Ashish Manohar

University of California San Diego
Postdoctoral Scholar
Department of Bioengineering
Altman Clinical and Translational Research Institute

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RESEARCH INTEREST

Medical imaging	Cardiac CT	Cardiac mechanics
4DCT	Modeling	Motion correction

EDUCATION

Doctor of Philosophy, Engineering Sciences 2017-2022
Mechanical Engineering, UC San Diego
Thesis: Spatio-temporal resolution of regional cardiac function assessment with four-dimensional computed tomography
Advisor: Dr. Elliot R. McVeigh
GPA: 3.93/4.0

Master of Science, Engineering Sciences 2015-2017
Mechanical Engineering, UC San Diego
Thesis: Estimation of regional left ventricular function based on texture analysis of computed tomography images
Advisor: Dr. Juan Carlos del Alamo
GPA: 3.92/4.0

Bachelor of Engineering, Mechanical Engineering 2011-2015
R.V. College of Engineering, Bangalore, India
GPA: 8.62/10.0

RESEARCH EXPERIENCE

Cardiovascular Imaging Lab, UC San Diego 2017-present
Graduate Student Researcher

- Spatio-temporal resolution of 4DCT for regional cardiac function assessment
- Modeling cardiac mechanics
- 4DCT for guiding cardiac resynchronization therapy

del Alamo Research Group, UC San Diego 2015-2017
Graduate Student Researcher

- Texture analysis of cardiac muscle walls
- Regional values of fractal dimension as surrogate markers of left ventricular function

Micro Air Vehicle Unit, National Aerospace Laboratories 2014-2015
Research Intern

- Design and fabrication of flapping wing micro air vehicles
- Asymmetric flapping for differential thrust generation

AWARDS

- **American Heart Association Predoctoral Fellowship**, 2020
- **Siemens Young Scientist Award**, SPIE Medical Imaging, 2019

REVIEW ACTIVITIES

- PLOS One
- Medical Physics

LEADERSHIP & MENTORING EXPERIENCE

- **UCSD MAE Mentoring Program**, Mentor, 2021-present
- **Jacobs School of Engineering Undergraduate Mentoring Program**, Mentor, 2020-present
- **UCSD International Graduate Student Mentoring Program**, Mentor, 2019-present
- **UCSD Mechbio Symposium 2016**, Lead Student Organizer

TEACHING EXPERIENCE

- Fall 2016: Teaching Assistant, Fluid mechanics (CENG 101A)
  Received 80% positive student evaluations
- Summer 2016: Instructor, Introduction to fluid mechanics (UCSD Academic Connections)
  Designed course curriculum and taught a class of 15 students between the 9-12 grades
- Winter 2017: Teaching Assistant, Fluid mechanics (MAE 101A)
  Received 100% positive student evaluations
- Fall 2017: Teaching Assistant, Aerodynamics (MAE 104)
  Received 100% positive student evaluations
- Winter 2018: Teaching Assistant, Fluid mechanics (MAE 101B)
  Received 100% positive student evaluations
- Spring 2018: Teaching Assistant, Advanced cardiac imaging (BENG 207)
  Student evaluations not applicable
- Fall 2018: Teaching Assistant, Biomedical imaging (BENG 280A)
  Received 100% positive student evaluations
- Spring 2019: Teaching Assistant, Imaging cardiovascular disease (BENG 280C)
  Received 100% positive student evaluations
- Spring 2020: Teaching Assistant, Imaging cardiovascular disease (BENG 280C)
  Received 100% positive student evaluations

PUBLICATIONS (* denotes equal contribution)

1. **Ashish Manohar**, Gabrielle Colvert, James Yang, Zhennong Chen, Maria Ledesma-Carbayo, Mads Brix Kronborg, Anders Sommer, Bjarne Linde Nørgaard, Jens Cosedis Nielsen, and Elliot McVeigh, "Prediction of CRT response using a lead placement score derived from 4DCT", *Circulation: Cardiovascular Imaging*, 2022 (under revision).
2. **Ashish Manohar***, Gabrielle Colvert*, Juan Ortuño, Zhennong Chen, James Yang, Brendan Colvert, Patricia Bandettini, Marcus Chen, Maria Ledesma-Carbayo, and Elliot McVeigh, "Regional left ventricular endocardial strains estimated from low-dose 4DCT: comparison with cardiac magnetic resonance feature tracking", *Medical Physics*, 2022.
3. Zhennong Chen, Francisco Contijoch, Gabrielle Colvert, **Ashish Manohar**, Andrew Kahn, Hari Narayan, and Elliot McVeigh, "Detection of Left Ventricular Wall Motion Abnormalities from Volume Rendering of 4DCT Cardiac Angiograms Using Deep Learning", *Frontiers in Cardiovascular Medicine*, 2022.
4. Jed Pack, **Ashish Manohar**, Sathish Ramani, Bernhard Claus, Zhye Yin, Francisco Contijoch, Andrew Schluchter, and Elliot McVeigh, "Four-dimensional computed tomography of the left ventricle, part I: motion artifact reduction", *Medical Physics*, 2022.
5. **Ashish Manohar**, Jed Pack, Andrew Schluchter, and Elliot McVeigh, "Four-dimensional computed tomography of the left ventricle, part II: estimation of mechanical activation times", *Medical Physics*, 2022.

6. Gabrielle Colvert, **Ashish Manohar**, Francisco Contijoch, James Yang, Jeremy Glynn, Philipp Blanke, Jonathan Leipsic, and Elliot McVeigh, "Novel 4DCT method to measure regional left ventricular endocardial shortening before and after transcatheter mitral valve implantation", *Structural Heart*, 2021.
7. **Ashish Manohar**, Gabrielle Colvert, Andrew Schluchter, Francisco Contijoch, and Elliot McVeigh, "Anthropomorphic left ventricular mesh phantom: a framework to investigate the accuracy of SQUEEZ using Coherent Point Drift for the detection of regional wall motion abnormalities", *Journal of Medical Imaging*, 2019.
8. **Ashish Manohar**, Lorenzo Rossini, Gabrielle Colvert, Davis Vigneault, Francisco Contijoch, Marcus Chen, Juan Carlos del Alamo, and Elliot McVeigh, "Regional dynamics of fractal dimension of the left ventricular endocardium from cine computed tomography images", *Journal of Medical Imaging*, 2019.

IN PREPARATION

1. **Ashish Manohar**, James Yang, Jed Pack, and Elliot McVeigh, "Estimation of left ventricular mechanical activation times from motion-corrected cardiac 4DCT images".
2. Zhennong Chen, Francisco Contijoch, Andrew Kahn, Seth Kligerman, Hari Narayan, **Ashish Manohar**, and Elliot McVeigh, "Thresholding of regional shortening measured from 4D cardiac CT angiograms accurately detects the presence of LV wall motion abnormalities".

CONFERENCE PROCEEDINGS & PRESENTATIONS

1. Gabrielle Colvert, **Ashish Manohar**, Jeremy Glynn, and Elliot McVeigh, "Characterization of changes in 4DCT-derived regional left ventricular function before and 1-month after transcather mitral valve implantation", *70th Annual Scientific Session of the American College of Cardiology*, May 2021, Atlanta, USA.
2. **Ashish Manohar**, Andrew Schluchter, Francisco Contijoch, and Elliot McVeigh, "Anthropomorphic dyssynchronous LV phantom: a framework to investigate the assessment of LV dyssynchrony using 4DCT-SQUEEZ", *15th Annual Scientific Meeting of the Society of Cardiovascular Computed Tomography*, July 2020, Seattle, USA.
3. **Ashish Manohar**, Gabrielle Colvert, Francisco Contijoch, and Elliot McVeigh, "Quantitative assessment of localized regional wall motion abnormalities from 4DCT: recursive estimation of SQUEEZ (reSQUEEZ)", *14th Annual Scientific Meeting of the Society of Cardiovascular Computed Tomography*, July 2019, Baltimore, USA.
4. Gabrielle Colvert, **Ashish Manohar**, Brendan Colvert, Francisco Contijoch, and Elliot McVeigh, "Analysis of longitudinal and circumferential strain on the endocardial surface using 4DCT", *14th Annual Scientific Meeting of the Society of Cardiovascular Computed Tomography*, July 2019, Baltimore, USA.
5. **Ashish Manohar**, Gabrielle Colvert, Andrew Schluchter, Francisco Contijoch, and Elliot McVeigh, "LV systolic point-cloud model to quantify accuracy of CT derived regional strain", *Medical Imaging 2019: Image-Guided Procedures, Robotic Interventions, and Modeling*, February 2019, San Diego, USA.
6. Gabrielle Colvert, **Ashish Manohar**, Brendan Colvert, Andrew Schluchter, Francisco Contijoch, and Elliot McVeigh, "Novel measurement of LV twist using 4DCT: quantifying accuracy as a function of image noise", *Medical Imaging 2019: Biomedical Applications in Molecular, Structural, and Functional Imaging*, February 2019, San Diego, USA.
7. **Ashish Manohar**, Lorenzo Rossini, Gabrielle Colvert, Davis Vigneault, Francisco Contijoch, Marcus Chen, Juan Carlos del Alamo, and Elliot McVeigh, "Changes in fractal dimension of the LV endocardium are reduced in myocardial dysfunction", *91st Annual Scientific Session of the American Heart Association*, November 2018, Chicago, USA.

REFERENCES

1. Dr. Elliot McVeigh
   Professor
   Department of Bioengineering, UC San Diego
   emcveigh@eng.ucsd.edu

2. Dr. Juan Carlos del Alamo
   Professor
   Department of Mechanical Engineering, University of Washington
   juancar@uw.edu

3. Dr. Francisco Contijoch
   Assistant Professor
   Department of Bioengineering, UC San Diego
   fcontijoch@eng.ucsd.edu

4. Dr. Jed Pack
   Senior Imaging Scientist
   GE Global Research
   jed.pack@ge.com