Dr. VISHNUKUMAR S.

Associate Professor

Department of Computer Applications

Cochin University of Science and Technology

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Educational qualifications

- **Doctor of Philosophy (Ph. D.)** in Computer Science & Engineering from University of Kerala (2017).

  Thesis Title: An Investigation into Image Super-Resolution Algorithms"
  Supervisor: Prof. Dr. M. Wilscy, Department of Computer Science, University of Kerala.
  Centre: Department of Computer Sciences, University of Kerala, Thiruvananthapuram.

- **Master of Technology (M. Tech.)** in Computer Science (with specialization in Digital Image Computing) from University of Kerala (2008).

  Dissertation Title: "Adaptive Local Image Registration"
  Supervisor: Prof. Dr. M. Wilscy, Department of Computer Science, University of Kerala.
  Institute: Department of Computer Science, University of Kerala, Thiruvananthapuram.

- **Bachelor of Technology (B. Tech.)** in Information Technology from University of Kerala (2005).

  Institute: *University College of Engineering, Kariavattom, Thiruvananthapuram.*

- **Pre-Degree (Science Group)** from University of Kerala (2001).

  Institute: *Mar Ivanios College, Nalanchira, Thiruvananthapuram.*

- **SSLC** (1999)

  Institute: *St. Joseph's Higher Secondary School, Thiruvananthapuram.*

- **GATE** qualified in Computer Science and Engineering (2006 & 2012).

Experience

- **Associate Professor**, Department of Computer Applications, Cochin University of Science and Technology, Kochi, Kerala, India. (06.11.2020 to till the date)
- **Head of Department**, Department of Computer Engineering, Govt. Polytechnic College, Nedumkandam, Idukki, Kerala, India. (28.02.2019 to 05.11.2020)
- **Assistant Professor**, Department of Computer Science and Engineering, Mar Baselios College of Engineering and Technology, Thiruvananthapuram, Kerala, India. (01.07.2010 to 27.02.2019)
- **Lecturer**, Department of Computer Science and Engineering, Mar Baselios College of Engineering and Technology, Thiruvananthapuram, Kerala, India. (01.07.2009 to 30.06.2010)
- **Lecturer**, Department of Computer Science, Rajagiri College of Social Sciences, Kochi, Kerala, India. (04.08.2008 to 30.06.2009)

Research Publications

Journals

1. Jishnu, C. R., and **Vishnukumar S**. "Multi exposure image fusion based on exposure correction and input refinement using limited low dynamic range images." **Journal of Visual Communication and Image Representation**, Vol. 95, September 2023. **(SCI Impact Factor: 2.6).**
2. Koshy George and **Vishnukumar S**. "A Hybrid Approach to Generate Visually Seamless Aerial Mosaicks from Unmanned Aerial Vehicles." **Journal of Intelligent and Fuzzy Systems, IOS Press**, Vol. 36, No. 3, pp. 2075-2083, March 2019. **(SCI Impact Factor: 2).**
3. **Vishnukumar S** and M. Wilscy. "Single image super-resolution based on compressive sensing and improved TV minimization sparse recovery." **Optics Communications, Elsevier,** Vol.404, pp.80-93, December 2017 **(SCI Impact Factor: 2.4).**
4. **Vishnukumar S**., Madhu S. Nair and M. Wilscy, "Edge Preserving Single Image Super-resolution with Improved Visual Quality", **Signal Processing, Elsevier**, Vol.105, pp.283-297, December 2014. **(SCI Impact Factor: 4.4).**
5. Koshy George and **Vishnukumar S,** "UAV: The Current Trend in the Aerial Imaging" CSI Communications, Vol. 40, No. 9, pp. 21-22, December 2016.
6. **Vishnukumar S**. and M. Wilscy, "Adaptive Local Image Registration: Analysis on Filter Size", International Journal on Computer Science and Engineering (IJCSE), pp.1220-1225, Vol.4, No.06, June 2012.

Conferences

1. Jishnu, C. R., and **Vishnukumar S**. "An Effective Multi-exposure Fusion Approach Using Exposure Correction and Recursive Filter." In Inventive Systems and Control: Proceedings of ICISC 2023, pp. 625-637. Singapore: Springer Nature Singapore, 2023.

2. Greeshma, K., and Vishnukumar S. "Identification of Tuberculosis Bacilli from Bright Field Microscopic Sputum Smear Images using U-Net and Random Forest Classification Algorithm." **IEEE** International Conference on Advances in Intelligent Computing and Applications (AICAPS), pp. 1-4, IEEE, February 2023.

3. Resmi M R and **Vishnukumar S**, "A Novel Segmentation Based Copy-Move Forgery Detection in Digital Images", **IEEE** International Conference on Networks and Advances in Computational Technologies, IEEE, July 2017.

4. Nayana Mohan and **Vishnukumar S**. "Detection and Localization of Coronary Artery Stenotic Segments using Image Processing." **IEEE** International Conference on Emerging Technological Trends", (ICETT), IEEE, October 2016.

5. **Vishnukumar S**. and M. Wilscy. "Super-resolution for remote sensing images using content adaptive detail enhanced self examples." **IEEE** International Conference on Circuit, Power and Computing Technologies (ICCPCT), IEEE, pp. 1-5, March 2016.

6. Joseph, Princymol, and **Vishnukumar S**. "A study on steganographic techniques." **IEEE** Global Conference on Communication Technologies (GCCT), IEEE, pp. 206-210, April 2015.

7. **Vishnukumar S.,** "Image Super-Resolution and Applications", International Colloquium on Information Security in e-Governance, November 2015.

8. **Vishnukumar S**. and M. Wilscy, "A Comparative study on Adaptive Local Image Registration Methods", Proceedings for the International Conference on Signal Processing - ICSPS 2009, **IEEE** Computer Society Press, Singapore, pp.140-145, May 2009.

9. **Vishnukumar S**. and M. Wilscy, "Adaptive Local Image Registration for Colour Images", Proceedings for the National Conference on Computational Science and Engineering - NCCSE-2009, pp.42-49, February 2009, ISBN: 978-81-907044-0-3.

Reviewer:

Journals

- Digital Signal Processing, Elsevier.
- Biomedicine & Pharmacotherapy, Elsevier.
- Optics Communications, Elsevier.
- Optics and Laser Technology, Elsevier.
- Computers and Electrical Engineering, Elsevier.

- KSII Transactions on Internet and Information Systems.
- Journal of Testing and Evaluation.

Conferences

- 2024 IEEE International Conference on Recent Advances in Intelligent Computational Systems (RAICS) May 16 - 18 May 2024
- 2024 International Conference on Advanced Computing, Communication and Electrical Systems (ICACCES 2024) 22 - February 2024.
- 2023 International Conference on Advances in Intelligent Computing and Applications (AICAPS 2023): 1-3 February. 2023
- 2022 IEEE International Conference on Signal Processing, Informatics, Communication And Energy Systems (IEEE SPICES 2022) 10 – 12 March, 2022
- 2020 International Conference on Data Science and Engineering (ICDSE2020), 03-05 December 2020, Kochi, India.
- 2019 International Conference on Communication Systems and Networks (ComNet2019), 12-13 December 2019, Thiruvananthapuram, India.
- 2019 International Conference on Networks & Advances in Computational Technologies (NetACT2019), 23-25 July 2019, Thirvananthapuram, India.
- 2018 International Conference on Sensor Networks and Signal Processing (SNSP 2018) October 28-31, 2018, Xi`an University of Science and Technology, China
- 2018 IEEE International Conference on Control, Communication and Computing 5th- 7th July2018, Thiruvananthapuram, India.
- 2018 International Conference on Network Engineering and Information Security(NEIS2018), April 20th - 22nd, 2018, Wuhan, China Wuhan, China.
- 2017 IEEE International Conference on Networks & Advances in Computational Technologies (NetACT2017), 20-22 July 2017, Thirvananthapuram, India.
- 2011 4th IEEE International Conference on Computer Science and Information Technology (ICCSIT 2011), 10-12 June 2011, Chengudu, China.

Funded Project

- Name of the project: Computer-aided intervention and diagnostics of early stage autism spectrum disorder in children using medical images.
    - Project Category: Engineering and Technology Programme
    - Sponsoring Agency: Kerala State Council for Science Technology and Environment (KSCSTE)
    - File No.: File No. Council (P) Order No. 291/2022/KSCSTE dated 07.11.2022

- - Sanctioned Amount: Rs. 12,25,800/-
  - Duration: 3 years (2023-2025)
  - Status: Ongoing

- Name of the project: Detection and Analysis of Tuberculosis Bacilli in Sputum Smear Images using Machine Learning Techniques
  - Project Category: Seed Money for New Research Initiatives
  - Sponsoring Agency: Cochin University of Science and Technology
  - File No.: File No. CUSAT/PL(UGC).1/SMNRI/2021
  - Sanctioned Amount: Rs. 250000/-
  - Duration: 2 years (2021-2023)
  - Status: Ongoing

- Name of the project: Developing Image Super-resolution Techniques
  - Project Category: Minor Research Project
  - Sponsoring Agency: Computer Society of India
  - File No.: File No.1-15/2015-013
  - Sanctioned Amount: Rs. 15000/-
  - Duration: 1 years (2015-2016)
  - Status: Completed

PhD Thesis Supervision

- Mr. Jishnu C R, Title: "Multi-Exposure Image Fusion Techniques", Faculty of Cochin University of Science and Technology.
- Ms. Nissa A K, Title: "Image Dehazing Techniques", Faculty of Cochin University of Science and Technology.
- Ms. Reena Mary , Title: "Under Water Image Enhancement Techniques", Faculty of Cochin University of Science and Technology.
- Ms. Greeshma K, Title: "Tuberculosis Bacilli in Sputum Smear Images using Machine Learning Techniques", Faculty of Cochin University of Science and Technology.

Resource Person (Expert Lectures, Training & Talk):

- **"Progressive Techniques for MRI and Microscopic Image Analysis and Interpretations"** SERB sponsored Seminar on "Deep Learning Techniques and Tools for Medical Applications" organized by Baselios Mathews II College of Engineering, Sasthamcotta, Kollam from 03 – 04 October 2024.

- **"Introduction to Digital Image Processing"** Higher Secondary School Teachers Transformation Programme, organized Directorate of General Education in association with Collegiate Education, Govt. of Kerala at Department of Computer Applications, Cochin University of Science and Technoly, from 16-25 February 2024

- Expert Talk on **"The Relevance of Professional Bodies in Engineering Educational Institutions"** at Carmel College of Engineering and Technology, Alapuzha on 23rd August 2023.

- **"Deep Learning and Computer Vision, Convolutional Image Processing, Architectures and Packages for Deep Learning & Deep Generative Models"** at Faculty Training programme on Recent Advancements in Image Processing and Computer Vision – 2021, organized by Department of Computer Science and Engineering, LBS Institute of Technology for Women, Thiruvananthapuram from 17th to 21st May 2021.

- **"Basics of Artificial Neural Networks"** at Workshop on "Introduction to Machine Learning Techniques" Organized by Department of Computer Applications Cochin University of Science and Technology, Kochi from 22nd to 26th March 2021.

- **"Overview of Deep Learning Architectures – CNN, Transfer Learning"** at AICTE Sponsored STTP on High Performance Computing and Deep Learning for Image, TextAnalysis, organized by Department of Computer Science and Engineering, Mar Baselios College of Engineering and Technology, Thiruvananthapuram from 22nd to 27th February 2021.

- **"Deep Learning and Super-Resolution"** at Second National Seminar on "Machine Intelligence", organized by Department of Computer Science, University of Kerala, Thiruvananthapuram from 22nd to 24th January 2020.

- **"Convolutional Neural Network"** at KTU Sponsored FDP on "Computer Vision and Machine Learning", organized by Department of Computer Science and Information Technology, College of Engineering Perumon, Kollam, from 24th to 26th July 2019.

- **"Convolutional Neural Network"** at National Workshop on Advanced Deep Learning, organized by Department of Computer Science and Engineering, Mar Baselios College of Engineering and Technology, Thiruvananthapuram from 20th to 22nd May 2019.

- Expert Talk on **"The Relevance of Professional Bodies in Engineering Educational Institutions"** at Musaliar College of Engineering and Technology, Pathanamthitta on 17th April 2019.

- **"Convolutional Neural Network" at** STTP on "Deep Learning and IoT Applications using MATLAB" organized by Department of Electronics and Communication Engineering, Mar Baselios College of Engineering and Technology, Thiruvananthapuram from 21st to 25th January 2019.

- **"Introduction to AI and CNN"** at National Workshop on Deep Learning at Thiruvananthapuram organized by Computer Society of India, Trivandrum Chapter from 3rd to 4th December 2018.

- **"Introduction to AI and CNN"** at Workshop on Artificial Intelligence and Deep Learning, organized by ISTE chapter at Mar Baselios College of Engineering and Technology, Thiruvananthapuram from 10th to 11th November 2018.

- **"Introduction to AI and CNN"** at FDP on "Basics of Artificial Intelligence and Machine Learning" at Mar Baselios College of Engineering and Technology, Thiruvananthapuram from 12th to 13th July 2018.
- Expert Lecture on **"Advanced Computer Science"** at Govt. Sanskrit College, Tripunithura on 6th July 2018.
- **"C Programming & Computer Science Techniques"** at National Workshop on The Basics of Computer Science organized by Govt. Sanskrit College, Tripunithura, with the financial assistance from the Directorate of Collegiate Education from 23rd to 29th October 2017.
- **"Inheritance"** Summer Training Programme on Object Oriented Programming in C++ organized by Computer Society of India from 12th to 16th July 2016.
- **"Web Search & procedures"** at Workshop on IT Oriented Personality Development organized by the Centre for Vedanta Studies, University of Kerala from 23rd to 27th March 2015.
- **"Online Services"** at Training Programme on e-Governance for Senior Citizens organized by Computer Society of India during March 2012.

Academic Responsibilities:

- Member, Academic Committee for UG Programmes - Computer Science, Sreenarayanaguru Open University, Kollam.
- Member, Board of Studies - Computer Science, Fatima Mata National College, Kollam.
- Member, Board of Studies - Computer Science and Engineering, Mar Baselios College of Engineering and Technology, Thiruvananthapuram.
- Member, Board of Studies - Computer Applications, Cochin University of Science and Technology, Kochi.

Volunteering Responsibilities:

- Chair, Web Coordination Team, IEEE Kerala Section
- Member, Conference Activity Board, IEEE Kerala Section
- Chair, IEEE Computer Society, Kerala Chapter (2022-2023)
- Vice Chair, IEEE Computer Society, Kerala Chapter (2020-2021)
- Executive Committee Member, Kerala State IT Mission, Department of Information Technology, Govt. of Kerala (2017-2018).
- Chairman (2017-2018), Vice Chairman (2016-2017), Secretary (2014-2016), Treasurer (2012-2014), Computer Society of India Trivandrum Chapter.

Committee Member

Technical Program Committee Chair

1. 2017 IEEE International Conference on Networks & Advances in Computational Technologies (NetACT2017), 20-22 July 2017, Thirvananthapuram, India.

International Scientific Committee Member

1. 2018 International Symposium on Power Electronics and Control Engineering (ISPECE 2018) December 28-30,2018 in Xi'an, China.

Technical Program Committee Member

1. 11th International Conference on Advances in Computing & Communications (ICACC 2024), 21-23 November 2024, Kochi, India.

2. IEEE International Conference on Smart Technologies for Sustainable Development Goals (ICSTSDG'24) from 29–31, August 2024, Chennai, India.

3. 3rd International conference on Networks & Advances in Computational Technologies (NetACT24) July 2024, Thiruvananthapuram, India.

4. National Conference on Deep Learning and Applications "Deep.Learn (2021)", 19-20 February 2021, Thiruvananthapuram, India.

5. 2019 International Conference on Networks & Advances in Computational Technologies (NetACT2019), 23-25 July 2019, Thirvananthapuram, India.

6. 2018 International Conference on Network Engineering and Information Security (NEIS2018), April 20th - 22nd, 2018, Wuhan, China Wuhan, China.

Organizing Committee Member

1. 2024 IEEE International Conference on Signal Processing, Informatics, Communication And Energy Systems (SPICES 2024) 20 – 22 September, 2024

2. 2024 IEEE International Conference on Recent Advances in Intelligent Computational Systems (RAICS 2024) May 16 - 18 May 2024

3. 2012 International Conference on Green Technologies (ICGT 2012) 18-20 December 2012, Thiruvananthapuram India.

4. National Conference on Applied Linear Algebra & Transform Techniques, 10-11 July 2012, Thiruvananthapuram India.

OutReach Committee Member

1. 5th International Conference on Recent Trends in Computing (ICRTC-18) December 27-28, 2018, Ghaziabad, Delhi.

Technical Session Chair

1. Chaired Technical Sessions at 2024 International Conference on Futuristic Technologies in Control Systems and Renewable Energy (ICFCR), 25-26 September 2024.

2. Chaired Technical Sessions at 2022 IEEE 19th India Council International Conference (INDICON). 24 – 26 November 2022.

3. Chaired a Technical Session at 2020 International Conference on Data Science and Engineering (ICDSE2020), 03-05 December 2020, Kochi, India.

4. Chaired a Technical Session at National Conference on Deep Learning and Applications "Deep.Learn (2021)", 19-20 February 2021, Thiruvananthapuram, India.

5. Chaired a Technical Session at 2019 Springer International Conference on Communication Systems and Networks (COMNET2019), 12-13 December 2019, Thiruvananthapuram, India.

6. Chaired a Technical Session at 2019 International Conference on Networks & Advances in Computational Technologies (NetACT2019), 23-25 July 2019, Thirvananthapuram, India.

7. Chaired a Technical Session at 2017 IEEE International Conference on Networks & Advances in Computational Technologies (NetACT2017), 20-22 July 2017, Thirvananthapuram, India.

Award Jury Member

- CSI-Nihilent National e-Governance Award 2019, 2018, 2017
- CSI-InApp International National Student Project Awards 2022, 2021, 2020, 2019, 2018, 2017, 2016, 2015, 2014 & 2013
- CSI-Valiant e- Governance Kerala Awards 2015.

Short term courses/Seminars & Conferences organized:

1. 2023 International Conference on Advances in Intelligent Computing and Applications (AICAPS 2023): 1-3 February. 2023

2. Five Day Workshop on Introduction to Machine Learning Techniques in CUSAT during 22nd to 26th March 2021.

3. National Workshop on Deep Learning in Thiruvananthapuram from 3rd to 4th December 2018.

4. National Workshop on 'Data Science: Sales Forecast to Cognitive Computing' in Thiruvananthapuram on 5th August 2017.

5. IEEE International Conference on Networks and Advances in Computational Technologies 2017, in Thiruvananthapuram during 20-22 July 2017.

6. National Workshop on 'Market Intelligence and Digital Marketing' in Kochi on 29th April 2017.

7. National Workshop on 'Advanced Internet of Things in Thiruvananthapuram during 7-8 October 2016.

8. National Workshop on' Google Apps Framework ' in Thiruvananthapuram on 27th August 2016

9. Summer Training Programme on 'Object Oriented Programming in C++ ' during 12-16 July 2016

10. National workshop on 'Recent Trends in Big Data Analytics' in Thiruvananthapuram on 27th February 2016.

11. Workshop on 'NS 3' in Thiruvananthapuram during 22-23 February 2016.

12. Seminar on Innovation & Entrepreneurship Development in Thiruvananthapuram on 6th February 2016.

13. 7th e-Governance Knowledge Sharing Summit in Thiruvananthapuram during 10-11 December 2015.

14. International Colloquium on 'Information Security in e-Governance' in Thiruvananthapuram on 25th November 2015.

15. Workshop on 'Python Programming' in Thiruvananthapuram during 24-25 July 2015.

16. National workshop on 'Digital Forensics – Foundation, Frontiers and Challenges' in Thiruvananthapuram on 15th July 2015

17. Workshop on 'Data Analytics uses R Language' in Thiruvananthapuram on 28th March 2015.

18. Workshop on 'Software Defined Networking' in Thiruvananthapuram on 14th February 2015

19. Workshop on 'Big Data Analytics' in Thiruvananthapuram on 25th October 2014.

20. Seminar on the topic 'Role of Cyber Forensics in Mitigation of Cyber Crimes' in Thiruvananthapuram on 17th July 2014.

21. Workshop on 'What Accelerated Web App Development MEAN' in Thiruvananthapuram on 12th July 2014.

22. Workshop on 'Information Security and Cyber laws in Thiruvananthapuram on 1st February 2014.

23. 2012 International Conference on Green Technologies in Thiruvananthapuram during 18-20 December 2012.

24. National Conference on Applied Linear Algebra & Transform Techniques in Thiruvananthapuram during 10-11 July 2012.

25. Seminar on Free/Open Source Software in Technical Education in Thiruvananthapuram on 9th November 2009.

Awards and Honours:

- Rashtrapatipuraskar Scout Award from the President of India
- Rajyapuraskar Scout Award from the Governor of Kerala

Membership in Professional Societies:

Life Membership

- The Institution of Engineers, India (IEI) (Membership No: M-1665949)
- Computer Society of India (CSI) (Membership No: I1104002)
- Indian Society for Technical Education (ISTE) (Membership No: LM 98215)
- Association of Computer, Electronics and Electrical Engineers (ACEEE) (Membership No: 7000355)
- International Association of Engineers (IAENG) (Membership No: 101958)

- International Association of Computer Science and Information Technology (IACSIT) (Membership No: 80332045)

Membership

- IEEE Senior Member (Membership No: 80552088)
- Trivandrum Management Association (TMA) (Membership No: LMOM-721)

Research Interests:

- Digital Image Processing
- Machine Learning & Deep Learning
- Soft Computing
- Computer Vision