

Stanford



Karthik Menon

Postdoctoral Scholar, Cardiology

Bio

BIO

Karthik Menon is a postdoctoral scholar in the Cardiovascular Biomechanics Computation Laboratory at Stanford University, advised by Alison Marsden. His current research involves the development of computational methods for accurate patient-specific cardiovascular blood flow simulations and uncertainty quantification. He graduated with a Ph.D. in Mechanical Engineering from Johns Hopkins University in 2021, where his doctoral work focused on the flow physics of fluid-structure interactions. His broad research interests include fluid mechanics, computational modeling and data-driven methods.

HONORS AND AWARDS

- WCCM-PANACM Travel Award, U.S. Association for Computational Mechanics (2024)
- Future Faculty Symposium Travel Award, Society of Engineering Science Conference (2023)
- Mark O. Robbins Prize in High-Performance Computing, Johns Hopkins University (2021)
- Corrsin-Kovaszny Outstanding Paper Award, Center for Environmental and Applied Fluid Mechanics, Johns Hopkins University (2020)
- Prosperetti Travel Award, Johns Hopkins University (2017)
- Departmental Fellowship, Mechanical Engineering, Johns Hopkins University (2016)
- Summer Research Fellowship, Indian Academy of Sciences (2014)

PROFESSIONAL EDUCATION

- Doctor of Philosophy, Johns Hopkins University (2021)
- Bachelor of Engineering, Birla Institute of Technology and Science (2015)
- Master of Science, Johns Hopkins University (2019)

STANFORD ADVISORS

- Alison Marsden, Postdoctoral Faculty Sponsor

LINKS

- Google Scholar: <https://scholar.google.com/citations?user=CmIqL14AAAAJ&hl=en>

Publications

PUBLICATIONS

- **Cardiovascular fluid dynamics: a journey through our circulation** *FLOW*
Menon, K., Hu, Z., Marsden, A. L.
2024; 4

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- **Personalized coronary and myocardial blood flow models incorporating CT perfusion imaging and synthetic vascular trees.** *Npj imaging*
Menon, K., Khan, M. O., Sexton, Z. A., Richter, J., Nguyen, P. K., Malik, S. B., Boyd, J., Nieman, K., Marsden, A. L.
2024; 2 (1): 9
 - **A probabilistic neural twin for treatment planning in peripheral pulmonary artery stenosis.** *International journal for numerical methods in biomedical engineering*
Lee, J. D., Richter, J., Pfaller, M. R., Szafron, J. M., Menon, K., Zaroni, A., Ma, M. R., Feinstein, J. A., Kreutzer, J., Marsden, A. L., Schiavazzi, D. E.
2024: e3820
 - **Force moment partitioning and scaling analysis of vortices shed by a 2D pitching wing in quiescent fluid** *EXPERIMENTS IN FLUIDS*
Zhu, Y., Lee, H., Kumar, S., Menon, K., Mittal, R., Breuer, K.
2023; 64 (10)
 - **Personalized coronary and myocardial blood flow models incorporating CT perfusion imaging and synthetic vascular trees.** *medRxiv : the preprint server for health sciences*
Menon, K., Khan, M. O., Sexton, Z. A., Richter, J., Nieman, K., Marsden, A. L.
2023
 - **Predictors of Myocardial Ischemia in Patients with Kawasaki Disease: Insights from Patient-Specific Simulations of Coronary Hemodynamics.** *Journal of cardiovascular translational research*
Menon, K., Seo, J., Fukazawa, R., Ogawa, S., Kahn, A. M., Burns, J. C., Marsden, A. L.
2023
 - **Contribution of spanwise and cross-span vortices to the lift generation of low-aspect-ratio wings: Insights from force partitioning** *PHYSICAL REVIEW FLUIDS*
Menon, K., Kumar, S., Mittal, R.
2022; 7 (11)
 - **A method for partitioning the sources of aerodynamic loading noise in vortex dominated flows** *PHYSICS OF FLUIDS*
Seo, J., Menon, K., Mittal, R.
2022; 34 (5)
 - **Investigation of aerodynamic instability vibration of rectangular cylinder based on energy transfer** *JOURNAL OF WIND ENGINEERING AND INDUSTRIAL AERODYNAMICS*
Noda, H., Mittal, R., Seo, J., Menon, K.
2022; 220
 - **Significance of the strain-dominated region around a vortex on induced aerodynamic loads** *JOURNAL OF FLUID MECHANICS*
Menon, K., Mittal, R.
2021; 918
 - **On the initiation and sustenance of flow-induced vibration of cylinders: insights from force partitioning** *JOURNAL OF FLUID MECHANICS*
Menon, K., Mittal, R.
2021; 907
 - **Quantitative analysis of the kinematics and induced aerodynamic loading of individual vortices in vortex-dominated flows: a computation and data-driven approach** *JOURNAL OF COMPUTATIONAL PHYSICS*
Menon, K., Mittal, R.
2021; 443
 - **Aeroelastic response of an airfoil to gusts: Prediction and control strategies from computed energy maps** *JOURNAL OF FLUIDS AND STRUCTURES*
Menon, K., Mittal, R.
2020; 97
 - **Dynamic mode decomposition based analysis of flow over a sinusoidally pitching airfoil** *JOURNAL OF FLUIDS AND STRUCTURES*
Menon, K., Mittal, R.
2020; 94
 - **Aerodynamic Characteristics of Canonical Airfoils at Low Reynolds Numbers** *AIAA JOURNAL*
Menon, K., Mittal, R.

2020; 58 (2): 977-980

- **Flow physics and dynamics of flow-induced pitch oscillations of an airfoil** *JOURNAL OF FLUID MECHANICS*

Menon, K., Mittal, R.

2019; 877: 582-613

- **Phase separation and coexistence of hydrodynamically interacting microswimmers** *SOFT MATTER*

Blaschke, J., Maurer, M., Menon, K., Zoetl, A., Stark, H.

2016; 12 (48): 9821-9831

- **Attraction-induced jamming in the flow of foam through a channel** *SOFT MATTER*

Menon, K., Govindarajan, R., Tewari, S.

2016; 12 (37): 7772-7781