J V Ramana Reddy

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Date of Birth (Age): April 22, 1989 (34 years)
Gender: Male
Nationality: Indian

Education

- **Defence Institute of Advanced Technology(DU), Department of Applied Mathematics** — Pune, India
  PhD (Research area: Bio-fluid dynamics, Mathematical Biology) — Aug 2011 - Dec 2016
- **University of Hyderabad** — Hyderabad, India
  Master of Science, Applied Mathematics — Jul 2009 - Jul 2011
- **Silver Jubilee Government College**, **Sri Krishnadevaraya University** — Kurnool, India
  Bachelor of Sciences, Mathematics — Apr 2006 - Apr 2009

Professional Experience

- Assistant Professor — Dec 2020 - Present
  AIMR, Tohoku University, Japan
- **Thesis Supervisor at UpGrad Online Higher Education company** — Dec 2019 - Present
- **Post-doctoral Fellow** — Jan 2018 - Feb 2020
  Indian Institute of Technology (IIT), Madras, India
  I have taught the following undergraduate courses at IIT Madras, along with my research work.
  - Preparatory courses (MAPCT0)
  - Functions of several variables (MA1101)
  - Series and Matrices (MA1102)
  - Linear Algebra with Numerical Analysis (MA2030)

Research Experience

- **Post-Doctoral Fellow** — Feb 2020 - Nov 2020
  Kangwon National University, Fluid Engineering Laboratory — Chuncheon, Korea
  Worked with Prof. Hojin Ha
  Title: Biotherapeutics safety test guideline development using 3D organ and in silico organ physiome model.
- **Post-Doctoral Fellow** — Jan 2018 - Feb 2020
  Indian Institute of Technology Madras, **Department of Mathematics** — Chennai, India
  Worked with Prof. S Sundar
  Title: Mathematical analysis of the blood flow turbulence intensity for earlier detection of stroke risk.
- **Research Associate** — Sep 2017 - Jan 2018
  Indian Institute of Technology Kharagpur, **Department of Mathematics** — Kharagpur, India
  Worked with Prof. G P Raja Sekhar and Dr. P Sekhar Burada
  Title: Locomotion of Microorganisms under External Gradients
- **Research Associate** — Sep 2016 to Sep 2017
  Defence Institute of Advanced Technology(DU), DIAT - DRDO Project — Pune, India
  Worked with Dr. D Srikanth and Prof. Samir Kumar Das
  Title: Non-Newtonian nanofluid model for blood flow through Asymmetric, tapered stenotic dynamic artery in the presence of catheter
- **PhD Research Student** — Aug 2011 - Dec 2016
  Defence Institute of Advanced Technology(DU), Department of Applied Mathematics — Pune, India
  Dr. D Srikanth(Supervisor); Dr. SVSSNVG Krishna Murthy (Co-Supervisor)
  Title: Mathematical Modelling of Blood Flow through Stenotic Tapered Arteries

Technical Strengths

Programming: Python, R, FORTRAN, Octave, MATLAB, Mathematica, OpenFOAM, SALOME
Tools: VMTK, Ansys, FreeCAD, SolidWorks, Mimics, 3D-Slicer, ITK-SNAP, CRIMSON, Meshmixer, MeshLab
Libraries: Pandas, NumPy, Scikit-Learn, Matplotlib, Seaborn, Keras, Plotly, PIL
ML & Statistics: Regression, Clustering, Classification, Prediction, Neural Networks
Visuvalization Tools: Paraview, Origin, Tecplot
Documentation Tools: LaTeX, HTML, CSS, Python, Office
Natural Language: English (Fluent) ; Telugu (Native Speaker) ; Hindi (Near-Native speaker) ; Sanskrit (Basic)

Publications/Conferences Proceedings

Journal articles

13. **JV Ramana Reddy**, Hojin Ha, S Sundar. Mathematical investigation of drug dispersion in the blood flow through Stenotic-Aneurysm tapered blood vessel. *International Journal of Modelling and Simulation*, 1-28, 2023. DOI:10.1080/02286203.2023.2238958
12. Supriya Karmakar, R. Usha, Geetanjali Chattopadhyay, Severine Millet, **JV Ramana Reddy**, Priyanka Shukla. Stability of a plane Poiseuille flow in a channel bounded by anisotropic porous walls. *Physics of Fluids*, 34(3): 034103, 2022. DOI:10.1063/5.0083217
11. **JV Ramana Reddy**, Hojin Ha, S Sundar. Modelling and simulation of fluid flow through stenosis and aneurysm blood vessel: A computational hemodynamic analysis. *Computer Methods in Biomechanics and Biomedical Engineering*, 1-23, 2023. DOI:10.1080/10255842.2022.2112184
10. **J. V. R. Reddy**, D. Srikanth, S. K. Murthy. Mathematical modelling of couple stresses on fluid flow in constricted tapered artery in the presence of slip velocity - Effects of catheter. *Applied Mathematics and Mechanics*, 35(8): 947 – 958, 2014. DOI:10.1007/s10483-014-1848-7
9. **J. V. Ramana Reddy**, D. Srikanth, SVSSNVG Krishna Murthy. Mathematical modelling of pulsatile flow of blood through catheterized unsymmetric stenosed artery - Effects of tapering angle and slip velocity. *European Journal of Mechanics B/Fluids*, 48: 236 – 244, 2014. DOI:10.1016/j.euromechflu.2014.07.001
8. D. Srikanth, **J. V. Ramana Reddy**, Shubha Jain, Anup Kale. Unsteady polar fluid model of blood flow through tapered overlapping stenosed artery: Effects of catheter and velocity slip, *Ain Shams Engineering Journal*, 6(3): 1093 – 1104, 2015. DOI:10.1016/j.asej.2015.01.003
7. **J. V. Ramana Reddy**, D. Srikanth. The polar fluid model for blood flow through a tapered artery with overlapping stenosis - Effects of catheter and velocity slip. *Applied Bionics and Biomechanics*, 2015: Article ID 174387, 2015. DOI:10.1155/2015/174387
6. **J. V. Ramana Reddy**, D. Srikanth, SVSSNVG Krishna Murthy. Mathematical modelling of time dependent flow of non-Newtonian fluid through unsymmetric stenotic tapered artery: Effects of catheter and slip velocity. *Meccanica*, 51(1): 55 – 69, 2016. DOI:10.1007/s11012-015-0201-5
5. **J. V. Ramana Reddy**, D. Srikanth, P. K. Mandal. *Computational hemodynamic analysis of flow through flexible permeable stenotic tapered artery*, *International Journal of Applied and Computational Mathematics*, 3(1): 1261 – 1287, 2017. DOI:10.1007/s40819-017-0415-4
4. **J. V. Ramana Reddy**, D. Srikanth, Samir K Das. Modelling and simulation of temperature and concentration dispersion in couple stress nano fluid flow through stenotic tapered arteries. *European Physical Journal Plus*, 132(8): 365. 2017. DOI:10.1140/epjp/i2017-11643-1
3. KM. Surabhi, **J. V. Ramana Reddy**, D. Srikanth. Impact of temperature and concentration dispersion on the physiology of blood nano-fluid – Links to atherosclerosis. *Sadhana*, 43(12): 210. 2018. DOI:10.1007/s12046-018-0986-8
2. **J. V. Ramana Reddy**, D. Srikanth. Modelling and simulation of micropolar fluid flow with variable viscosity through unhealthy artery. *World Journal of Modelling and Simulation*, 14(3): 225. 2018.
1. **J. V. Ramana Reddy**, D. Srikanth. Impact of blood vessel wall flexibility on the temperature and concentration dispersion. *Journal of Applied and Computational Mechanics*, 6(3): 564. 2020. DOI:10.22055/JACM.2019.29023.1542

Articles in under review

1. **J. V. Ramana Reddy**, Toshitaka Watanabe, Hiroshi Suito, Taro Hayashi. *Patient Risk Assessment Post-Type-A Aortic Dissection Surgery through Shape Analysis and Machine Learning*, Radiology, Under revision

Conference Proceedings

3. **J. V. Ramana Reddy**, D. Srikanth and SVSSNVG Krishna Murthy. Shear stress distribution at the wall of $\omega-$shape stenotic tapered artery in the presence of catheter and velocity slip - Effects of polar fluid. In *proceedings of the International Conference on Frontiers in Mathematics (ICFM)*, pages 56–59, 2015. ISBN: 978-81-928118-9-5

2. Shubha jain, Anup Kale, D. Srikanth, **J. V. Ramana Reddy**. Analysis of resistance to the steady flow of blood through tapered overlapping stenosed artery in the presence of catheter and slip velocity. In *International Conference on Mathematical Sciences (ICMS)*, pages 332–335, 2014. ISBN–978-93-5107-261-4
1. **J. V. R. Reddy**, D. Srikanth and Krishna Murthy SVSSNVG. Resistance to the flow of micropolar fluid through unsymmetric stenosed artery - Effects of catheter and slip velocity. In *proceedings of 57th Indian Society of Theoretical and Applied Mechanics (ISTAM)* , 251–257, 2012.

Poster Presentation

1. **J. V. Ramana Reddy**, Toshitaka Watanabe, Hiroshi Suito, Taro Hayashi. Type-A Aortic Dissection Patients' Risk Prediction with Machine Learning, in *4th "Medicine and Mathematics" Study Group*, Sep 29 - 30, 2023, **Japan**.

Conference oral presentations

11. J V Ramana Reddy, Toshitaka Watanabe, Taro Hayashi, Hiroshi Suito. "Comprehensive risk assessment of patients following type-A aortic dissection surgery: A shape analysis and machine learning approach", Presentation in 9$^{\text{th}}$ European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS), June 3 - 7, 2024, Lisboa, **Portugal**.
10. J V Ramana Reddy, Hojin Ha. "Fontan hemodynamics from 29 patient-specific cardiac magnetic resonance studies: A computational fluid dynamics", Presentation in MathGroup Seminar, Apr 23, 2021, Tohoku University, **Japan**.
9. J V Ramana Reddy, Hojin Ha, S Sundar. "Modelling and simulation of blood flow through stenosis and aneurysm blood vessel - An application to drug delivery", Presentation in 11$^{\text{th}}$ National Congress on Fluids Engineering (NCFE) - 2020, Aug 12 - 15, 2020, **South Korea**.
8. J V Ramana Reddy, S Sundar. "Numerical simulation of concentration dispersion in the blood flow through Bio-Absorbable Nanoparticles – An application to target drug delivery", Presented in 9$^{\text{th}}$ International Congress on Industrial and Applied Mathematics (ICIAM) - 2019, July 15 - 19, 2019, Valencia, **Spain**.
7. J V Ramana Reddy, S Sundar, D Srikanth. "Mathematical Modelling of Drug Delivery to the Targeted Organs through Bio-Absorbable Nanoparticles", Presented in World Congress in Computational Mechanics (WCCM) - 2018, July 22 - 27, 2018, New York, **USA**.
6. J V Ramana Reddy, S Sundar. "Modelling and Simulation of Rheological Complex Fluid", Presented at In-house symposium - 2018, October 6 - 7, 2018, Department of Mathematics, **IIT Madras, India**.
5. J V Ramana Reddy and D Srikanth. "Two dimensional blood flow with effects of stratification through composite stenotic tapered flexible artery - A mathematical model", Presented in International Conference on Mathematics (ICM) - 2015, November 26 - 28, 2015, University of Kerala, Thiruvananthapuram, **India**.
4. J V Ramana Reddy and D Srikanth. "Analysis of pulsatile blood flow through a flexible artery - Effects of tapering angle, catheter, and velocity slip", Presented in Indian Society of Theoretical and Applied Mechanics **(ISTAM) - 2014**, December 17 - 20 , 2014, Alliance University, Bangalore, **India.**
3. J V Ramana Reddy, D Srikanth and SVSSNVG Krishna Murthy. "Numerical investigation of pulsatile blood flow through a flexible artery - Effects of catheter, tapering angle and velocity slip", Presented in **International Congress of Mathematicians (ICM) - 2014**, August 13 - 21, 2014, **Seoul, Korea**.
2. J. V. Ramana Reddy, D. Srikanth and SVSSNVG Krishna Murthy. "Shear stress distribution at the wall of $\omega-$shape stenotic tapered artery in the presence of catheter and velocity slip - Effects of polar fluid", Presented in the 2nd International Conference on Applications of Fluid Dynamics (ICAFD) - 2014, July 21 - 23, 2014, Sri Venkateshwara University, Tirupati, **India.**
1. J V R Reddy, D. Srikanth and Krishna Murthy. "Resistance to the flow of micropolar fluid through unsymmetric stenosed artery - Effects of catheter and slip velocity", Presented in Indian Society of Theoretical and Applied Mechanics **(ISTAM) - 2012**, December 17 - 20, 2012, Defence Institute of Advanced Technology, **India.**

Invited Talks and other Research Presentations

10. Invited talk in "International Workshop on Mathematical Computations Using Software's", at Department of Mathematics, **Akal University**, Punjab, **India**, April 26-28, 2023.
9. Invited talk on "Introduction to Medical Data and Topological Data Analysis - Connection with an Example", at D B F Dayanand College of Arts and Science, **Solapur University**, **India**, March 26, 2023.
8. Invited talk on "Investigating the Fontan babies' mortality by the CFD simulation and shape analysis", at a two-day National (Online) Workshop on "Mathematical Modelling of Real World Applications (MMRWA-2023)" organized by the Department of Mathematics, School of Technology, **Pandit Deendayal Energy University**, **India**, March 24-25, 2023.
7. Invited talk on "Classification and prediction of the Aortic Dissection patient's risk", at 5-Day International workshop on Applicable Mathematics for Science and Engineering – Recent Advances (AMSE 2023) organized by Department of Mathematics, **VIT-AP University**, Amaravathi, Andhra Pradesh, **India**, February 16 – 20, 2023.

6. Invited talk on "A mathematical framework for determining the risk of Fontan surgery and Aortic Dissection", at Engineering Mechanics Unit Colloquium **JNCASR**, Bangalore, **India**, February 1, 2023.
5. Invited talk on "Fontan Hemodynamics Patient-Specific Phase Contrast Cardiac Magnetic Resonance Studies: A Computational Fluid Dynamics", at School of Advanced Science, **VIT-AP University**, Amaravathi, Andhra Pradesh **India**, January 22, 2022.
4. J V Ramana Reddy, Hojin Ha. "Fontan hemodynamics from 29 patient-specific cardiac magnetic resonance studies: A computational fluid dynamics", Presentation in MathGroup Seminar, Apr 23, 2021, Tohoku University, **Japan**.
3. Presentation on "Mathematical Modelling of Blood Flow Through Unhealthy Arteries", at **TIFR Centre for Applicable Mathematics**, Bangalore, **India**, August 17, 2016.
2. Invited talk on "LaTeX programming", at Navodaya Institute of Technology, Karnataka, **India**, June 6, 2016.
1. Invited talk on "Applications of Mathematics in Biology", at D B F Dayanand College of Arts and Science, Solapur University, **India**, December 23, 2015.

Honors and Awards

- **WPI-AIMR Fusion Research - 2024** project on *Operando Electrochemical-Atomic Force Microscopy complemented* with D Siraprapha, Y Takeharu
- **WPI-AIMR Fusion Research - 2023** project on *Quantum noise spectroscopy of fluctuations in quantum matter* with L Jana, L Wang, H Morishita, S Mizukami
- **WPI-AIMR Fusion Research - 2023** project on *Strain-engineering of two-dimensional materials at the atomic scale* with H Oka, L Jana
- **Young Scientist Award - 2022** at International Academic Awards from SCIFAX, Asia-Pacific
- Received **financial support** from the International Council for Industrial and Applied Mathematics (ICIAM) to present research work at the ICIAM Conference, Valencia, Spain, 2019.
- Received **financial support** from the Science and Engineering Research Board of India (SERB) to present research at the World Congress of Computational Mechanics (WCCM) 2018.
- **Researcher of the year(PhD) - 2015 award** from Defence Institute of Advanced Technology, Ministry of Defence, India.
- Recipient of the Defence Institute of Advanced Technology institutional fellowship (India's CSIR-UGC norms) during PhD, from August 2011 to August 2016
- Qualified Graduate Aptitude Test in Engineering(GATE) - 2011 examination in Mathematics
- **First rank** in Pondicherry University Post-Graduation Entrance Examination in Mathematics.
- **Scholarship of Excellence - 2010 award** from Basic Research Education & Development Society, India
- Received **Certificate of Merit** for getting highest marks in Mathematics in 1^{st} year B.Sc in 2006 at Silver Jubilee Government College, Kurnool, Andhra Pradesh.

- Life Member of Indian Society for Theoretical and Applied Mechanics (ISTAM)
- Member of International Association of Engineers (IAEng)
- Member of Topological data analysis community, AIMR, Japan.

- A **team member** created ResearchersJob(), an online academic job search platform for researchers and academicians.