Phaneendra Kumar Yalavarthy

Department of Computational and Data Sciences (CDS)
Division of Interdisciplinary Sciences
Indian Institute of Science (IISc), Bangalore - 560 012 KA, India.
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RESEARCH INTERESTS
Artificial Intelligence for Medical Imaging, Computational methods in Medical Imaging, Perfusion imaging, Medical Image Processing (reconstruction/analysis), Inverse problems in Imaging, Imaging in Digital Rock, Machine Learning for Corrosion Analysis, and Cyber-Physical Systems.

EDUCATION

Ph.D., Thayer School of Engineering, June 2004 – Sep 2007
A generalized least-squares minimization method for near infrared diffuse optical tomography
Advisor: Prof. B. W. Pogue.
Dartmouth College, Hanover, NH, USA.

M.Sc.(Engineering), Department of Instrumentation, Aug 2001 – Jan 2004
Diffuse optical tomographic reconstruction in low-scattering tissue: development of inversion algorithms based on Monte-Carlo simulation
Advisors: Prof. R. M. Vasu and Prof. P. C. Mathias
Indian Institute of Science, Bangalore, India.

M.Sc.(Physics), Department of Physics, June 1999 – March 2001
Precision measurements of energies and intensities of gamma transitions in the electron capture decay of ^{75}Se using large volume HPGe-detector
Advisor: Dr. M. Sainath
Sri Sathya Sai University, Prasanthi Nilayam, India.

B.Sc., Honors in Physics, June 1996 – March 1999
Sri Sathya Sai University, Prasanthi Nilayam, India.

POSITIONS

Chief Project Manager   **AI-CoE in Healthcare, IISc**
TANUH   **Bangalore, India**
July 2025 –

Establishing a not for profit Sec. 8 company for the AI-Centre of Excellence in Healthcare, funded by Ministry of Education, Govt. of India (https://www.tanuh.ai/)

Professor   **Indian Institute of Science**
Department of Computational & Data Sciences   **Bangalore, India**
Dec 2020 –

Convener, Medical Imaging Group (MIG)

Consulting Principal   **GE HealthCare**
Edison AI Advanced Technology Group (ATG)   **Bangalore, India**
July 2023 – June 2024

Development of Advanced X-ray Computed Tomography Reconstruction Algorithms (on sabbatical leave from IISc).

Chair   **Indian Institute of Science**
Office of Development & Alumni Affairs   **Bangalore, India**
Aug 2020 – June 2023

Leading the fund raising from non-governmental and other philanthropic sources, global engagement of alumni and maintaining relations for/with IISc.

Chair	**Indian Institute of Science**
Office of International Relations	**Bangalore, India**
	Nov 2018 – Feb 2021

Chair of international relations, promoting global cooperation in research and education across various leading universities, and recruiting international students.

Associate Professor	**Indian Institute of Science**
Department of Computational & Data Sciences	**Bangalore, India**
	Dec 2014 – Nov 2020

Convener, Medical Imaging Group (MIG)

IISc Coordinator	**Indian Institute of Science**
Prime Ministers Research Fellowship (PMRF)	**Bangalore, India**
scheme	
	Mar 2018 – Aug 2020

Coordinating Prime Ministers Research Fellowship (PMRF) selections, admissions, reviewing and monitoring the implementation of the scheme.

Chair	**Indian Institute of Science**
Department of Computational & Data Sciences	**Bangalore, India**
	Jan 2016 – Feb 2018

Department Chair for the newly established interdisciplinary engineering department of computational and data sciences (CDS).

Consulting Principal	**Samsung R&D Institute**
Helath & Medical Equipment (HME)	**Bangalore, India**
	Jan 2015 – Dec 2015

Mobile Health Applications, Post-Processing algorithms development for Magnetic Resonance Imaging (on sabbatical leave from IISc).

Assistant Professor (Tenured from May, 2013)	**Indian Institute of Science**
Supercomputer Education and Research Centre	**Bangalore, India**
	Dec 2008 – Nov 2014

Convenor, Medical Imaging Group (MIG)

Visiting Teaching Professor	**Sri Sathya Sai University**
Department of Physics	**Puttaparthy, India**
	June & July 2014

Medical Image processing, Nuclear Medicine Imaging, and Digital Image Processing.

Visiting Assistant Professor	**Dartmouth College**
Thayer School of Engineering	**Hanover, NH**
	June & July 2010

Multi-modal optical imaging, Image guided diffuse optical tomography, and Optical image reconstruction with spatial priors.

Post-doctoral research associate	**Washington University School of**
Department of Radiation Oncology	**Medicine, St. Louis, MO**
	Oct 2007 – Nov 2008

Four-dimensional computed tomography, four-dimensional positron emission tomography, lung motion modeling, and computational methods in radiation therapy.

US DoD Breast Cancer Predoctoral Fellow	**Dartmouth College**
Thayer School of Engineering	**Hanover, NH**
	Feb 2006 – Sep 2007

Three-dimensional near infrared imaging of pathophysiological changes within the breast: Optimizing and developing three-dimensional near infrared image reconstruction techniques.

Teaching Assistant **Dartmouth College**
Thayer School of Engineering **Hanover, NH**
Fall 2006

ENGS 91: Numerical Methods in Computation.

Teaching Assistant **Dartmouth College**
Thayer School of Engineering **Hanover, NH**
Winter 2006

ENGS 105: Computational Methods for Partial Differential Equations I.

Graduate Research Assistant **Dartmouth College**
Thayer School of Engineering **Hanover, NH**
June 2004 – Jan 2006

Critical computational aspects in diffuse optical tomographic imaging of breast.

Graduate Research Assistant **Indian Institute of Science**
Department of Instrumentation **Bangalore, India**
Aug 2001 – Jan 2004

Diffuse optical tomographic imaging of low-scattering tissue.

TEACHING
- DS 260: Medical Imaging (January-April, 2025).
- DS 261o: Artificial Intelligence for Medical Image Analysis (Online: January-April, 2025).
- DS 288: Numerical Methods (August-December, 2024).
- Executive program on Artificial Intelligence in Healthcare (August 2024 - December 2024).
- Executive program on Artificial Intelligence for Digital Health and Imaging (November 2022 - June 2023).
- DS 261o: Artificial Intelligence for Medical Image Analysis (Online: January-April, 2023).
- DS 261: Artificial Intelligence for Medical Image Analysis (August-December, 2022).
- Executive program on Digital Health and Imaging (January-October, 2022).
- DS 260: Medical Imaging (January-April, 2022).
- DS 288: Numerical Methods (August-December, 2021).
- DS 294: Data Analysis and Visualization (March-June, 2021).
- Executive program on Digital Health and Imaging (February-July, 2021).
- DS 200: Research Methods (October 2020-January 2021).
- Executive program on Digital Health and Imaging (August 2020-January 2021).
- DS 260: Medical Imaging (January-June, 2020).
- DS 288: Numerical Methods (August-December, 2019).
- UE 201: Introduction to Scientific Computing (August-December, 2019).
- DS 200: Research Methods (August-December, 2019).
- DS 294: Data Analysis and Visualization (January-April, 2019).
- DS 260: Medical Imaging (January-April, 2019).
- DS 211: Numerical Optimization (August-December, 2018).
- DS 200: Research Methods (January-April, 2018).
- DS 260: Medical Imaging (January-April, 2018).
- DS 294: Data Analysis and Visualization (January-April, 2017).
- DS 260: Medical Imaging (January-April, 2017).
- DS 288: Numerical Methods (August-December, 2016).
- UE 201: Introduction to Scientific Computing (January-April, 2016).

- SE 284: Numerical Linear Algebra (August-December, 2014).

- SE 288: Numerical Methods (August-December, 2014).

- MTOS 105*: Digital Image Processing (June-July, 2014).

- MTNM 103*: Nuclear Medicine and Allied Instrumentation (June-July, 2014)
  *at Sri Sathya Sai University, Puttaparthy.

- SE 360: Topics in Medical Imaging (January-April, 2014).

- SE 360: Topics in Medical Imaging (January-April, 2013).

- SE 284: Numerical Linear Algebra (August-December, 2012).

- SE 260: Medical Imaging (January-April, 2012).

- SE 288: Numerical Methods (August-December, 2011).

- SE 260: Medical Imaging (January-April, 2011).

- SE 284: Numerical Linear Algebra (August-December, 2010).

- SE 260: Medical Imaging (August-December, 2009).

- SE 289: Numerical Solutions of Differential Equations (January-April, 2009).

HONORS/AWARDS

- Academic Editor, PLOS Digital Health (2026 -)

- Member, Technical Expert Committee (TEC) on Biodesign and Biomedical Engineering, Department of Biotechnology (DBT), Govt. of India (2026 -)

- Member, Technical Program Committee, Biomedical Health Sciences, Anusandhan National Research Foundation (ANRF), Department of Science and Technology (DST), Govt. of India (2025 -)

- Indian Institute of Technology, Tirupati - External Senate Member (educationist of repute) (2024 -)

- Member, Technical Expert Committee, ASEAN-India Science and Technology Development Fund (AISTDF), Department of Science and Technology (DST), Govt. of India (2024 -)

- Member, Selection Committee, Thomas F. Deutsch Fellowship in Biomedical Optics, Harvard Medical School, USA (2022 -)

- Member, Expert Committee, Wellcome Discovery Awards, Wellcome Trust, UK (2020 -)

- Member, Technical Expert Committee (TEC) on Biomedical Engineering and Stem Cells, Department of Biotechnology (DBT), Govt. of India (2022 -)

- S. Ramachandran National Bioscience Award for the year 2020, Department of Biotechnology (Government of India).

- Associate Editor, IEEE Transactions on Medical Imaging (2017 -)

- Member, Area Review Panel (ARP) for Diagnostics, COVID-19 Research Consortium, Department of Biotechnology (DBT) and Biotechnology Industry Research Assistance Council (BIRAC), Govt. of India (2020 -)

- Member, Technical Evaluation Committee (TEC), Biotechnology Ignition Grant (BIG), Biotechnology Industry Research Assistance Council (BIRAC), Govt. of India (2020 -)

- Expert Member, Bovine Semen Sorting Technology (Animal Biotechnology) Panel, Department of Biotechnology (DBT), Govt. of India (2020 - 2021)

- Member, Technical Expert Committee (Review committee) on Biomedical Engineering and Biodesign: Medical Devices, Diagnostics and implants, Department of Biotechnology (DBT), Govt. of India (2018 - 2022)

- Member, Task force of Bioengineering (Strategy committee), Department of Biotechnology (DBT), Govt. of India (2017 - 2020)

- The National Academy of Sciences India (NASI) Young Scientist Award (2014).

- Department of Biotechnology (Government of India) Innovative Young Biotechnologist Award (2013).
- Indian National Academy of Engineering (INAE) Young Engineer Award (2013).
- Recipient of Department of Biotechnology (Government of India) - Rapid Grant for Young Investigators (2013).
- Co-author of the work chosen for Summa Cum Laude Merit Award in the Twentieth Annual International Society for Magnetic Resonance in Medicine (ISMRM) meeting (2012) [Top 10 posters of ISMRM Meeting-2012].
- Department of Atomic Energy (Government of India) Young Scientist Research Award (2010).
- United Kingdom Royal Academy of Engineering (RAE) research exchange award (2010).
- Apple Laureate Award (2009).
- US Department of Defense breast cancer predoctoral fellowship award (2006-2008).
- SPIE student travel award to attend National Institutes of Health (NIH) Optical imaging workshop (2006).
- Outstanding teaching assistant awards (for both ENGS 91 & ENGS 105), Thayer School of Engineering, Dartmouth College (Winter 2006 & Fall 2006).
- International Centre for Theoretical Physics (ICTP) travel award to attend winter college on bio-photonics (2003).
- Recipient of fellowship including contingency funds from the Ministry of Human Resources and Development (MHRD), Government of India, throughout M.Sc.(Engineering) program at Indian Institute of Science, Bangalore, India (2001-2004).
- Received fellowship for both B.Sc. and M.Sc. (Physics) programs at Sri Sathya Sai Institute of Higher Learning (1996-2001).
- Honors in Physics (major) in B.Sc. (1999).

POST-DOCS ADVISING	1. Dr. Raji S. Mathew, C. V. Raman Postdoctoral Fellow (2021 - 2023) Current Position: Assistant Professor, Indian Institute of Science Education and Research (IISER), Thiruvananthapuram. 2. Dr. Vaishnavi Ravi, (June 2024 -) 3. Dr. Shreya Srivastava (May 2025 -) 4. Dr. Saurabh Sharma (June 2025 -)

STUDENTS ADVISING

Ph.D. Students
1. Ravi Prasad K. J. (Aug 2009 - Mar 2013)
Thesis Title: Development of efficient computational methods for better estimation of optical properties in diffuse optical tomography.
Current Position: Associate Professor, National Institute of Technology, Goa.
2. Jaya Prakash (Nov 2012 - Apr 2014)
Thesis Title: Development of next generation image reconstruction algorithms for diffuse optical and photoacoustic tomography.
Microsoft Research India Ph.D. Fellowship Awardee; SPIE Optics and Photonics Education Scholarship Awardee for the year 2013; Sir Vithal N Chandavarkar Memorial Medal for best Ph.D. thesis-2016.
Current Position: Assistant Professor, Instrumentation and Applied Physics, Indian Institute of Science (IISc), Bangalore.
3. B. Calvin Shaw (Oct 2012 - Sep 2014)
Thesis Title: Development of Sparse Recovery based Optimized Diffuse Optical and Photoacoustic Image Reconstruction Methods.
SPIE Optics and Photonics Education Scholarship Awardee for the year 2014; Awarded Best Ph.D. thesis Citation by the Department 2016; Awarded Best M.Sc. (Engg.) thesis Citation by the Department - 2013.

Current Position: Acoustics Transducer Lead (AR/VR/Portal), Reality Labs, Meta (Facebook), California, USA.

4. Manish Bhatt (Aug 2013 - Aug 2016)
Thesis Title: Toward computationally efficient models for near-infrared and photoacoustic tomographic imaging.
Current Position: Assistant Professor, Electrical Engineering, IIT-Guwahati.

5. Yamuna N. Swamy (Jan 2010 - Dec 2016)
Thesis Title: Studies on Kernel Based Edge Detection and Hyper Parameter Selection in Image Restoration and Diffuse Optical Image Reconstruction.
Current Position: Post-doctoral Research Fellow, ICTS-TIFR, Bangalore.

6. Sreedevi Gutta (Jan 2015 - Jan 2018)
Thesis Title: Improving photoacoustic imaging with model compensating and deep learning methods.
TCS Ph.D. Fellowship Awardee; Awarded Best Ph.D. thesis Citation by the Department 2018.
Current Position: Assistant Professor, Computer Science, California State University, USA.

7. Navchetan Awasthi (Aug 2016 - Dec 2018)
Thesis Title: Vector Extrapolation and Guided Filtering Methods for Improving Photoacoustic and Microscopic Images.
Sir Vithal N. Chandavarkar Memorial Medal for best Ph.D. thesis - 2020.
Current Position: Assistant Professor, School of AI & Data Science, IIT-Jodhpur. 8. Aditya Rastogi (Aug 2018 - Feb 2022)
Thesis Title: Development of Novel Deep Learning Methods for Fast-MRI: Anatomical Image Reconstruction to Quantitative Imaging.
Current Position: Post-Doctoral Researcher, Department of Neuroradiology, Universittsklinikum Bonn, Germany.

9. P. Naveen (Aug 2019 - June 2023)
Thesis Title: Development of Novel Deep Learning Models with Improved Generalizability for Medical Image Analysis.
Sir Vithal N. Chandavarkar Memorial Medal for best Ph.D. thesis - 2025.
Current Position: Senior AI Scientist, GE Healthcare, Bangalore.

10. Hariharan Ravishankar (Oct 2020 - June 2025)
Thesis Title: Unsupervised test-time adaptation for patient-specific deep learning models in medical imaging.
Current Position: Chief AI Scientist, Intangles Lab Pvt Ltd, Bangalore.

11. Venkatesh Vaddadi (Jan 2020 - Jan 2025)
Thesis Title: Development of novel deep learning models for quantitative medical image analysis.
Current Position: Research Staff Member, TANUH, IISc, Bangalore.

12. Sejal Maisheri (Aug 2024 -)
13. Rohit Pardasani (Aug 2024 -)
14. Saisree Nathala (Aug 2024 -)
15. Lakshmi Priyaa C A (Aug 2025 -)

Master Students
1. A. Kalyan Ram, M.Sc. (Engg.) Student (Aug 2011 - May 2013)
2. Jaya Prakash, M.Sc. (Engg.) Student (Aug 2011 - Oct 2012)
3. B. Calvin Shaw, M.Sc. (Engg.) Student (Aug 2011 - Sep 2012)
4. Tanmoy Mahajan, M.Tech Student (Aug 2014- Jun 2016)
5. Navchetan Awasthi, M.Tech Student (Aug 2014- Jun 2016)
6. Dween R. Sanny, M.Tech. (Research) Student (Aug 2016 - Aug 2018)
7. Sumit Sharma, M.Tech. Student (Aug 2016 - Jun 2018)
8. Biplab Kumar Pradhan, M.Tech. Student (Aug 2016 - Jun 2018)
9. Rohit Pardasani, M.Tech. Student (Aug 2017 - Jun 2019)
10. Megha Goel, M.Tech. Student (Aug 2017 - Jun 2019)
11. Ocima Kamboj, M.Tech. Student (Aug 2018 - Jul 2020)
11. Somil Jain, M.Tech. Student (Aug 2018 - Jul 2020)
12. Gaurav Oberoi, M.Tech. Student (Aug 2018 - Jul 2020)

13. Arindam Dutta, M.Tech. (Research) Student (Aug 2019 - Aug 2021)
14. Utkarsh Gupta, M.Tech. (Research) Student (Aug 2019 - July 2021)
[Subramanian Rajalakshmi Medal for best M.Tech. (Research) thesis - 2022]
15. Rahul John Roy, M.Tech. Student (Aug 2019 - July 2021)
16. Karan Harkishan Jeswani, M.Tech. Student (Aug 2019 - July 2021)
17. Avishek Shaw, M.Tech. Student (Aug 2019 - July 2021)
18. Rahul Wankhede, M.Tech. (Research) Student (Aug 2019 - April 2022)
19. Rahul Dev, M.Tech. Student (Oct 2020 - June 2022)
20. Karan R. Gujarati, M.Tech. Student (Aug 2021 - June 2023)
21. Arijit K. Mishra, M.Tech. Student (Aug 2021 - June 2023)
22. Varun Kaushik, M.Tech. Student (Aug 2021 - June 2023)
23. Bojja Sai Kiran, M.Tech. Student (Aug 2023 - June 2025)
24. Gone Shiva Chandhra, M.Tech. Student (Aug 2023 - June 2025)
25. Sudhanshu Pandey, M.Tech. Student (Aug 2023 - June 2025)
26. Nidhi Sharma, M.Tech. Student (Aug 2024 -)
27. Bhavana Mittapalli, M.Tech. Student (Aug 2024 -)
28. Deekasha Chutani, M.Tech. Student (Aug 2024 -)
29. Lavish Singh, M.Tech. Student (Aug 2025 -)
30. Kavya Duvvuri, M.Tech. Student (Aug 2025 -)
31. Anumala Sadhan, M.Tech. Student (Aug 2025 -)
32. Botta Lokesh Appa Rao, M.Tech. Student (Aug 2025 -)
33. V. V. S. Vignesh, M.Tech. Student (Aug 2025 -)

PATENTS

1. *Devices and methods for combined optical and magnetic resonance imaging* (United States Patent No: 8886284B2); Inventors: Pogue, B. W. and Carpenter, C. M. and Davis, S. C. and Paulsen, K. D. and **Yalavarthy, P. K.** and Dehghani, H.

2. *Methods for perfusion quantification based on oscillatory limited QR deconvolution and analytical spectral filtering* (Indian Patent No: 403270); Inventors: **Yalavarthy, P. K.** and Reddy, K. V. and Lee, J.

3. *Method and system for stereo-visual localization of object* (United States Patent No: 11647949B2); Inventors: Venkatesan, S. M., **Yalavarthy, P. K.** and Annamalai, T.

4. *Visual protocol for needle Insertion for aiding in intravenous procedures with a mobile stereo camera* (Indian Patent Application No: 201741020003); Inventors: Venkatesan, S. M. and **Yalavarthy, P. K.**

JOURNAL PUBLICATIONS

87. N. Paluru, M. Arora, and **P. K. Yalavarthy**, "Rolling Convolution Filters for Lightweight Neural Networks in Medical Image Analysis," Journal of Medical Imaging 2026 (in press).

86. S. Kethavath, Vasundhara, and **P. K. Yalavarthy**, "Comparative Analysis of Loss Functions for Uncertainty Quantification in Medical Image Segmentation," Biomedical Physics & Engineering Express **12**, 015033 (2026)

85. V. Vadaddi, R. S. Mathew, and **P. K. Yalavarthy**, "ISDU-QSMNet: Iteration Specific Denoising with Unshared Weights for Improved QSM Reconstruction," NMR in Biomedicine **38**(11), e70152 (2025).

84. J. Jeffery, A. RajKumar, S. Pandey, L. Bathala, and **P. K. Yalavarthy**, "Inference time correction based on confidence and uncertainty for improved deep-learning model performance and explainability in medical image classification," Computerized Medical Imaging and Graphics (Special issue on Trustworthy Artificial Intelligence for Medical Imaging) **125**, 102630 (2025).

83. A. K. Ipadeola, M. H. Sliem, D. Abdeen, N. Laycock, A. RajKumar, **P. K. Yalavarthy**, and A. M. Abdullah, "Integrated Electrochemical and Machine Learning Framework for $SiO_2/CaCO_3$

Under-deposits Driven Welded X65 Carbon Steel Corrosion Mitigation in Sour Service Conditions," Petroleum Research 2025 (in press).

82. A. K. Ipadeola, M. H. Sliem, D. Abdeen, N. Laycock, A. RajKumar, **P. K. Yalavarthy**, and A. M. Abdullah, "Unmasking the Hidden Threat: Conductive Under-Deposits and Their Role in Preferential Weldment Corrosion of Carbon Steel under Sour Conditions," Langmuir **41**(35), 23632-23651 (2025).

81. E. M. Fayyad, A. K. Ipadeola, M. H. Sliem, D. Abdeen, N. Al-Qahtani, A. RajKumar, J. Jeffrey, **P. K. Yalavarthy**, and A. M. Abdullah, "Interfacial robustness of commercial amine-based inhibitors mitigates under-deposit corrosion of carbon steel in simulated sour conditions: A merged electrochemical and machine learning study," Emergent Materials 2025 (in press).

80. A. RajKumar, N. Paluru, R. S. Mathew, P. Shenai, D. Abdeen, N. Laycock, and **P. K. Yalavarthy**, "Unsupervised Machine Learning for Automated Corrosion Staging Using Optical Microscopy Images," npj Materials Degradation **9**, 83 (2025).

79. H. Ravishankar, N. Paluru, P. Sudhakar, and **P. K. Yalavarthy**, "Information Geometric Approaches for Patient-Specific Test-Time Adaptation of Deep Learning Models for Semantic Segmentation," IEEE Transactions on Medical Imaging **44**(6), 2553–2567 (2025).

78. N. Paluru, R. S. Mathew, and **P. K. Yalavarthy**, "DF-QSM: Data Fidelity based Hybrid Approach for Improved Quantitative Susceptibility Mapping of the Brain," NMR in Biomedicine **37**(9), e5163 (2024).

77. V. Venkatesh, R. S. Mathew, and **P. K. Yalavarthy**, "SpiNet-QSM: Model-based Deep Learning with Schatten pnorm Regularization for Improved Quantitative Susceptibility Mapping," Magnetic Resonance Materials in Physics, Biology and Medicine (Special Issue on The role of artificial intelligence in MRI/MRS acquisition and reconstruction) **37**(3), 411–427 (2024).

76. A. Rastogi and **P. K. Yalavarthy**, "Greybox: A hybrid algorithm for direct estimation of tracer kinetic parameters from undersampled DCE-MRI data," Medical Physics **51**(7), 4838–4858 (2024).

75. U. Gupta, V. Periyasamy, R. Hofmann, J. Prakash, and **P. K. Yalavarthy**, "Two-step morphology-based denoising and non local means smoothing improves micro-CT digital rock images," Geophysical Prospecting (Special Issue on Rock Physics Contribution to the Energy Transition Challenge) **72**(5), 2049–2063 (2024).

74. C. Sindhura, M. Al Fahim, **P. K. Yalavarthy**, and S. Gorthi, "Fully Automated Sinogram-based Deep Learning Model for Detection and Classification of Intracranial Hemorrhage," Medical Physics **51**(3), 1944–1956 (2024).

73. K. R. Gujarati, L. Bathala, V. Venkatesh, R. S. Mathew, and **P. K. Yalavarthy**, "Transformer-based Automated Segmentation of the Median Nerve in Ultrasound Videos of Wrist-to-Elbow Region," IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control **71**(1), 56–69 (2024).

72. R. S. Mathew, N. Paluru, and **P. K. Yalavarthy**, "Model-Resolution based Deconvolution for Improved Quantitative Susceptibility Mapping," NMR in Biomedicine **37**(2), e5055 (2024).

71. A. Rastogi, A. Dutta, and **P. K. Yalavarthy**, "VTDCE-Net: A Time Invariant Deep Neural Network for Direct Estimation of Pharmacokinetic Parameters from Undersampled DCE MRI Data," Medical Physics **50**(3), 1560–1572 (2023).

70. N. Paluru, H. Ravishankar, S. Hegde, and **P. K. Yalavarthy**, "Self Distillation for Improving the Generalizability of Retinal Disease Diagnosis using Optical Coherence Tomography

Images," IEEE Journal of Selected Topics in Quantum Electronics (Issue on biophotonics) **29**(4), 7200812 (2023).

69. U. Gupta, V. R. Ahuja, S. R. Rapole, N. Saxena, R. Hofmann, R. J. Day-Stirrat, J. Prakash, and **P. K. Yalavarthy**, "Siamese-SR: A Siamese Super-Resolution model for boosting resolution of Digital Rock images for improved petrophysical property estimation," IEEE Transactions on Image Processing **31**, 3479–3493 (2022).

68. N. Awasthi, A. Dayal, L. R. Cenkeramaddi, and **P. K. Yalavarthy**, "Mini-COVIDNet: Efficient Light Weight Deep Neural Network for Ultrasound based Point-of-Care Detection of COVID-19," IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control (**Coverpage article**) **68**(6), 2023–2037 (2021).

67. J. Prakash, U. Agarwal, and **P. K. Yalavarthy**, "Multi GPU parallelization of maximum likelihood expectation maximization method for digital rock tomography data," Scientific Reports **11**, 18356 (2021).

66. D. S. Breland, A. Dayal, A. Jha, **P. K. Yalavarthy**, O. J. Pandey, and L. R. Cenkeramaddi, "Robust Hand Gestures Recognition using a Deep CNN and Thermal Images," IEEE Sensors Journal **21**(23), 26602-26614 (2021).

65. J. Prakash, S. K. Kalva, M. Pramanik, and **P. K. Yalavarthy**, "Binary Photoacoustic Tomography for Improved Vasculature Imaging," Journal of Biomedical Optics **26**(8), 086004 (2021).

64*. S. Gupta, P. K. Rai, A. Kumar, **P. K. Yalavarthy**, and L. R. Cenkeramaddi, "Target Classification by mmWave FMCW Radars using Machine Learning on Range-Angle Images," IEEE Sensors Journal **21**(18), 19993-20001 (2021).

63. P. K. Rai, H. Idse, R. R. Yakkati, A. Kumar, M. Z. A. Khan, **P. K. Yalavarthy**, and L. R. Cenkeramaddi, "Localization and Activity Classification of Unmanned Aerial Vehicle using mmWave FMCW Radars," IEEE Sensors Journal **21**(14), 16043-16053 (2021).

62. A. Rastogi and **P. K. Yalavarthy**, "SpiNet: A Deep Neural Network for Schatten p-norm Regularized Medical Image Reconstruction," Medical Physics **8**(5), 2214–2229 (2021).

61. D. S. Breland, S. B. Skriubakken, A. Dayal, A. Jha, **P. K. Yalavarthy**, and L. R. Cenkeramaddi, "Deep Learning based Sign Language Digits Recognition from Thermal Images with Edge Computing System," IEEE Sensors Journal **21**(9), 10445–10453 (2021).

60. N. Paluru, H. B. Jenssen, T. Sakinis, L. R. Cenkeramaddi, J. Prakash, and **P. K. Yalavarthy**, "Anam-Net: Anamorphic Depth Embedding based Light-Weight CNN for Segmentation of Anomalies in COVID-19 Chest CT Images," IEEE Transactions on Neural Networks and Learning Systems (Fast Track: COVID-19 Focused Papers) **32**(3), 932–946 (2021).

59. N. Awasthi, S. K. Kalva, M. Pramanik, and **P. K. Yalavarthy**, "Dimensionality Reduced Plug and Play Priors for Improving Photoacoustic Tomographic Imaging with Limited Noisy Data," Biomedical Optics Express (Feature issue of Translational Photoacoustic Imaging for Disease Diagnosis, Monitoring, and Surgical Guidance) **12**(3), 1320–1338 (2021).

58. A. Dayal, N. Paluru, L. R. Cenkeramaddi, J. Soumya, and **P. K. Yalavarthy**, "Design and Implementation of Deep Learning Based Contactless Authentication System Using Hand Gestures" Electronics (Artificial Intelligence Circuits and Systems (AICAS) Section) **10**(2), 182 (2021).

57. **P. K. Yalavarthy**, S. K. Kalva, M. Pramanik, and J. Prakash, "Non-local means improves total-variation constrained photoacoustic image reconstruction," Journal of Biophotonics **14**(1),

e202000191 (2021).

56. N. A. Kande, R. Dakshane, A. Dukkipati, and **P. K. Yalavarthy**, "SiameseGAN: A Generative Model for Denoising of Spectral Domain Optical Coherence Tomography Images," IEEE Transactions on Medical Imaging **40**(1), 180–192 (2021).

55. N. Awasthi, G. Jain, S. K. Kalva, M. Pramanik, and **P. K. Yalavarthy**, "Deep Neural Network Based Sinogram Super-resolution and Bandwidth Enhancement for Limited-data Photoacoustic Tomography," IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control (Special issue on Deep learning in medical ultrasound) **67**(12), 2660–2673 (2020).

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1. **P. K. Yalavarthy**, *A generalized least-squares minimization method for near infrared diffuse optical tomography*, Ph.D. Thesis, Dartmouth College, Hanover, September 2007.
(Abstract: http://www.medphys.org/PhDAbstracts/yalavarthyphd.pdf)

2. **P. K. Yalavarthy**, *Diffuse optical tomographic reconstruction in low-scattering tissue: development of inversion algorithms based on Monte-Carlo simulation*, M.Sc.(Engg.) Thesis, Indian Institute of Science, Bangalore, India, January 2004.

3. **P. K. Yalavarthy**, *Precision measurements of energies and intensities of gamma transitions in the electron capture decay of ^{75}Se using large volume HPGe-detector*, M.Sc. dissertation, Sri Sathya Sai University, Prasanthi Nilayam, India, March 2001.

LETTERS

1. **P. K. Yalavarthy**, *Ultrasound imaging: a boon or bane?*, Current Science 88(7), 1019, April 10, 2005.

PROFESSIONAL ACTIVITIES	

PROFESSIONAL ACTIVITIES

- Senior Member, Optical Society of America (OSA) and Society of Photo-Optical Instrumentation Engineers (SPIE), 2019 -
- Member (2021 - 2022), Office of International Relations, Indian Institute of Science, Bangalore.
- Member (2020 -), Board of Studies (BoS), Department of Applied Mathematics, Defence Institute of Advanced Technology (DIAT), Pune.
- Member (2019 -), Rankings and Performance Committee, Indian Institute of Science, Bangalore.
- Chair (2018 - 2020), M.Tech. admissions committee, Indian Institute of Science, Bangalore.
- Department Curriculum Committee (DCC) Member (2018 -), Interdisciplinary Program on Mathematical Sciences (IMI), Indian Institute of Science, Bangalore.
- Senior Member, IEEE, 2017 -
- Central Admission Committee Member (2016 -), External Registration Programme (ERP), Indian Institute of Science, Bangalore.
- Member (2016 -), Board of Studies (BoS), Department of Mathematics and Computer Science, Sri Sathya Sai Institute of Higher Learning (SSIHL), Puttaparthy.
- Chair, The Fifth Electrical Sciences Symposium, Indian Institute of Science, Bangalore, February 20-21, 2014.
- Associate Editor, Medical Physics (Science journal of the American Association of Physicists in Medicine), 2012 - 2016.
- Faculty Associate (2009-), Indian Institute of Science Mathematics Initiative (IMI).
- Department Curriculum Committee (DCC) Member (2009-2012), Supercomputer Education and Research Centre, Indian Institute of Science, Bangalore.
- Coordinator (2008), Imaging interest journal club, Department of Radiation Oncology, Washington University School of Medicine.
- Dartmouth teaching certificate, Dartmouth center for the advancement of learning (2006).

RESEARCH SUPPORT

Ongoing:
28. Project Title: TANUH: AI-Centre of Excellence in Healthcare
Duration: July 2025 - Mar 2029
Funding agency: Ministry of Education, Govt. of India
Chief Project Manager (PI): Phaneendra K. Yalavarthy and Co-Chief Project Manager: Sriram Ganapathy
Total Cost: ∼\$38 Million

27. Project Title: Localized Corrosion Inhibition in Sour Media for Welded C-steel of the Oil and Gas Pipelines Duration: Apr 2024 - Mar 2027
Funding agency: Qatar National Research Fund (QNRF)
Principal Investigator: Phaneendra K. Yalavarthy
Total direct cost to IISc: ∼\$78650
Total funding available: ∼\$739167 (Qatar Partner: Qatar University, Doha)

Completed:
26. Project Title: Developing a Robust Deepfake Detection Toolkit for Medical Imaging
Duration: Feb 2025 - Sep 2025
Funding agency: Accenture Ventures
Principal Investigator: Phaneendra K. Yalavarthy
Total cost: ∼\$72000

25. Project Title: WIPRO GE-CDS Collaborative Laboratory of Artificial Intelligence in Medical Imaging & Healthcare
Duration: June 2020 - Mar 2024

Funding agency: WIPRO-GE HealthCare, Bangalore
Principal Investigator: Phaneendra K. Yalavarthy
Total Cost: ~$120000

24. Project Title: Smart Corrosion Control for Ultra-High Heat Flux Steam Generators
Duration: Apr 2020 - Dec 2023
Funding agency: Qatar National Research Fund (QNRF)
Principal Investigator: Phaneendra K. Yalavarthy
Total direct cost to IISc: ~$74100
Total funding available: ~$618000 (Qatar Partner: Qatar Shell Research & Technology Center)

23. Project Title: Development of Novel Deep Learning Methods for Fast and Accurate Segmentation of Neuroimages
Duration: March 2021 - Feb 2024
Funding agency: Department of Biotechnology (DBT), Govt. of India
Principal Investigator: Phaneendra K. Yalavarthy
Total Cost: ~$23500

22. Project Title: Indo-Norwegian collaboration in Autonomous Cyber-Physical Systems (IN-CAPS)
Duration: July 2019 - December 2023
Funding agency: The Research Council of Norway (NFR)
Principal Investigator: Phaneendra K. Yalavarthy
Total direct cost to IISc: ~$57000
Total funding available: ~$361000 (Norwegian Partner: University of Agder, Norway)

21. Project Title: Deep Learning for Improving Photoacoustic Imaging
Duration: Jan 2019 - June 2022
Funding agency: Department of Science and Technology (DST), Govt. of India
Principal Investigator: Phaneendra K. Yalavarthy
Total Cost: ~$33500

20. Project Title: Deep Learning Methods for Improving Low-Dose Computed Tomography Perfusion Imaging
Duration: Mar 2019 - Mar 2022
Funding agency: Science and Engineering Research Board (SERB), Govt. of India
Principal Investigator: Phaneendra K. Yalavarthy
Total Cost: ~$50000

19. Project Title: TCI-SITE Assessment
Duration: Jan 2021 - Dec 2021
Funding agency: Becton-Dickinson Technology, Bangalore
Principal Investigator: Phaneendra K. Yalavarthy
Total Cost: ~$25000

18. Project Title: Deep Learning-based Sparse CT Reconstruction from Missing View Sinogram
Duration: Mar 2021 - Sep 2021
Funding agency: GE HealthCare, Bangalore
Principal Investigator: Phaneendra K. Yalavarthy
Total Cost: ~$45000

17. Project Title: Advanced image reconstruction methods for micro-CT imaging in petrology
Duration: June 2020 - July 2021
Funding agency: Shell Technology Centre, Bangalore
Principal Investigator: Phaneendra K. Yalavarthy
Total Cost: ~$102000

16. Project Title: Deep Learning in Oral Cancer Screening Image Analysis
Duration: Mar 2019 - Mar 2021
Funding agency: Biocon Foundation, Bangalore
Principal Investigator: Phaneendra K. Yalavarthy
Total Cost: ~$16600

15. Project Title: Few-shot transfer learning in medical imaging from sparse annotations
Duration: July 2020 - Dec 2020
Funding agency: GE HealthCare, Bangalore
Principal Investigator: Phaneendra K. Yalavarthy
Total Cost: ~$48600

14. Project Title: Edge aware micro-CT Reconstruction for Petrology
Duration: June 2019 - May 2020
Funding agency: Shell Technology Centre, Bangalore
Principal Investigator: Phaneendra K. Yalavarthy
Total Cost: ~$102000

13. Project Title: IFTAS-CDS Collaborative Laboratory of Data Science & Engineering
Duration: Apr 2019 - Mar 2020
Funding agency: IFTAS, Mumbai
Principal Investigator: Phaneendra K. Yalavarthy
Total Cost: ~$20000

12. Project Title: Intelligent Image Analysis Methods in Digital Rock
Duration: May 2018 - May 2020
Funding agency: Shell Technology Centre, Bangalore
Principal Investigator: Phaneendra K. Yalavarthy
Total Cost: ~$102000

11. Project Title: Deep Learning Based Optimisation of scan time in Positron Emission Tomography
Duration: April 2018 - Sep 2018
Funding agency: GE HealthCare, Bangalore
Principal Investigator: Phaneendra K. Yalavarthy
Total cost: ~$16600

10. Project Title: Training on Deep Learning for Medical Imaging
Duration: May 2019 - June 2019
Funding agency: GE HealthCare, Bangalore
Principal Investigator: Phaneendra K. Yalavarthy
Total cost: ~$16600

9. Project Title: Development of novel algorithms for quantitative photoacoustic imaging of blood and lymphatic vasculature
Duration: June 2014 - June 2017
Funding agency: Department of Biotechnology (DBT), Govt. of India
Principal Investigator: Phaneendra K. Yalavarthy
Total cost: ~$64000

8. Project Title: Towards real-time quantitative photoacoustic imaging of vascular abnormalities for near-future application in oncology (RTQ-PAI)
Duration: October 2015 - September 2016
Funding agency: European Research Council INDIGO Policy
Principal Investigator: Phaneendra K. Yalavarthy
Total direct cost to IISc: ~$14800
Total cost:~$36100 (European Partner: University of Bern and University of Twente)

7. Project Title: Accelerating Diffuse Optical Tomographic Image Reconstruction Using Graphics Processing Units and Multicore Architectures
Duration: June 2013 - June 2016
Funding agency: Department of Biotechnology (DBT), Govt. of India
Principal Investigator: Phaneendra K. Yalavarthy
Total cost: ∼$20000

6. Project Title: Development of Novel Computational Methods for Optical Molecular Tomographic Imaging
Duration: September 2013 - August 2016
Funding agency: Department of Biotechnology (DBT)
Principal Investigator: Phaneendra K. Yalavarthy
Total cost:∼$24000

5. Project Title: Development of Novel Algorithms for Three Dimensional Near Infrared Tomographic Imaging of Breast
Duration: January 2011 - March 2014
Funding agency: Department of Atomic Energy (DAE-BRNS)
Principal Investigator: Phaneendra K. Yalavarthy
Total cost: ∼$17000

4. Project Title: Spectroscopic analysis of near infrared images for vein detection
Duration: February, 2011 - March, 2011
Funding agency: Vphore Technologies, Bangalore
Principal Investigator: Phaneendra K. Yalavarthy
Total cost: ∼$6000

3. Project Title: Development of computationally efficient algorithms for three-dimensional near infrared tomographic imaging of breast.
Duration: August 2009 - July 2010
Funding agency: The Apple Research and Technology Support (ARTS) programme
Principal Investigator: Phaneendra K. Yalavarthy
Total cost: $30000

2. Project Title: Setting up medical imaging lab
Duration: Mar 2009 - Mar 2010
Funding agency: IISc, Bangalore (faculty start-up grant)
Principal Investigator: Phaneendra K. Yalavarthy
Total cost: ∼$35000

1. Project Title: Three-dimensional near infrared imaging of pathophysiological changes within the breast
Duration: Feb 2006 - Feb 2008
Funding agency: DoD Breast Cancer Pre-Doctoral Fellowship, USA
Principal Investigator: Phaneendra K. Yalavarthy
Total cost: $90000

PERSONAL
DETAILS

Date of Birth: August 21, 1979.
Marital Status: Married with two children.
Citizenship: Indian.