

# Muralikrishnan Gopalakrishnan Meena

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## EDUCATION

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### University of California, Los Angeles, USA

Ph.D., Mechanical Engineering, minor in Applied Mathematics

Advisor: Prof. Kunihiko Taira

*January 2019 - June 2020*

### Florida State University, U.S.A

Master of Science, Mechanical Engineering

Advisor: Prof. Kunihiko Taira

*August 2015 - December 2018*

### Cochin University of Science & Technology, India

Bachelor of Technology, Mechanical Engineering

Advisor: Mr. Madhu Anantharajan

*June 2010 - May 2014*

## RESEARCH AREAS OF INTEREST

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• Computational Fluid Dynamics • Network theory • Turbulence • Unsteady aerodynamics • Atmospheric turbulence & climate modeling • Flow control • Reduced-order modeling • Data-based analysis • Machine learning

## WORK EXPERIENCE

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### Oak Ridge National Laboratory

• Postdoctoral Research Associate

*July 2020 - Present*

### University of California, Los Angeles

• Graduate Research Assistant

*January 2019 - June 2020*

### Florida State University

• Graduate Research Assistant

• Teaching Assistant: EML 4930 Numerical Methods for Engineers (Spring 2016, 2017)

*August 2015 - December 2018*

## JOURNAL PUBLICATION

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Google Scholar: <https://scholar.google.com/citations?user=2yNLfcsAAAAJhl=en>

C.-A. Yeh, **M. Gopalakrishnan Meena**, and K. Taira, "Network broadcast mode analysis and control of turbulent flows", *in review*, 2020

**M. Gopalakrishnan Meena** and K. Taira, "Identifying vortical network connectors for turbulent flow modification", *in review*, 2020

Z. Bai, N. B. Erichson, **M. Gopalakrishnan Meena**, K. Taira, and S. L. Brunton, "Randomized methods to characterize large-scale vortical flow network", *PLOS One*, 14(11), e0225265, 2019

**M. Gopalakrishnan Meena**, A. G. Nair, and K. Taira, "Network community-based model reduction for vortical flows", *Physical Review E*, 97, 063103, 2018

**M. Gopalakrishnan Meena**, K. Taira, and K. Asai, "Airfoil wake modification with Gurney flap at low-Reynolds number", *AIAA Journal*, 56(4), 1348-1359, 2018

## CONFERENCE PUBLICATION

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**M. Gopalakrishnan Meena** and K. Taira, “Characterizing influential networked structures in isotropic turbulence,” 11th International Symposium on Turbulence and Shear Flow Phenomena, Southampton, UK, July 30 - Aug. 2, 2019 (TSFP 11 235)

**M. Gopalakrishnan Meena**, K. Taira, and K. Asai, “Low Reynolds number wake modification using a Gurney flap,” 55th AIAA Aerospace Sciences Meeting, Grapevine, TX, Jan. 9-13, 2017 (AIAA 2017-0543)

**M. Gopalakrishnan Meena**, A. Anandakrishnan, and M. A. Kavumcheril. “Numerical study on heat transfer and fluid flow in pin fin-dimple channels with fillet on dimple edge”, ASME Gas Turbine India Conference, New Delhi, India, Dec. 15-17, 2014 (GTINDIA2014-8103)

## CONFERENCE TALKS

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**M. Gopalakrishnan Meena** and K. Taira, “Network-based identification of influential structures to modify turbulent flows,” *Network Science for Fluid Dynamics*, virtual workshop, June 24-25, 2020

**M. Gopalakrishnan Meena** and K. Taira, “Network-based identification of influential structures to modify turbulent flows,” *72th Annual Meeting of the APS Division of Fluid Dynamics*, Seattle, WA, Nov. 23-26, 2019 (H10.00010)

**M. Gopalakrishnan Meena** and K. Taira, “Characterizing influential networked structures in isotropic turbulence,” 11th International Symposium on Turbulence and Shear Flow Phenomena, Southampton, UK, July 30 - Aug. 2, 2019 (TSFP 11 235)

**M. Gopalakrishnan Meena** and K. Taira, “Characterizing three-dimensional homogenous isotropic turbulence network”, *SoCal Fluids XIII*, UC Santa Barbara, 20 April, 2019

Z. Bai, N. B. Erichson, **M. Gopalakrishnan Meena**, K. Taira, and S. L. Brunton, “Sparse and randomized sampling methods for scalable turbulent flow networks,” *71th Annual Meeting of the APS Division of Fluid Dynamics*, Atlanta, GA, Nov. 18-20, 2018 (G01.00004)

**M. Gopalakrishnan Meena** and K. Taira, “High-dimensional turbulence network characterization and modeling”, *NetSci Conference*, Paris, France, June 13-15, 2018 (140)

K. Taira, **M. Gopalakrishnan Meena**, and A. G. Nair, “Community-based model reduction of unsteady vortical flows”, *NetSci Conference*, Paris, France, June 13-15, 2018 (135)

**M. Gopalakrishnan Meena**, A. G. Nair, and K. Taira, “Vortex network community based reduced-order force model,” *70th Annual Meeting of the APS Division of Fluid Dynamics*, Denver, CO, Nov. 19-21, 2017 (M1.00005)

**M. Gopalakrishnan Meena**, A. G. Nair, and K. Taira, “Network representation and analysis of bluff body wake,” *SIAM Conference on Computational Science and Engineering*, Atlanta, GA, Feb. 27-Mar. 3, 2017 (MS110)

**M. Gopalakrishnan Meena**, K. Taira, and K. Asai, “Low Reynolds number wake modification using a Gurney flap,” *55th AIAA Aerospace Sciences Meeting*, Grapevine, TX, Jan. 9-13, 2017 (AIAA 2017-0543)

A. G. Nair, **M. Gopalakrishnan Meena**, and K. Taira, “Vortical and modal network analysis of unsteady cylinder wake,” *69th Annual Meeting of the APS Division of Fluid Dynamics*, Portland, OR, Nov. 20-22, 2016 (E8.00004)

**M. Gopalakrishnan Meena**, A. Anandakrishnan, and M. A. Kavumcheril. “Numerical study on heat transfer and fluid flow in pin fin-dimple channels with fillet on dimple edge”, ASME Gas Turbine India Conference, New Delhi, India, Dec. 15-17, 2014 (GTINDIA2014-8103)

## TECHNICAL SKILLS

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**Scientific Computing:** CFD solvers (*immersed boundary method, finite difference & volume, spectral, LES*), parallel computation (*MPI, bash scripting, various HPC systems*), ANSYS (*FLUENT, Mechanical APDL, ICEM CFD*), machine learning (*Packages: PyTorch, TensorFlow (Keras); Models: multilayer perceptron, convolution neural network*)

**Programming Languages:** C, C++, Fortran, Matlab, Python

**Design:** Solidworks, Tecplot, Pointwise, OmniGraffle

**Other:** MS Office (*Word, PowerPoint, Excel*), LaTeX, scientific writing (*journal paper, technical & lab reports*), technical presentation, public speaking, academic mentoring (*NSF-REU*)

## PROFESSIONAL SERVICES

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### Journal Referee

- *Journal of Fluid Mechanics*
- *AIAA Journal*
- *Physica D*
- *Physics Letters A*