technologies for Mitral Valve Repair and Replacement", *Annals of Biomedical Engineering*, Vol. 43(4), pp 858-870, (2015)

Publication status: Published, Type of review: Peer Review, Percent of authorship: 5%, Description of effort: The first author is my postdoc, issn: 0090-6964

5. Arash Kheradvar, Elliott M. Groves, Ahmad Falahatpisheh, Mohammad K. Mofrad, S. Hamed Alavi, Robert Tranquillo, Lakshmi P. Dasi, Craig A. Simmons, K. Jane Grande-Allen, Craig J. Goergen, Frank Baaijens, Stephen H. Little, Suncica Canic, Boyce Griffith, "Emerging Trends in Heart Valve Engineering: Part IV. Computational Modeling and Experimental Studies", *Annals of Biomedical Engineering*, Vol. 43(10), pp 2314-2333, (2015)

Publication status: Published, Type of review: Peer Review, Percent of authorship: 5%, Description of effort: The first author is my postdoc, issn: 0090-6964

6. Lakshmi P. Dasi, H.A. Simon, and A. P. Yoganathan, "Artificial heart valve fluid mechanics," invited review in special series: *New Frontiers in Biomedical Engineering, Journal of Clinical and Experimental Pharmacology and Physiology*, Vol 36 (2), pp. 225-237. (2009). Impact Factor: 2.405.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 50%, Description of effort: The first author is my postdoc, issn: 1440-1681

7. Lakshmi P. Dasi, P. Sucosky, D. de Zelicourt, K. Sundareswaran, J. Jimenez, and A. P. Yoganathan, "Advances in cardiovascular fluid mechanics: Bench to bedside," *Annals of the New York Academy of Sciences*, Vol. 1161, pp 1-25. (2009) Impact Factor: 4.313.

Publication status: Published, Type of review: Peer Review, Percent of authorship: 50%, Description of effort: The first author is my postdoc, issn: 0077-8923

i) Abstract and Short Entries (Indicate Whether Peer Reviewed)

1. Shelley Gooden, Hoda Hatoum, Konstantinos Boudoulas and Lakshmi Prasad Dasi. Multiple MitraClips: The balancing act between pressure gradient and regurgitation. Engineering in Healthcare Industry & Research Symposium, Columbus, Ohio, 2019
2. Breandan Yeats, Hoda Hatoum, Thura Harfi, and Lakshmi Prasad Dasi. Predicting Thrombosis Risk in the Left Atrial Appendage of Human Heart. Engineering in Healthcare Industry & Research Symposium, Columbus, Ohio, 2019

3. Shelley Gooden, Hoda Hatoum, Konstantinos Boudoulas and Lakshmi Prasad Dasi. In-vitro modeling of mitral valve hemodynamics: Significance of left atrium function in the normal and repaired mitral valve with simulated MitraClip. Engineering in Healthcare Industry & Research Symposium, Columbus, Ohio, 2019
4. Megan Heitkemper, Hoda Hatoum and Lakshmi Prasad Dasi. A durable, hemocompatible, and low-cost polymeric transcatheter aortic heart valve. Engineering in Healthcare Industry & Research Symposium, Columbus, Ohio, 2019
5. Sri Krishna Sivakumar, Hoda Hatoum, Jennifer Dollery, Scott Lilly, Lakshmi Prasad Dasi. Pre-Procedural Patient-Specific In-Silico Deployment of SAPIEN and Evolut Transcatheter Aortic Valves. Engineering in Healthcare Industry & Research Symposium, Columbus, Ohio, 2019
6. Hatoum H and Dasi LP. Reduction of pressure gradient and turbulence using vortex generators in prosthetic heart valves. Davis Heart and Lung Research Institute Research Day, Columbus, Ohio, 2018
7. Hatoum H, Dollery J, Lilly S, Crestanello J and Dasi LP. In-vitro hemodynamics of a bicuspid versus a tricuspid aortic valve pre and post transcatheter aortic valve replacement. Engineering in Healthcare Industry & Research Symposium, Columbus, Ohio, 2018
8. Yousefi, P. Maureira, J. Crestanello, L. P. Dasi, "Role of Transcatheter Aortic Valve Stent Design on Its Durability", Engineering in Healthcare Engineering in Healthcare Research Symposium (EHIRS), Columbus OH, March 2017.
9. Yousefi, L. P. Dasi, "On the Fluid Mechanics of a Polymeric Tilted Disc Mechanical Heart Valve: TTK Chitra" DHLRI Research Day, Columbus, October 2016.
10. Yousefi, L. P. Dasi, "A Comparative Study between Transcatheter Aortic Valves: Implications on hemodynamics and durability" DHLRI Research Day, Columbus, October 2016.
11. Yousefi, L. P. Dasi, "Hemodynamics of a Novel Polymeric Transcatheter Heart Valve" DHLRI Research Day, Columbus, October 2016.
12. Yousefi, L. P. Dasi, "Optimum polymeric aortic heart valve geometry", The OSU BME I&R Symposium, Columbus, February 2016.
13. Yousefi, B. Moore, D. L. Bark, L. P. Dasi, "Optimum polymeric aortic heart valve geometry", Engineering Healthcare Summit, Columbus, November 2015.
14. Azimian, J. Dollery, J. Crestanello, and L. P. Dasi, "Parameterization of Aortic Root Geometry to Predict Coronary Artery Occlusion During TAVI ", Dorothy M. Davis Heart & Lung Research Institute (DHLRI) Research Day, Columbus OH, October 2016.
15. D.Flemister, H.Hatoum, R.Oba, A.Yousefi, J. Crestanello, L.P. Dasi. "Modulation of Coronary Flow Affects Aortic Sinus Vortex," Physiology and Cell Biology Research Day, Columbus OH, March 2017.
16. D.Flemister, H.Hatoum, R.Oba, A.Yousefi, J. Crestanello, L.P. Dasi. "Regulation of Coronary Flow Affects Aortic Sinus Vortex," Engineering in Healthcare: Industry & Research Symposium, Columbus,

Ohio, March 2017.

17. H. Hatoum, A. Yousefi, J. Dollery, J.A. Crestanello and L.P. Dasi, "In-vitro Hemodynamic assessment of a Transcatheter Aortic Valve in a Patient-Specific Aortic Root Model", Physiology and Cell Biology Research Day, Columbus, Ohio, March 2017
18. H. Hatoum, J. Dollery, J.A. Crestanello, and L.P. Dasi, "Effect of Surgical Valve Tissue Ingrowth and Calcification on Valve-in-Valve Hemodynamic Performance", Engineering in Healthcare Industry & Research Symposium, Columbus, Ohio, March 2017
19. H. Hatoum, A. Yousefi, J. Dollery, J.A. Crestanello, and L.P. Dasi, "In-vitro Hemodynamic assessment of a Patient-Specific Aortic Root Model before and after Transcatheter Aortic Valve Implantation", Physiology and Cell Biology Research Day, Columbus, Ohio, March 2017
20. H. Hatoum, J. Dollery, J.A. Crestanello, and L.P. Dasi, "Pressure Gradient and Leaflet Thrombosis Risk are optimized when the Deployment Valve-in-Valve is Sub-Annular", Physiology and Cell Biology Research Day, Columbus, Ohio, March 2017
21. H. Hatoum, J. Dollery, J.A. Crestanello, and L.P. Dasi, "Effective orifice area variation in valve-in-valve with Medtronic Evolut using degenerated versus non-degenerated surgical aortic valves", Physiology and Cell Biology Research Day, Columbus, Ohio, March 2017
22. H. Hatoum, A. Yousefi, J. Dollery, J.A. Crestanello, and L.P. Dasi, "An In-vitro Study of a Transcatheter Aortic Valve Implantation in a Patient-Specific Model", Davis Heart and Lung Research Institute Research Day, Columbus, Ohio, October 2016
23. H. Hatoum, A. Yousefi, J. Dollery, J.A. Crestanello, and L.P. Dasi, "In-vitro Hemodynamics of a Sutureless Valve and the Corresponding Valve-in-Valve Configuration", Davis Heart and Lung Research Institute Research Day, Columbus, Ohio, October 2016
24. H. Hatoum, J. Dollery, J.A. Crestanello, and L.P. Dasi, "Degenerated Calcified Bioprosthetic Surgical Valves Alter the Hemodynamics of the Valve-in-Valve Setup Compared with Non-Degenerated Valves In-Vitro", Davis Heart and Lung Research Institute Research Day, Columbus, Ohio, October 2016
25. H. Hatoum, A. Yousefi, J. Dollery, J.A. Crestanello, and L.P. Dasi, "Axial Deployment and Angular Orientation Change the Hemodynamics of Transcatheter Valve-in-Valve In-Vitro", Davis Heart and Lung Research Institute Research Day, Columbus, Ohio, October 2016
26. R. W. Oba, D. Bark, K. C. Popat, L. P. Dasi, "In Vitro Pulsatile Flow Loop Using Human Blood to Mimic Physiological Flow Conditions," Dorothy M. Davis Heart and Lung Research Institute Research Day, Columbus OH, February 2016.
27. R. W. Oba, A. Azimian, J. Dollery, J. A. Crestanello, L. P. Dasi, "Fluid Dynamic Testing of Patient-Specific Aortic Heart Valve Geometries in Vitro and in Silico," Dorothy M. Davis Heart and Lung Research Institute Research Day, Columbus OH, October 2016.
28. D. C. Flemister, R. W. Oba, A. Yousefi, H. Hatoum, J. A. Crestanello, L. P. Dasi, "Modulation of Coronary Flow Affects Aortic Sinus Vortex," Physiology and Cell Biology Research Day, Columbus OH, March 2017.

29. R. W. Oba, "Progress towards Understanding the Biomechanical Etiology of CAVD," Nationwide Children's Hospital: Works in Progress Seminar Series, Columbus OH, March 2017.
30. R. W. Oba, L. P. Dasi, "Bioreactor Flow Loop System for Hemodynamic Testing of Aortic Valve Tissues," Engineering in Healthcare Industry & Research Symposium, Columbus OH, March 2017.
31. L.P. Dasi, "Complexity of Aortic Sinus Hemodynamics: Insight into Calcific Aortic Valve Disease," CSU Research Colloquium Cardiovascular Research At CSU: Molecules, Models, and Mankind, Fort Collins CO, April, 2013.
32. Marcio Forleo, and L.P. Dasi, "Effect of Blood Pressure on the Lagrangian Blood Damage Index Measure Through the Bdatum Leakage Jet of the Bileaflet Mechanical Heart Valve," CSU Research Colloquium Cardiovascular Research At CSU: Molecules, Models, and Mankind, Fort Collins CO, April, 2013.
33. Michael Gogarty, Chris Orton, and L.P. Dasi, "Quantifying Heart Function in the Embryonic Zebrafish," CSU Research Colloquium Cardiovascular Research At CSU: Molecules, Models, and Mankind, Fort Collins CO, April, 2013.
34. Brennan M. Johnson, Deborah M. Garrity, and L.P. Dasi, "In Vitro Porcine Beating Heart Simulator," CSU Research Colloquium Cardiovascular Research At CSU: Molecules, Models, and Mankind, Fort Collins CO, April, 2013. (Winner of poster award)
35. Khandakar N. Morshed, Marcio Forleo, and L.P. Dasi, "Understanding shear induced hemolysis in turbulent flows," CSU Research Colloquium Cardiovascular Research At CSU: Molecules, Models, and Mankind, Fort Collins CO, April, 2013.
36. Haiming Tan, and L.P. Dasi, "New Frank-Starling Based Indices To Evaluate Severity of Systolic and Diastolic Failure," CSU Research Colloquium Cardiovascular Research At CSU: Molecules, Models, and Mankind, Fort Collins CO, April, 2013.
37. Mike Gogarty, and L.P. Dasi, "In Vitro Beating Heart Simulator for Minimally Invasive Heart Valve Therapy Research and Technology Development," Covidien Research & Development Summit, Westminster, CO, October, 2011.
38. Casey Dean, K. Popat, L.P. Dasi, and S.P James "Development of the cardiovascular applications of BioPoly," Covidien Research & Development Summit, Westminster, CO, October, 2011.
39. Brandon Moore, and L.P. Dasi, "Patient Specific Computational Fluid Dynamics Modelling Of Airway Flow With And Without Intubation," Covidien Research & Development Summit, Westminster, CO, October, 2011.
40. Marcio Forleo, Brennan Johnson, and L.P. Dasi, "Closing dynamics of Bileaflet Mechanical Heart Valve (BMHV) leaflets under normal and hypertensive physiological conditions," Covidien Research & Development Summit, Westminster, CO, October, 2011.

j) Papers in Proceedings (Indicate Whether Peer Reviewed)

1. Hatoum H, Hahn R, Lilly S, Dasi LP, Leipsic J, Wood D, Webb J. Varying Pressure Recovery characteristics between Balloon Expandable Versus Self Expanding Valves. Transcatheter Cardiovascular Therapeutics (TCT), San Francisco, CA, September 25-29, 2019.
2. Sathananthan J, Fraser R, Hatoum H, Barlow AM, Stanová V, Hensey M, Landes U, Alkhodair A, Sellers S, Cheung A, Ye J, Allen KB, Chhatrwalla A, Blanke P, Rieu R, Pibarot P, Dasi LP, Leipsic J, Wood D, Webb J. Bioprosthetic valve fracture performed pre versus post valve-in-valve transcatheter aortic valve replacement: Insights from bench testing. Transcatheter Cardiovascular Therapeutics (TCT), San Francisco, CA, September 25-29, 2019.
3. Alston M, Hatoum H, Orsinelli D, Rushing G, Dasi LP, O'Neil S, Matre N, Boudoulas K and Lilly S. Comparison of Invasive Versus Doppler Based Gradients between Balloon Expandable versus Self Expanding Valves. Society for Cardiovascular Angiography & Interventions (SCAI), Las Vegas, Nevada, May 19-22, 2019
4. Hoda Hatoum, Jayanathi Parthasarathy, Rajesh Krishnamurthy, Lakshmi Prasad Dasi. Patient-Specific Hemodynamic Assessment of Anomalous Aortic Origin of the Left Coronary Artery. Biomedical Engineering Society (BMES), Philadelphia, Pennsylvania, October 2019
5. Ana I. Salazar-Puerta, Dorma Flemister, Lilibeth Ortega-Pineda, Luke R. Lemmerman, Britani N. Blackstone, Heather Powell, Daniel Gallego-Perez, Lakshmi P. Dasi, Natalia Higuera-Castro. "Designer Extracellular Vesicle Therapies for Valvular Heart Disease" Annual BMES Conference, Philadelphia, PA, October 2019.
- 6.
7. Hoda Hatoum, Scott Lilly, Lakshmi Prasad Dasi. Direct Comparison of Invasive Versus Doppler Based Gradients between Balloon Expandable Versus Self Expanding Valves. Biomedical Engineering Society (BMES), Philadelphia, Pennsylvania, October 2019
8. Yeats B, Heitkemper M, and Dasi LP. Evaluating the Durability of Polymeric Transcatheter Aortic Valve Replacements. Biomedical Engineering Society Annual Meeting, Philadelphia PA, October 2019.
9. Hoda Hatoum, Zhenyu Wang, Lakshmi Prasad Dasi. Impact of Superhydrophobicity on Prosthetic Heart Valve Hemodynamics. Biomedical Engineering Society (BMES), Philadelphia, Pennsylvania, October 2019
10. Hoda Hatoum, Scott Lilly, Pablo Maureira, Juan Crestanello, Lakshmi Prasad Dasi. Sinus Hemodynamics after Transcatheter Aortic Valve in Transcatheter Aortic Valve. Biomedical Engineering Society (BMES), Philadelphia, Pennsylvania, October 2019
11. Sri Krishna Sivakumar, Megan Heitkemper, Hoda Hatoum, Susan O'Neil, Scott Lilly, Lakshmi Prasad Dasi. A Numerical Model for Patient-Specific In-Silico Deployment of Self-Expanding and Balloon-Expanding Transcatheter Aortic Valves. Biomedical Engineering Society (BMES), Philadelphia, Pennsylvania, October 2019
12. Breandan Yeats, Megan Heitkemper, Hoda Hatoum, Susan James, Lakshmi Prasad Dasi. Use Of Finite Element Analysis To Predict Failure Points In Polymeric Transcatheter Aortic Valve Replacements. Biomedical Engineering Society (BMES), Philadelphia, Pennsylvania, October 2019

13. Megan Heitkemper, Zhenyu Wang, Hoda Hatoum, Jun Kim, Lakshmi Prasad Dasi. Effect of Leaflet Opening Geometry on Valve Performance and Turbulent Shear Stresses. Biomedical Engineering Society (BMES), Philadelphia, Pennsylvania, October 2019
14. Shelley Gooden, Hoda Hatoum, Konstantinos Boudoulas, Lakshmi Prasad Dasi. Efficacy of Central MitraClip Placement in FMR and DMR. Biomedical Engineering Society (BMES), Philadelphia, Pennsylvania, October 2019
15. Sri Krishna Sivakumar, Megan Heitkemper, Hoda Hatoum, Susan O'Neil, Scott Lilly, Lakshmi Prasad Dasi. Patient-specific Transcatheter Aortic Valve Implantation – Effect of Valve Orientation on Coronary Obstruction. Biomedical Engineering Society (BMES), Philadelphia, Pennsylvania, October 2019
16. Zhenyu Wang, Hoda Hatoum, Lakshmi Prasad Dasi. Controlling the Flow Separation in Heart Valves Using Vortex Generators. Biomedical Engineering Society (BMES), Philadelphia, Pennsylvania, October 2019
17. SivaKumar K, Hatoum H, O'Neil S, Rushing G, Lilly S and Dasi LP. Effect of Pre-deployment Valve Positioning on Annular Stress during Transcatheter Aortic Valve Implantation. Biomedical Engineering Society 2019, Philadelphia, Pennsylvania, October 16-19, 2019.
18. Hatoum H, Lilly S, Maureira P, Crestanello J and Dasi LP. Turbulence after Transcatheter Aortic Valve in Transcatheter Aortic Valve Implantation. Biomedical Engineering Society 2019, Philadelphia, Pennsylvania, October 16-19, 2019.
19. Hatoum H, Lilly S, Crestanello J and Dasi LP. Patient-Specific Modeling of Transcatheter Aortic Valve Replacement. Biofabrication, Columbus, Ohio, October 20-22, 2019.
20. Zakko J, Drews J, Yi T, Blum K, Kelly J, Heitkemper M, Gooden S, Wu Y, Ragsdale E, Texter K, Strainic J, Wang Y, Dasi L, Bocks M, Armstrong A, Breuer C. Cardiovascular Tissue Engineering in the Fetus. International Symposium for Applied Cardiovascular Biology and Vascular Tissue Engineering. 2019. Zurich, Switzerland.
21. Hatoum H, Bark D Jr., Vahabi H, Movafaghi S, Moore B, Forleo M, Kota A, Popat K, and Dasi LP. Superhydrophobicity and Vortex Generators Potential To Reduce Thrombogenicity After Prosthetic Valve Implantation. SB3C: Summer Biomechanics, Bioengineering, and Biotransport, Seven Springs, Pennsylvania, USA, June 25-28, 2019.
22. 5. Hatoum H and Dasi LP. Aortic Sinus Vortex Spatio-Temporal Variations With Leaflet Calcification. SB3C: Summer Biomechanics, Bioengineering, and Biotransport, Seven Springs, Pennsylvania, USA, June 25-28, 2019.
23. Bailoor S, Seo JH, Hatoum H, Dasi LP and Mittal R. Reduced-Order Leaflet Models For Numerical Experiments On Transcatheter Aortic Valves. SB3C: Summer Biomechanics, Bioengineering, and Biotransport, Seven Springs, Pennsylvania, USA, June 25-28, 2019.
24. Heitkemper M, Hatoum H, Yeats B, Dollery J, Whitson B, Rushing G, Lilly S and Dasi LP. Introduction of A Simple 2D Computational Model To Predict Risk Of Coronary Obstruction During Transcatheter Aortic Valve Replacement. SB3C: Summer Biomechanics, Bioengineering, and Biotransport, Seven Springs, Pennsylvania, USA, June 25-28, 2019.
25. Shelley Gooden, Hoda Hatoum, Konstantinos Boudoulas and Lakshmi Prasad Dasi. Multiple MitraClips: The Balancing Act between Pressure Gradient and Regurgitation. Summer Biomechanics

- Bioengineering Biotransport (SB3C), Seven Springs, Pennsylvania, June 2019
26. Hoda Hatoum, Pablo Maureira, Scott Lilly and Lakshmi Prasad Dasi. BASILICA-Type Leaflet Laceration to Reduce Risk of Thrombosis in Transcatheter Aortic Valve Replacement. Summer Biomechanics Bioengineering Biotransport (SB3C), Seven Springs, Pennsylvania, June 2019
 27. Hoda Hatoum, Maurice Alston, David Orsinelli, Gregory Rushing, Susan O'Neil, Nancy Matre, Konstantinos D. Boudoulas, Scott M. Lilly and Lakshmi Prasad Dasi. Intra-Valvular Pressure Dynamics and Valve Specific Pressure Recovery in Transcatheter Aortic Valve Replacement: Implication on Validity of Echo Derived Gradient. Summer Biomechanics Bioengineering Biotransport (SB3C), Seven Springs, Pennsylvania, June 2019
 28. Hoda Hatoum, Jung-Hee Seo, Shantanu Bailoor, Scott Lilly, Rajat Mittal and Lakshmi Prasad Dasi. Early Diagnosis of Reduced Leaflet Mobility after Transcatheter Aortic Valve Replacement. Summer Biomechanics Bioengineering Biotransport (SB3C), Seven Springs, Pennsylvania, June 2019
 29. Sri Krishna Sivakumar, Hoda Hatoum, Jennifer Dollery, Scott Lilly, Lakshmi Prasad Dasi. Pre-Procedural Patient-specific In-silico Deployment of SAPIEN and Evolut Transcatheter Aortic Valves. Summer Biomechanics Bioengineering Biotransport (SB3C), Seven Springs, Pennsylvania, June 2019
 30. Breandan Yeats, Hoda Hatoum, Thura Harfi, and Lakshmi Prasad Dasi. Predicting Thrombosis Risk in the Left Atrial Appendage of Human Heart. Summer Biomechanics Bioengineering Biotransport (SB3C), Seven Springs, Pennsylvania, June 2019
 31. Tori Burton, Hoda Hatoum and Lakshmi Prasad Dasi. A Study of Pressure Dynamics across a Stenotic Orifice. Summer Biomechanics Bioengineering Biotransport (SB3C), Seven Springs, Pennsylvania, June 2019
 32. Megan Heitkemper, Zhenyu Wang, Hoda Hatoum, Jun Kim and Lakshmi Prasad Dasi. Effect of Leaflet Opening Geometry on Turbulent Characteristics for Prosthetic Aortic Valve Applications. Summer Biomechanics Bioengineering Biotransport (SB3C), Seven Springs, Pennsylvania, June 2019
 33. Seo JH, Bailoor S, Hatoum H, Dasi LP and Mittal R. Leaflet Kinematics and Transvalvular Hemodynamics in Normal and Thrombosed Transcatheter Aortic Valves. 15th U.S. Congress on Computational Mechanics (USNCCM15), Austin, Texas, USA, July 28-August 1, 2019.
 34. Hatoum H, Maureira P, Lilly S and Dasi LP. Impact of BASILICA on Sinus and Neo-sinus Washout after Transcatheter Aortic Valve-in-Valve. (Heart Valve Society HVS, Barcelona, Spain, April 11-13, 2019).
 35. Hatoum H, Maureira P, Lilly S and Dasi LP. Impact of Basilica on Sinus and Neo-sinus Washout after Transcatheter Aortic Valve-in-valve. (Cardiovascular Research Technologies CRT, Washington DC, March 2-5, 2019).
 36. Heitkemper M, Hatoum H, Yeats B, Dollery J, Whitson B, Rushing G, Lilly S and Dasi LP. 3D Computational Model to Predict Risk of Coronary Obstruction During TAVR. (Cardiovascular Research Technologies CRT, Washington DC, March 2-5, 2019).
 37. Heitkemper M, Tugaoen Z, Uzendu A, Rushing G, Dollery J, Lilly S, and Dasi LP. Reconstructive Modeling to Identify Patients At-Risk for Coronary Occlusion Still Eligible for TAVR. Cardiovascular Research Technologies (CRT), Washington D.C., March 2019
 38. Hatoum H, Dollery J, Lilly S, Crestanello and Dasi LP. Sinus Hemodynamics Variation with Tilted Transcatheter Aortic Valve Deployments. (Biomedical Engineering Society BMES, Atlanta, Georgia, October 17-20, 2018).
 39. D.C. Flemister, L.P Dasi Ph.D. "On the Relevance of Aortic Valve's Branching Fibrous Architecture On Valve Mechanics and Stress Distribution" 50th Annual BMES Conference, Atlanta, GA, October 2018
 40. D.C. Flemister, L.P Dasi Ph.D. "A Novel Low-Cost 3D Printed Digital Material Valve: To Simplify Heart Valve Modeling Studies" 50th Annual BMES Conference, Atlanta, GA, October 2018
 41. Heitkemper M, Hatoum H and Dasi LP. A Novel Transcatheter Polymeric Heart Valve. (Biomedical Engineering Society BMES, Atlanta, Georgia, October 17-20, 2018).
 42. Hatoum H and Dasi LP. Reduction of pressure gradient and turbulence using vortex generators in prosthetic heart valves. Biomedical Engineering Society (BMES), Atlanta, Georgia, October 2018

43. Hatoum H, Dollery J, Lilly S, Crestanello J and Dasi LP. Coronary Occlusion after Transcatheter Aortic Valve Implantation: Effect of Valve Type and Positioning. Biomedical Engineering Society (BMES), Atlanta, Georgia, October 2018
44. Mastran M, Hatoum H and Dasi LP. Novel trileaflet mechanical valve hemodynamics and turbulent stresses. Biomedical Engineering Society (BMES), Atlanta, Georgia, October 2018
45. Gooden S, Hatoum H, Boudoulas KD and Dasi LP. Effect of Atrial Function on Mitral Valve Hemodynamics after Transcatheter Mitral Valve Replacement. Biomedical Engineering Society (BMES), Atlanta, Georgia, October 2018
46. Heitkemper M, James S, and Dasi LP. Application of Additive Manufacturing for Novel Transcatheter Heart Valve Stents. International Conference of Biofabrication, Columbus, Ohio. October 2019
47. Flemister D, Hatoum H, Oba R , Lincoln J, Crestanello J, and Dasi LP. Effect of Left versus Right Coronary Flow Waveform On Aortic Sinus Hemodynamics, Leaflet Shear Stress, And Calcification. Biomedical Engineering Society (BMES), Atlanta, Georgia, October 2018
48. Hatoum H and Dasi LP. On the effective visualization of aortic sinus flows: Eulerian vs Lagrangian schemes (The European Society for Clinical Hemorheology and Microcirculation - The International Society of Clinical Hemorheology - The International Society of Biorheology (ESCHM-ISB-ISCH), Krakow, Poland, July 2-6, 2018) – accepted but withdrawn.
49. Heitkemper M, Hatoum H and Dasi LP. A durable, hemocompatible, and low-cost polymeric transcatheter aortic heart valve. Transcatheter Cardiovascular Therapeutics (TCT), San Diego, California, September 2018
50. Dorma Flemister, Brad Hoehne, Jayanthi Parthasarathy, Lakshmi Prasad Dasi, “Fibrous Architecture of the Aortic Valve Aids in Leaflet Mechanics and Hemodynamics,” *World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018.*
51. Hoda Hatoum, and L.P. Dasi, “Patient Specific Biomechanical Interaction of Transcatheter Aortic Valves: Towards Precision Medicine,” *World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018.*
52. Hoda Hatoum, Rugonyi S, and L.P. Dasi, “Experimental In-Vitro Study of a Patient Specific BT-Shunt Hemodynamics,” *World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018.*
53. Amirsepehr Azimian, Scott Lilly, Jennifer Dollery, Juan Crestanello, Lakshmi Prasad Dasi, “Predicting Adverse Outcomes of Transcatheter Aortic Valve Replacement Using Patient-Specific Computational Modeling,” *World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018.*
54. Amirsepehr Azimian, Hoda Hatoum, Scott Lilly, Jennifer Dollery, Juan Crestanello, Lakshmi Prasad Dasi, “Accurate Predictive Models To Assess Coronary Obstruction And Paravalvular Leakage During TAVR,” *World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018.*
55. Heitkemper M, Wise J, Prawel D, James S, and Dasi LP, “Surface Modifications for Optimizing Hemodynamics,” *World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018.*
56. Heitkemper M, Hatoum H, Crestanello J and Dasi LP, “Towards a Flow Independent Severity Index to Assess Calcific Aortic Valve Stenosis: Modelign the Unsteady Effects,” *World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018.*

57. Yousefi A, Heitkemper M, Simon-Walker R, Bui H, Popat K, James S, Cheatham J and Dasi LP, "Novel Hyaluronan Enhanced Polymeric Transcatheter Aortic Valve Replacement: A proof of concept," *World Congress of Biomechanics, Dublin, Ireland, July 8-12, 2018*.
58. Amirsepehr Azimian, Scott Lilly, Jennifer Dollery, Juan Crestanello, Lakshmi Prasad Dasi, "Predictive Method for Paravalvular Leakage after Transcatheter Aortic Valve Replacement (TAVR) Using Patient-Specific Computational Modeling," *CRT 2018, Washington DC March 3-6, 2018*.
59. Amirsepehr Azimian, Scott Lilly, Jennifer Dollery, Juan Crestanello, Lakshmi Prasad Dasi, "Accurate Model to Predict Coronary Obstruction during TAVR," *CRT 2018, Washington DC March 3-6, 2018*.
60. Hoda Hatoum, , and L.P. Dasi, "In-vitro Assessment of Patient-Specific Transcatheter Aortic Valves Adverse Effects," *18th U.S. National Congress for Theoretical and Applied Mechanics, Chicago, Illinois, June 4-9, 2018*.
61. L.P. Dasi, "Bioprosthetic Valves, Fluid Mechanics, and Thrombosis," *Heart Valve Society 2018 annual scientific meeting, New York City, New York, April 12-14, 2018*.
62. Hoda Hatoum, and L.P. Dasi, "Pathomechanistic Insights into Prosthetic Valve Thrombosis," *Heart Valve Society 2018 annual scientific meeting, New York City, New York, April 12-14, 2018*.
63. David Bark, Hamed Vahabi, Sanli Movafaghi, Ketul Popat, Arun Kota, and L.P. Dasi, "Superhydrophobicity to minimize thrombogenic risk on mechanical heart valves," *DFD17 Meeting of The American Physical Society, Denver, CO, November, 2017*. Also Bulletin of American Physical Society, Vol. 62 (2017).
64. Hoda Hatoum, and L.P. Dasi, "Vortex dynamics in Patient-Specific Stenotic Tricuspid and Bicuspid Aortic Valves pre-and post-Trans-catheter Aortic Valve Replacement," *DFD17 Meeting of The American Physical Society, Denver, CO, November, 2017*. Also Bulletin of American Physical Society, Vol. 62 (2017).
65. R. W. Oba, J. Lincoln, Lakshmi Prasad Dasi, "Ex Vivo Bioreactor System for Studying the Biomechanical Etiology of CAVD," *Weinstein Cardiovascular Development and Regeneration Meeting, Columbus OH, May 2017*.
66. Yousefi, P. Maureira, J. Crestanello, L. P. Dasi, "An In Vitro Study on Long-Term Durability of Transcatheter Aortic Valve Prostheses", *Weinstein Conference, Columbus OH, May 2017*
67. Yousefi, K. Popat, S. James, L. P. Dasi, "Hemodynamic Assessment of a Novel Biomolecularly Enhanced Polymeric Transcatheter Heart Valve", *Weinstein Conference, Columbus OH, May 2017*
68. Yousefi, P. Maureira, J. Crestanello, L. P. Dasi, "On the In Vitro Hemodynamics of Transcatheter Aortic Valves", *Weinstein Conference, Columbus OH, May 2017*
69. Yousefi, J. Maureira, L. P. Dasi, "A Comparative Study between Transcatheter Aortic Valves Surgical Bioprosthesis: Implications on hemodynamics and durability" *2016 BMES Annual Meeting, Minneapolis, October 2016*.

70. Azimian, J. Dollery, J. Crestanello, and L. P. Dasi, "Predictive Model To Assess Coronary Obstruction During TAVI Implantation", Biomedical Engineering Society (BMES), Minneapolis MN, October 2016.
71. Azimian, J. Dollery, J. Crestanello, and L. P. Dasi, "Assessing Adverse Outcome of Transcatheter Aortic Valve Implantation(TAVI) using Computational Modeling", Weinstein cardiovascular development and regeneration meeting, Columbus OH, May 2017
72. Azimian, S. Lilly, J. Dollery, J. Crestanello, and L. P. Dasi, "Accurate Predictive Model To Assess Coronary Obstruction During TAVR", Transcatheter Valve Therapies (TVT), Chicago IL, June 2017
73. Hatoum H, Dollery J, Lilly S, Crestanello J and Dasi LP. Sub-annular deployment in valve-in-valve compromises pressure gradient and sinus washout. Transcatheter Valve Therapies TVT 2017, Chicago, Illinois, 2017
74. D.Flemister, H.Hatoum, R.Oba, A.Yousefi, J. Crestanello, L.P. Dasi. "Coronary Flow Modulates Aortic Sinus Vortex" 24th Annual Weinstein Cardiovascular Development and Regeneration Conference, Columbus OH, May 2017.
75. D.Flemister, H.Hatoum, R.Oba, A.Yousefi, J. Crestanello, L.P. Dasi. "Effect of Left Versus Right Coronary Flow Waveforms on Aortic Sinus Hemodynamics" Summer Biomechanics, Bioengineering and Biotransport Conference (SB3C2017), Tuscon AZ, June 2017.
76. W. Oba, A. Azimian, A. Yousefi, H. Hatoum, J. Dollery, J. A. Crestanello, L. P. Dasi, "Fluid Dynamics of Patient-Specific Stenotic Aortic Heart Valves," Biomedical Engineering Society Annual Meeting, Minneapolis MN, October 2016.
77. H. Hatoum, A. Yousefi, J. Dollery, J.A. Crestanello and L.P. Dasi, "Patient-Specific Modeling of Transcatheter Aortic Valve Implantation: An In-Vitro Study", Biomedical Engineering Society Annual Conference (BMES), Minneapolis, Minnesota, October 2016)
78. H. Hatoum, A. Yousefi, J. Dollery, J.A. Crestanello, and L.P. Dasi, "In-vitro Hemodynamic assessment of a Patient-Specific Aortic Root Model before and after Transcatheter Aortic Valve Implantation", Weinstein Cardiovascular Development and Regeneration Meeting, Columbus, Ohio, May 2017
79. H. Hatoum, J. Dollery, J.A. Crestanello, and L.P. Dasi, "Pressure Gradient and Leaflet Thrombosis Risk are optimized when the Deployment Valve-in-Valve is Sub-Annular", Weinstein Cardiovascular Development and Regeneration Meeting, Columbus, Ohio, May 2017
80. H. Hatoum, J. Dollery, J.A. Crestanello, and L.P. Dasi, "Effect of Surgical Valve Tissue Ingrowth and Calcification on Valve-in-Valve Hemodynamic Performance", Weinstein Cardiovascular Development and Regeneration Meeting, Columbus, Ohio, May 2017
81. H. Hatoum, J. Dollery, J.A. Crestanello and L.P. Dasi, "Hemodynamic Performance of Valve-in-valve In Calcified Bioprosthetic Valves Is Significantly Different Than In Non-calcified Valves", Summer Biomechanics Bioengineering Biotransport (SB3C), Tucson, Arizona, June 2017)
82. H. Hatoum, J. Dollery, J.A. Crestanello, and L.P. Dasi, "Sub-annular deployment in valve-in-valve is most optimal when considering both pressure gradients and leaflet thrombosis risk", Summer Biomechanics Bioengineering Biotransport (SB3C), Tucson, Arizona, June 2017)

83. M. Heitkemper, H. Hatoum, J. Dollery, J. Crestanello, and L. P. Dasi, "Influence of Cardiac Output Dependent Aortic Valve Area in the Formulation of a Severity Index for Calcified Aortic Valve Stenosis," Weinstein Cardiovascular Development and Regeneration Meeting, Columbus OH, May 2017.
84. M. Heitkemper, H. Hatoum, J. Dollery, J. Crestanello, and L. P. Dasi, "Implication Of Flow Dependence Of Valve Area On The Formulation Of A Severity Index For Calcific Aortic Valve Stenosis," Summer Biomechanics Bioengineering Biotransport (SB3C), Tucson AZ, June 2017.
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183. D.R. Webster, L.P. Dasi and F. Schuerg, "Scale-dependant fractal measures of iso-surfaces of a passive scalar in turbulent boundary layers," *DFD04 Meeting of The American Physical Society*, East Rutherford, NJ, November, 2003. Also Bulletin of American Physical Society, Vol. 49 (2004).
184. L.P. Dasi and D.R. Webster, "Small-scale Characteristics of the Fluctuating Passive Scalar Field in a Turbulent Boundary Layer," *3rd International Symposium on Turbulence and Shear Flow Phenomena*, Sendai, Japan, June 2003.
185. L.P. Dasi and D.R. Webster, "Structure Functions and Multi-point Correlation Functions of a Passive Scalar Field in a Turbulent Boundary Layer," *DFD03 Meeting of The American Physical Society*, East Rutherford, NJ, November, 2003. Also Bulletin of American Physical Society, Vol. 48, No. 10, p. 186 (2003).
186. L.P. Dasi and D.R. Webster, "Scaling Behavior in the Local Structure of Passive Scalar Fields in a Turbulent Boundary Layer," *DFD02 Meeting of The American Physical Society*, Dallas, TX, November, 2002. Also Bulletin of American Physical Society, Vol. 47, No. 10, p. 150 (2002).
187. D.R. Webster, S. Rahman, and L.P. Dasi, "Chemosensory-Mediated Foraging in a Turbulent Boundary Layer," *2nd International Symposium on Turbulence and Shear Flow Phenomena*, Stockholm, Sweden, June 2001.
188. S. Rahman, L.P. Dasi, D.R. Webster, and P.J.W. Roberts, "Characteristics of Turbulent Plumes Using PLIF Technique," *2000 ASCE Joint Conference on Water Resources Engineering and Water Resources Planning & Management*, Minneapolis, MN, August 2000.

189. D.R. Webster, S. Rahman, and L.P. Dasi, "Bilateral Comparison in Chemosensory-Mediated Foraging," *DFD00 Meeting of The American Physical Society*, Washington, DC, November, 2000. Also Bulletin of American Physical Society, Vol. 45, No. 9, p. 190 (2000).
190. L.P. Dasi, and D.R. Webster, "Passive Scalar Distributions in a Turbulent Boundary Layer," *DFD00 Meeting of The American Physical Society*, Washington, DC, November, 2000. Also Bulletin of American Physical Society, Vol. 45, No. 9, p. 110 (2000).
191. D.R. Webster, P.J.W. Roberts, S. Rahman, and L.P. Dasi, "Information Content of Turbulent Chemical Plumes," *DFD99 Meeting of The American Physical Society*, New Orleans, LA, November, 1999. Also Bulletin of American Physical Society, Vol. 44, No. 8, p. 36 (1999).
192. D.R. Webster, P.J.W. Roberts, S. Rahman, and L.P. Dasi, "Simultaneous PIV/PLIF Measurements of a Turbulent Chemical Plume," *1999 International Water Resources Engineering Conference*, Seattle, WA, August 1999.

k) Unpublished Scholarly Presentations (Indicate Whether Peer Reviewed)
Invited Presentations

1. Lakshmi P. Dasi, "Fluid Mechanics of Trans-catheter aortic valve replacement," Center for Environmental and Applied Fluid Mechanics (CEAFM) at Johns Hopkins University, Baltimore, MD, October 2018.
2. Lakshmi P. Dasi, "The Valve is in – What Next?," 6th Annual Structural Heart Disease Conference, The Ohio State University, Wexner Medical Center, Columbus, OH, June 2018.
3. Lakshmi P. Dasi, "Towards precision medicine guidelines for trans-catheter aortic valve replacement therapy," Center for Cardiovascular Research, Colorado State University, Fort Collins, CO, November 2017.
4. Lakshmi P. Dasi and Juan Crestanello, "TAVR or SAVR: Beyond the STS Score," 5th Annual Structural Heart Disease Conference, The Ohio State University, Wexner Medical Center, Columbus, OH, May 2017.
5. Lakshmi P. Dasi, "Trans-catheter heart valve engineering," Big10 Faculty Seminar, University of Illinois Urbana-Champaign, Colorado State University, Urbana, IL, March 2016.
6. Lakshmi P. Dasi, "Emerging trends in aortic valve hemodynamics: A bioengineer perspective. How can we design better transcatheter valves," Invited Klassen Research Day Seminar, Richard M. Ross Heart Hospital, Ohio State University, Columbus, OH, February 2016.
7. Lakshmi P. Dasi, "Relevance of Aortic Valve Sinus Hemodynamics on Native and Prosthetic Aortic Valves," Work in Progress (WIP), Nationwide Children's Hospital, Columbus, OH, December 2015.
8. Lakshmi P. Dasi, "Cardiovascular Biofluid Mechanics: Engineering Cardiac Surgery," Biomedical Engineering Seminar Series, Ohio State University, Columbus, OH, February 2015.
9. Lakshmi P. Dasi, "The Two-Way Street of Cardiovascular Biomechanics: Connecting Basic and Applied/Translational Research," Distinguished Seminar Series, Virginia Tech, Blacksburg, VA, February 2015.
10. Lakshmi P. Dasi, "The Two-Way Street of Cardiovascular Biomechanics: Connecting Basic and Applied/Translational Research," Mechanical Engineering Seminar Series, Iowa State University, Ames, IA, February 2015.
11. Lakshmi P. Dasi, "On the universality of dissipation scales in turbulent flows," Department of Mechanical Engineering, Johns Hopkins University, Baltimore, MD, October 2014.
12. B. Johnson, D. Garrity, and Lakshmi P. Dasi, "Timing of Mechanical Cues Is An Epigenetic Factor Regulating Cardiac Morphogenesis and Function," Reproductive and Women's Health Biomechanics Symposium, World Congress of Biomechanics, Boston MA, July 2014.
13. D. Bark, E. Koenig, and Lakshmi P. Dasi, "The Impact of Added Mass Effect on Mitral Valve Leaflet Constitutive Properties and Mechanics," 17th U.S. National Congress on Theoretical & Applied

Mechanics, Michigan State University, East Lansing, MI, June 15-20, 2014.

14. R. Simon, P. Maureira, M. Dong, Lakshmi P. Dasi, "Advances in Heart Valve Engineering with Special Emphasis on Scaling," 10th International Conference on Pediatric Mechanical Circulatory Support Systems & Pediatric Cardiopulmonary Perfusion, Philadelphia, PA, May 2014.
15. Lakshmi P. Dasi, "Can Turbulence Really Be Universal?," Department of Mechanical Engineering, University of Colorado, Boulder, CO, April 2014.
16. Lakshmi P. Dasi, "Towards designing the ideal artificial heart valve: innovations in biomechanical and biomaterials design," Department of Mechanical and Aerospace Engineering, University of California, San Diego, CA, March 2014.
17. Lakshmi P. Dasi, K.N. Morshed, M. Forleo, "Sub-Kolmogorov Turbulence in Heart Valve Flows: Theory to Predict Distribution of Viscous Shear Stress on Blood Cells, Mathematics Guiding Bioartificial Heart Valve Design, Columbus, Ohio, October 28-31st, 2013.
18. Lakshmi P. Dasi, "On the Hydrodynamic Energy Budget of Multiple Heart Valve Disease?," Department of Chemical and Biological Engineering, Colorado State University, Fort Collins, CO, April 2012.
19. Lakshmi P. Dasi, "Valvular Heart Disease," Heart Center of the Rockies, Poudre Valley Hospital, Fort Collins, CO, August 2011.
20. Lakshmi P. Dasi, "Flow Optimization in Cardiac Problems – From prosthetic device designs to surgical repairs," School of Biomedical Engineering, Colorado State University, Fort Collins, CO, December 2009.
21. Lakshmi P. Dasi, "A Fluid Mechanical Study of Bileaflet Mechanical Heart Valves: Basic Science driven Translational Research," Department of Mechanical Engineering, Colorado State University, Fort Collins, CO, May 2009.
22. Lakshmi P. Dasi, "Problems in Multi-disciplinary Fluid Mechanics: An Example from The Heart," Department of Aerospace Engineering Sciences, University of Colorado, Boulder, CO, April 2009.
23. Lakshmi P. Dasi, "The Fluid Mechanics of Bileaflet Heart Valves and The Application of Flow Control Using Passive, Surface-Mounted Elements," Department of Mechanical Engineering, University of Connecticut, Storrs, CT, March 2008.
24. Lakshmi P. Dasi, Matthew Paden, James Fortenberry, and Ajit Yoganathan, "Assessment of Current CVVH Systems and Validation of a Novel Accurate Fluid Management System for use in Extracorporeal Membrane Oxygenation," Health Systems Institute, Georgia Tech & Emory University, Atlanta, GA, July 2008.

I) Potential publications under review (indicate authorship, date of submission, and to what journal or publisher the work has been submitted)

None

2) List of creative works pertinent to your professional focus

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a) Artwork

None

b) Choreography

None

c) Collections

None

d) Compositions

None

e) Curated Exhibits

None

f) Exhibited Artworks

None

g) Inventions and Patents

1. Method to Minimize the Likelihood of Thrombosis in Heart Valve Implementation (2020).
2. An Embedded Sensor System for Wireless Monitoring of the Functional Status of Implanted Heart Valves (2020)
3. *System and Methods for Predictive Heart Valve Simulation*, U.S. Patent Application , PCT/US17/55046, A. Azimian and L.P. Dasi (2017)
4. *Prosthetic Heart Valve with Tri-Leaflet Design for Use in Percutaneous Valve Replacement Procedures*, U.S. Patent Application 62/565,709 , , A. Yousefi, M. Heitkemper, and L.P. Dasi (2017)
5. *Superhemophobic surfaces with improved hemocompatibility*, U.S. Patent Application , 62/487,711, K. Popat, V. Leszczak, A. Kota, S. Movafaghi, W. Wang, J. Sorkin, L.P. Dasi, D. Bark (2017)
6. *Glycosaminoglycan and synthetic polymer materials for blood-contacting applications*, U.S. Patent Application , 2013030230, S. James, K. Popat, L.P. Dasi, C. Dean, M. Forleo, N. Lewis, (2013)
7. *Flow manipulation device for prosthetic heart valves*, U.S. Patent Application 20080121046, L.P. Dasi, A. Glezer, A.P. Yoganathan,.
8. *Devices and Systems for Medical Fluid Treatment*, U.S. Patent 8821135, M. Paden, L.P. Dasi, and A.P. Yoganathan. (Notice of Allowance issued April 30th 2014).
9. *Fluid management system for accurate continuous hemofiltration in extracorporeal membrane oxygenation (ECMO)*, U.S. Patent 8206594, L.P. Dasi, P. Sucosky, J.D. Fortenberry, M. Paden, and A.P. Yoganathan.
10. *Anatomical Connection*, U.S. Patent 7811244, L.P. Dasi, D.D. Soerenson, K. Pekkan, D. Zelicourt, A.P. Yoganathan,.

h) Moving Image

None

i) Multimedia / Database / Website

None

j) Radio and Television

None

k) Recitals and Performances

None

l) Recordings

None

m) Other Creative Works

None

3) Brief Description of the Focus of the Candidate's Research, Scholarly or Creative Work, Major Accomplishments, and Plans for the Future, including Works in Progress

My core expertise lies in the areas of fluid mechanics and cardiovascular biomechanics. The driving force behind my research pursuits is my passion to tackle “complexity” through the development of elegant analyses. The framework for these analyses must not only facilitate a basic understanding of the complexity in the most meaningful sense but also must translate towards engineering solutions for real world problems. With these fundamental driving principles, I established my research lab named “Cardiovascular & Biofluid Mechanics Laboratory” (CBFL) which has a strong emphasis on cardiovascular bioengineering and mechano-biology. Current focus areas tackle 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. These focus areas represent a broad class of translational problems in my field that are either focused on high-impact bioengineering solutions, physiology, or flow physics. To date, my work has resulted in nearly 75 peer-reviewed journal publications in leading journals in the areas of mechanics and cardiovascular research. As an example of the depth and breadth of my contributions, recent publications tackle: (1) understanding the vortex dynamics of native and trans-catheter 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) the complex structures of ventricular trabeculations using fractal geometry framework, (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). Currently efforts are underway to make impact in translational research and commercialization activities related to artificial valves, and computer based predictive frameworks towards the realization of precision medicine in the field of structural heart diseases.

4) Description of Quality Indicators of Your Research, Scholarly or Creative Work, Such as Citations, Publication Outlet Quality Indicators Such as Acceptance Rates, Rankings or Impact Factors of Journal or Publisher

The journals in which I publish are in the range 0.412 to 79.258. The average impact factor of the journals published in the past three years are 2.835 (2016), 3.926 (2017), and 3.713 (2018), respectively. The total citations (Google Scholar) are 2015 (including journal papers and conference proceeding papers). The H-index is 24, and i10 index is 37.

Journal Impact Factor

Journal Name	Impact Factor	# of Pubs
Annals of Biomedical Engineering	3.405	22
Journal of Thoracic and Cardiovascular Surgery	4.880	11
Journal of Biomechanics	2.431	1

Experiments in Fluids	2.195	1
Cardiovascular Engineering and Technology	1.451	1
Journal of Biomechanical Engineering	1.916	1
Journal of Fluid Mechanics	2.893	2
Annals of Thoracic Surgery	3.779	1
Advanced Healthcare Materials	5.609	1
Physics of Fluids	2.279	1
Journal of the Mechanical Behavior of Biomedical Materials	3.239	1
American Journal of Physiology – Heart and Circulatory Physiology	3.569	1
Biomechanics and Modeling in Mechanobiology	3.212	2
Chaos, Solitons & Fractals	2.231	1
Circulation	19.309	1
Colloids and Surfaces B: Biointerfaces	3.997	1
Fluids	Not Available	3
IEEE Transactions on Bio-Medical Engineering	4.288	1
International Journal of Biomaterials Research and Engineering	Not Available	5
Journal of Biomedical Materials Research Part B: Applied Biomaterials	3.373	6
Journal of Engineering Mechanics	1.799	1
Journal of Heart Valve Disease	0.715	1
Journal of Medical Devices	0.412	1
Langmuir	3.789	2
Limnology and Oceanography	3.595	1
New England Journal of Medicine	79.258	1
Physiological Reports	Not Available	1
PLOS ONE	2.766	1

5) Research Funding

My research has enjoyed continuous funding support from national level research grants from the

National Institutes of Health (NIH), National Science Foundation (NSF), and American Heart Association (AHA). To date, my external funding generated as PI is over \$15M, with an additional \$1.9M as Co-PI. This includes international funding received jointly with NIH and the Indian government towards the development of low-cost heart valves. Another \$7M in new federal and international funding (as PI) is currently pending to further broaden the scope of research undertaken by my lab into the new area of personalized trans-catheter heart valve therapy. I also received certificates and funding from I-Corps@Ohio as well as Accelerator award programs towards technology and startup pursuits. Our research has been reported by national and local media (both print and television) with the main highlight being the effort towards personalized trans-catheter aortic valve therapy at OSU Wexner Medical Center.

a) Funded Research, including Contracts and Clinical Trials, on Which the Candidate is or has been the Principal Investigator

1. 5/2023-4/2027. "Novel Centrifugal LVAD with Wireless Power Transfer and Antithrombotic SLIC Coating". \$7,800,000. Department of Defence. Grant# PR221487 (CDMRP)
2. 2/2022-5/2024. "Optimized Mitral Annuloplasty". \$2,880,000. National Institutes of Health. Grant# R01HL147256
3. 8/2017-7/2023. "Superhydrophobic Prosthetic Heart Valve". \$2,880,000. National Institutes of Health. Grant#R01HL135505
4. 10/2022-9/2024. "Flexible Anti-thrombotic LVADs". \$400,000. National Institutes of Health. Grant# R21EB033960
5. 08/2020-7/2022. "Development of a tissue engineered trans-catheter heart valve for use in the endovascular repair of single ventricle cardiac anomalies in utero". \$125,000.00 Additional Ventures
6. 08/2020-7/2022. "Superomniphobic flow controlled Prosthetic Heart Valve". \$407,519.00 National Institutes of Health. Grant #R21HL139208
7. 8/2013-7/2019. "Hyaluronan enhanced polymeric heart valve prosthesis". \$1,779,184. National Institutes of Health. Grant# R01HL119824
8. 4/2018-3/2019. "Ohio ICorps Program", \$15,000.
9. 1/2017-12/2018. "Hyaluronan Enhanced and Biomechanically Designed Trans-catheter Aortic Valve Prosthesis" \$150,000 National Institutes of Health. Grant#1UH54HL119810-04/NCAI-16-6-APP-OSU-Dasi
10. 1/2018-12/2018. "FDA Presubmission of Polymeric Heart Valve Technology". \$30,000 OSU Accelerator Award.

11. 10/2015-7/2018. "Cost Effective Trileaflet BioPolymeric Heart Valve For India", \$150,000. National Institutes of Health Grant#R03EB014255-01A1. This is a special Indo-US program between NIH and Department of Biotechnology (DBT) to develop low cost prosthetic heart valves.
12. 1/2011-7/2015. "Multiple heart valve disease: one plus one is two?" \$308,000. American Heart Association. Grant# 11SDG5170011.
13. 1/2006-1/2007. "Development of a Novel Fluid Management System for Accurate Continuous Hemofiltration in Extracorporeal Membrane Oxygenation". \$50,000. Health Systems Initiative (HSI) Seed Grant Program, Georgia Tech.

b) Funded Research, including Contracts and Clinical Trials, on Which the Candidate is or has been the Co-Investigator

1. 2017-2019. "Determining how myocardial afterload mediates cardiac valve development", \$140,000. PI: Garrity, American Heart Association.
2. 2014-2015. "Characterization of zebrafish models of filamin C cardiomyopathy", \$60,000. PI: Garrity, NIH/NCATS Colorado CTSI Grant Number UL1 TR001082.
3. 2013-2013. "Wasted Energy of Left Ventricle in Combined Aortic-Mitral Valve Disease", \$4000. PI: Simon-Walker, American Heart Association. Grant #13UFEL17280000.
4. 2012-2015. "Mechanotransduction of Shear Stress and Genetic Response in the Embryonic Heart". \$380,000. PI: Garrity. National Science Foundation. Grant #1235305.
5. 2012-2012. "Wasted Energy of Left Ventricle in Combined Aortic Stenosis and Aortic Regurgitation", \$4000. PI: Simon-Walker, American Heart Association. Grant #12UFEL12160043.
6. 2011-2012. "Developing the Cardiovascular Applications of BioPoly". \$36,386. PI: James. Colorado Office of Economic Development and International Trade.
7. 2011-2014. "Advanced Responsive Low-Fouling Membranes for Water Treatment". \$302,000. PI: Wickramasinghe. National Science Foundation". Grant #1066505.
8. 2009-2011. "Kidney Injury and Dysfunction Support (KIDS)". \$1,000,000. PI: Paden. National Institutes of Health. Grant# RC1DK086939.

c) Proposals for Research Funding that are Pending or were Submitted but not Funded

1. 2019-2026. "Advanced Prosthetic Heart Valve". \$7,170,648 National Institutes of Health. Grant (Pending Council Review of the R35 Mechanism: Impact Score 33)

d) Funded Training Grants on Which the Candidate is or has been the Equivalent of the Principal Investigator

None

e) Proposals for Training Grants that are Pending or were Submitted but not Funded

None

f) Any other Funding Received for the Candidate's Academic work

1. 2018-2023. Wilkinson Family Donation at \$10,000/year for 5 years.
2. 2016-2017 DHRI TriFit Award, \$10,000
3. 2017-2018 DHLRI TriFit Award, \$6,000

6) List of Prizes and Awards for Research, Scholarly or Creative Work

2018.	Mimics Innovation Award
2013	George T. Abell Outstanding Early-Career Faculty Award, College of Engineering, Colorado State University, Fort Collins CO, USA.
2013	Authored one of the most read articles in Physics of Fluids for the month of January.
2011	American Heart Association, National Scientist Development Award.
2008	Best Poster Award Winner, Georgia Life Sciences Summit Conference, Atlanta Georgia.
2007	Article featured in Frontier biophysics Research article, Journal of Biological Physics Research.

Service

1) List of Editorships or Service as an Editorial Reviewer or Board Member for Journals, University Presses, or Other Learned Publications

Associate Editor

2016 - Present	Annals of Biomedical Engineering
2014 – 2018	PLOS One

Journal Reviewer

2018 - Present	PNAS(Manuscript)
2017 - Present	Circulation (Manuscript)
2009 - Present	Annals of Biomedical Engineering (Manuscript)
2009 - Present	Cardiovascular Engineering and Technology (Manuscript)
2009 - Present	Journal of Biomechanical Engineering (Manuscript)

2009 - Present	Experiments in Fluids (Manuscript)
2011 - Present	Journal of Engineering in Medicine (Manuscript)
2014 - Present	Journal of the Royal Society Interface (Manuscript)
2014 - Present	Journal of Thoracic and Cardiovascular Surgery (Manuscript)
2009 - Present	PLOS one (Manuscript)
2013 - Present	Medical & Biological Engineering & Computing (Manuscript)
2011 - Present	Physics of Fluids (Manuscript)
2014 - Present	Computer Methods in Biomechanics and Biomedical Engineering (Manuscript)
2014 - Present	American Journal of Physiology (Manuscript)
2014 - Present	Biomechanics and Modeling in Mechanobiology (Manuscript)

2) List of Offices Held and Other Service to Professional Societies. List of Organization in Which Office was Held or Service Performed. Describe Nature of Organization (Open or Elected Membership, Honorary)

2011 – Present	Member. American Society of Mechanical Engineers. Fluids Committee
2017 – Present	Member. American Society of Mechanical Engineers. Solids Committee
2009 – Present	Member. American Physical Society
2015 – Present	Member. Biomedical Engineering Society
2012 – Present	Member. American Heart Association
2017 – Present	American Society for Engineering Education

3) List of Consultation Activity

None

4) Clinical Services State Specific Clinical Assignments

None

5) Other Professional/Public Community Service directly related to the Candidate's Professional Expertise, if not Listed Elsewhere

Reviewer

2009-Present	ASME Summer Bioengineering meeting reviewer.
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2009-Present	World Biomechanics Conference Reviewer
2015-Present	Biomedical Engineering Society (BMES) Reviewer
2014	Western association of graduate schools (WAGS) University Microfilms International UMI Innovation in Technology Award Review
2018	Served as Expert Witness in a Heart Valve Lawsuit

Conference Participation

1. Organized a mini-symposium and chairing session at the WCB 2018 Conference, Dublin Ireland, July 2018.
2. Organized a symposium and chaired session at the UNSCTAM 2018 Conference in Chicago, June 2018.
3. Chaired Session at Heart Valve Society, New York, NY, 2018.
4. Edited a special issue in Annals of Biomedical Engineering in 2016-2017.
5. Program Committee Member / Reviewer for 2014 Cardiotex; 2nd International Congress on Cardiovascular Technologies, Rome, Italy 25-26 Oct, 2014.
6. World Biomechanics Conference, Singapore 2010, Organized symposia program titled: "Innovative Experimental Techniques to Assess Prosthetic Heart Valve Structure-Function Performance". Includes 1 key note lecture and 3 talks.
7. Co-chaired PhD Student Competition Talks at the 2012 ASME SBC Meeting
8. Co-chaired sessions at SB3C and BMES Meetings

Research

2015,16,17,18	Grant Reviewer, American Heart Association (Bioengineering panel).
2017	Grant Reviewer and Panelist, NIH BMBI Study Section.
2012,14,15	Proposal Reviewer. National Science Foundation (CMMI).
2014	U.S. CRDF, Ad-hoc Reviewer/Referee.
2015	Scientific Research Support Fund (SRSF), Jordan.
2017	Proposal Reviewer, National Center of Science and Technology Evaluation, Kazakhstan
2016,2018	Grant Reviewer, Ministry of Science,.Israel

Service to Student Affairs

2017	Presenter. Engineering in Healthcare: Industry and Research Symposium
2017	Presenter and Moderator of Graduate Engineering Open House

2018

Hosted Minority Underserved High School Student Hana Kassa

6) Administrative Service

a) Unit Committees

Department

2017 - present	Biomedical Engineering, Executive Committee, Member
2017 - present	Biomedical Engineering, Research Committee, Member
2017 – 2018	Biomedical Engineering, Graduate Committee, Member
2016	Biomedical Engineering, Faculty Search Committee, Member
2015 - present	Biomedical Engineering, AP&T Committee. Member
2015 – present	Biomedical Engineering, Computing Service Committee, Member
2014 - 2014	Center for Cardiovascular Research, Executive Committee of Center for Cardiovascular Research, Member
2012 - 2015	School of Biomedical Engineering, Seminar Committee, Member
2010-2013	Mechanical Engineering, Graduate Committee, Member

b) College or University Committees

University

- | | |
|-------------|---|
| 2010 - 2015 | Colorado State University, Alliance for Graduate Education and the Professoriate (AGEP), Member |
| 2011 - 2013 | Colorado State University, Residential Learning Community Advisory Board (RLCAB), Member |

College

- | | |
|-----------|--|
| 2017-2018 | College of Medicine, Chair of Cardiac Surgery, Search Committee Member |
| 2010 | College of Engineering, Dean's Internal Advisory Committee, Member |
| 2011-2012 | College of Engineering, Faculty in Residence at Academic Village Dormitory, Live In Faculty Member |

c) Initiatives Undertaken to Enhance Diversity in your Unit, College or the University

1. Successfully submitted NIH Diversity Supplement to support Mr. Dorma Flemister (Minority Student) as predoctoral trainee in my lab.
2. Served as AGEP Faculty at Colorado State University

d) Administrative Positions Held, e.g. Graduate Studies Chair

None

e) Service as a Graduate Faculty Representative on a Dissertation in another Unit or University

- | | |
|------|---|
| 2018 | Ju Gao. The Ohio State University, Columbus, OH, Graduated. |
| 2017 | Michael Winer. The Ohio State University, Columbus, OH, Graduated. |
| 2016 | Saivash HosseinyAlamdary, The Ohio State University, Columbus, OH, Graduated. |

7) Advisor to Student Groups and Organizations

None.

8) Office of Student Life Committees

a) List Office of Student Life Committees on which You have served

None

b) Summarize participation in Student Life programs such as fireside discussions, lectures to student groups outside of your unit, addresses or participation at student orientations

Faculty Guide. Guided LEGO robotics team (elementary school level) in 2010 from Liberty Common School, Fort Collins CO. They won one of the categories at the state championship (12/2010).

Mentored high-school student in the IB Program Science Project – Artificial heart design.

9) List of prizes and awards for service to your profession, the university or your unit

2018, 2019, 2020 Outstanding Associate Editor, Annals of Biomedical Engineering

10) Brief elaboration that provides additional information about service activities listed above.

My service has steadily transformed from committee memberships since my early days as faculty member to more and more leadership roles not only at the department and university level but also in the biofluid mechanics and cardiovascular biomechanics community. As service to the university and department I have been part of several committees. At OSU, I have currently serving as an elected member of the executive committee of the department chair in addition to serving on departmental committees (e.g. graduate committee, and computers committee) as well as cross-college level search committees. At CSU, I served as a member of the executive committee of the Center for Cardiovascular Research (CCVR) – a collaborative center of CSU and University of Colorado Health. I was also member of the university level NSF funded Alliance for Graduate Education and the Professoriate (AGEP) program.

At the professional level, I am a member of American Physical Society (APS), Biomedical Engineering Society (BMES), American Heart Association (AHA), American Society of Engineering Education (ASEE), and American Society of Mechanical Engineers (ASME). I have regularly served on grant panels of AHA, NSF, NIH, and U.S. Civilian Research and Development Foundation (CRDF). Internationally, I receive grant review requests from Ireland, Israel (BSF), France, and Kazakhstan. I currently serve as Associate Editor of the BMES's flagship journal named Annals of Biomedical Engineering. I previously served as Academic Editor for PLOS ONE journal. Lastly, I actively organize sessions, and symposiums related to heart valve engineering at national and international meetings such as at the World Congress of Biomechanics, Summer Biomechanics, Bioengineering, and Biotransport (SB3C) Conference, BMES annual conference, Heart Valve Society, and the U.S. National Congress for Theoretical and Applied Mechanics.

With regards to community outreach, I have been involved in several educational outreach programs to local school students and undergraduate students. Currently my lab is hosting an under-represented high school student from the Columbus area for research experience. I have previously served as faculty guide to the LEGO robotics team (elementary school level) from Liberty Common School, Fort Collins CO, which eventually went on to win one of the categories at the state level championship. At the high school level,

I have mentored two students for the International Baccalaureate Program's science projects. At CSU, I served as Faculty in Residence in the undergraduate dorm – Academic Village where I organized outreach activities for freshman engineering students. Finally, at OSU's Wexner Medical Center, my lab regularly participates at the Structural Heart Conference and delivers talks for Continuing Medical Education (CME) credits for entire Ohio structural heart clinical community.

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