

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, Health informatics (m-Health), Medical Image Processing (reconstruction/analysis), Inverse problems in Imaging, Imaging in Digital Rock, 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

Consulting Principal **GE HealthCare**
Edison AI Advanced Technology Group (ATG) **Bangalore, India**
July 2023 –
Development of Advanced X-ray Computed Tomography Reconstruction Algorithms (on sabbatical leave from IISc).

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

Convener, Medical Imaging Group (MIG)

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
Department of Computational & Data Sciences

Indian Institute of Science
Bangalore, India
Dec 2014 – Nov 2020

Convener, Medical Imaging Group (MIG)

IISc Coordinator
Prime Ministers Research Fellowship (PMRF)
scheme

Indian Institute of Science
Bangalore, India

Mar 2018 – Aug 2020

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

Chair
Department of Computational & Data Sciences

Indian Institute of Science
Bangalore, India
Jan 2016 – Feb 2018

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

Consulting Principal
Health & Medical Equipment (HME)

Samsung R&D Institute
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)
Supercomputer Education and Research Centre

Indian Institute of Science
Bangalore, India
Dec 2008 – Nov 2014

Convener, Medical Imaging Group (MIG)

Visiting Teaching Professor
Department of Physics

Sri Sathya Sai University
Puttaparthi, India
June & July 2014

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

Visiting Assistant Professor
Thayer School of Engineering

Dartmouth College
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
Department of Radiation Oncology

Washington University School of
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
Thayer School of Engineering

Dartmouth College
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
Thayer School of Engineering

Dartmouth College
Hanover, NH
Fall 2006

ENGS 91: Numerical Methods in Computation.

Teaching Assistant
Thayer School of Engineering

Dartmouth College
Hanover, NH
Winter 2006

ENGS 105: Computational Methods for Partial Differential Equations I.

Graduate Research Assistant
Thayer School of Engineering

Dartmouth College
Hanover, NH
June 2004 – Jan 2006

Critical computational aspects in diffuse optical tomographic imaging of breast.

Graduate Research Assistant
Department of Instrumentation

Indian Institute of Science
Bangalore, India
Aug 2001 – Jan 2004

Diffuse optical tomographic imaging of low-scattering tissue.

TEACHING

- 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, Puttaparthi.
- 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

- Member, Technical Expert Committee, ASEAN-India Science and Technology Development Fund (AISTDF), Department of Science and Technology (DST), Govt. of India (2014 -)
- 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).

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, University of Amsterdam, Netherlands.

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 Research Fellow, Universittsklinikum Heidelberg (UKHD), Germany.

9. P. Naveen (Aug 2019 - June 2023)

Thesis Title: Development of Novel Deep Learning Models with Improved Generalizability for Medical Image Analysis.

Current Position: Senior AI Scientist, GE Healthcare, Bangalore.

10. Venkatesh Vaddadi (Jan 2020 -)

11. Hariharan Ravishankar (Oct 2020 -)

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. Biplob 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 -)
24. Gone Shiva Chandhra, M.Tech. Student (Aug 2023 -)
25. Sudhanshu Pandey, M.Tech. Student (Aug 2023 -)

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

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 2024 (in press)
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, 2024 (in press).

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* 2024 (in press).
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)* 2024 (in press).
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**, “VTDCNet: 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).
54. N. Awasthi, P. Katare, S. S. Gorthi, and **P. K. Yalavarthy**, “Guided filter based image enhancement for focal error compensation in low cost automated histopathology microscopic system,” *Journal of Biophotonics* **13**(11), e202000123 (2020).
53. A. Rastogi and **P. K. Yalavarthy**, “Comparison of iterative parametric and indirect deep learning-based reconstruction methods in highly undersampled DCE-MR Imaging of breast,” *Medical Physics* **47**(10), 4838–4861 (2020).
52. A. Kaushik, **P. K. Yalavarthy**, and R. K. Saha, “Convergent Born series improves accuracy of numerical solution of time independent photoacoustic wave equation,” *Journal of Modern Optics* **267**(9), 849–855 (2020).
51. D. R. Sanny, J. Prakash, S. K. Kalva, M. Pramanik, and **P. K. Yalavarthy**, “Fractional Regularization to Improve Photoacoustic Tomographic Image Reconstruction,” *IEEE Transactions on Medical Imaging* **38**(8), 1935–1947 (2019).
50. N. Awasthi, K. Ram Prabhakar, S. K. Kalva, M. Pramanik, R. V. Babu, and **P. K. Yalavarthy**, “PA-Fuse: A Deep Supervised Approach for Fusion of Photoacoustic Images with Distinct Reconstruction Characteristics,” *Biomedical Optics Express* **10**(5), 2227–2243 (2019).

49. S. Gutta, V. S. Kadimesetty, S. Ganapathy, and **P. K. Yalavarthy**, “Convolutional Neural Network based Robust Denoising of Low-Dose Computed Tomography Perfusion Maps,” *IEEE Transactions on Radiation and Plasma Medical Sciences* **3**(2), 137–152 (2019).
48. S. Gutta, M. Bhatt, S. K. Kalva, M. Pramanik, S. Ganapathy, and **P. K. Yalavarthy**, “Modeling errors compensation with total least squares for limited data photoacoustic tomography,” *IEEE Journal of Selected Topics in Quantum Electronics (Issue on biophotonics)* **25**(1), 6800214 (2019).
47. D. R. Sanny, J. Prakash, S. K. Kalva, M. Pramanik, and **P. K. Yalavarthy**, “Spatially variant regularization based on model resolution and fidelity embedding characteristics improves photoacoustic tomography,” *Journal of Biomedical Optics* **23**(10), 100502 (2018).
46. N. Awasthi, S. K. Kalva, M. Pramanik, and **P. K. Yalavarthy**, “Image Guided Filtering for Improving Photoacoustic Tomographic Image Reconstruction,” *Journal of Biomedical Optics* **23**(9), 091413 (2018).
45. S. Gutta, S. K. Kalva, M. Pramanik, and **P. K. Yalavarthy**, “Accelerated image reconstruction using extrapolated Tikhonov filtering for photoacoustic tomography,” *Medical Physics* **45**(8), 3749–3767 (2018).
44. N. Awasthi, S. K. Kalva, M. Pramanik, and **P. K. Yalavarthy**, “Vector Extrapolation Methods for Accelerating Iterative Reconstruction Methods in Limited-Data Photoacoustic Tomography,” *Journal of Biomedical Optics* **23**(4), 041204 (2018).
43. S. Gutta, V. S. Kadimesetty, S. K. Kalva, M. Pramanik, S. Ganapathy, and **P. K. Yalavarthy**, “Deep Neural Network based Bandwidth Enhancement of Photoacoustic Data,” *Journal of Biomedical Optics* **22**(11), 116001 (2017).
42. N. Rao, H. Jeelani, R. Achalia, G. Achalia, A. Jacob, R. Bharath, S. Varambally, G. Venkatasubramanian, B. Gangadhar, and **P. K. Yalavarthy**, “Population differences in Brain morphology: Need for population specific Brain template,” *Psychiatry Research: Neuroimaging* **265**, 1–8 (2017).
41. M. Bhatt, A. Acharya, and **P. K. Yalavarthy**, “Computationally efficient error estimate for evaluation of regularization in photoacoustic tomography,” *Journal of Biomedical Optics* **21**(10), 106002 (2016).
40. M. Bhatt, S. Gutta, and **P. K. Yalavarthy**, “Exponential Filtering of Singular Values Improves Photoacoustic Image Reconstruction,” *Journal of the Optical Society of America A: Optics, Imaging Science, and Vision* **33**(9), 1785–1792 (2016).
39. M. Bhatt, K. R. Ayyalasomayajula, and **P. K. Yalavarthy**, “A Generalized Beer-Lambert Model for Near Infrared Light Propagation in Thick Biological Tissues,” *Journal of Biomedical Optics* **21**(7), 076012 (2016).
38. C. B. Shaw, Z. Li, B. W. Pogue, and **P. K. Yalavarthy**, “Direct sensitivity based data-optimization strategy for image-guided diffuse optical tomography,” *IEEE Journal of Selected Topics in Quantum Electronics (Issue on biophotonics)* **22**(3), 6803709 (2016).
37. J. Prakash, N. Todd, and **P. K. Yalavarthy**, “Prior Image based Temporally Constrained Reconstruction (PITCR) algorithm for Magnetic Resonance guided High Intensity Focused Ultrasound,” *Medical Physics* **42**(12), 6804–6814 (2015).
36. J. Prakash, N. Todd, and **P. K. Yalavarthy**, “Advances in Image Reconstruction Methods for Real-Time Magnetic Resonance Thermometry,” *Journal of the Indian Institute of Science (Special Issue on Magnetic Resonance Spectroscopy and Imaging)* **94**(4), 387–406 (2014). (*invited*)

paper).

35. J. Prakash, A. S. Raju, C. B. Shaw, M. Pramanik, and **P. K. Yalavarthy**, “Basis pursuit deconvolution for improving model-based reconstructed images in photoacoustic tomography,” *Biomedical Optics Express* **5**(5), 1363–1377 (2014).
34. C. B. Shaw and **P. K. Yalavarthy**, “Incoherence based optimal selection of independent measurements in diffuse optical tomography,” *Journal of Biomedical Optics* **19**(3), 036017 (2014).
33. C. B. Shaw and **P. K. Yalavarthy**, “Performance evaluation of typical approximation algorithms for non-convex ℓ_p -minimization in diffuse optical tomography,” *Journal of the Optical Society of America A: Optics, Imaging Science, and Vision* **31**(4), 852–862 (2014).
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28. R. P. K. Jagannath and **P. K. Yalavarthy**, “Non-Quadratic Penalization Improves Near Infrared Diffuse Optical Tomography,” *Journal of the Optical Society of America A: Optics, Imaging Science, and Vision* **30**(8), 1516–1523, 2013.
27. R. P. K. Jagannath and **P. K. Yalavarthy**, “An Efficient Gradient-Free Simplex Method for Estimation of Optical Properties in Image-Guided Diffuse Optical Tomography,” *Journal of Biomedical Optics* **18**(3), 030503 (2013).
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23. S. Ganesan and **P. K. Yalavarthy**, “Modeling of terahertz heating effects in realistic tissues,” *IEEE Journal of Selected Topics in Quantum Electronics (Issue on current trends in terahertz photonics and applications)* **19**(1), 8400908 (2013).

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21. C. B. Shaw and **P. K. Yalavarthy**, “Prior image-constrained ℓ_1 -norm-based reconstruction method for effective usage of structural information in diffuse optical tomography,” *Optics Letters* **37**(20), 4353–4355 (2012).
20. R. P. K. Jagannath and **P. K. Yalavarthy**, “Minimal Residual Method Provides Optimal Regularization Parameter for Diffuse Optical Tomography,” *Journal of Biomedical Optics* **17**(10), 106015 (2012).
19. C. B. Shaw and **P. K. Yalavarthy**, “Effective contrast recovery in rapid dynamic near-infrared diffuse optical tomography using ℓ_1 -norm-based linear image reconstruction method,” *Journal of Biomedical Optics* **17**(8), 086009 (2012).
18. D. Karkala and **P. K. Yalavarthy**, “Data-Resolution based Optimization of the Data-Collection Strategy for Near Infrared Diffuse Optical Tomography,” *Medical Physics* **39**(8), 4715–4725 (2012).
17. D. Thomas, **P. K. Yalavarthy**, D. Karkala, and V. Natarajan, “Mesh simplification based on edge collapsing could improve computational efficiency in near infrared optical tomographic imaging,” *IEEE Journal of Selected Topics in Quantum Electronics (Issue on biophotonics)* **18**(4), 1493–1501 (2012).
16. S. H. Katamreddy and **P. K. Yalavarthy**, “Model-Resolution based regularization improves near infrared diffuse optical tomography,” *Journal of the Optical Society of America A: Optics, Imaging Science, and Vision* **29**(5), 649–656 (2012).
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13. M. S. Singh, **P. K. Yalavarthy**, R. M. Vasu, and K. Rajan, “Assessment of ultrasound modulation of near infrared light on the quantification of scattering coefficient,” *Medical Physics* **37**(7), 3744–3751 (2010).
12. M. Soleimani, **P. K. Yalavarthy**, and H. Dehghani, “Helmholtz-type regularization method for permittivity reconstruction using experimental phantom data of electrical capacitance tomography,” *IEEE Transactions on Instrumentation and Measurement* **59**(1), 78–83 (2010).
11. S. Gupta, **P. K. Yalavarthy**, D. Roy, D. Piao, and R. M. Vasu, “Singular Value Decomposition based computationally efficient algorithm for rapid dynamic near-infrared diffuse optical tomography,” *Medical Physics* **36**(12), 5559–5567 (2009).
10. H. Dehghani, M. E. Eames, **P. K. Yalavarthy**, S. C. Davis, S. Srinivasan, C. M. Carpenter, B. W. Pogue, and K. D. Paulsen, “Near Infrared Optical Tomography using NIRFAST: Algorithms for Numerical Model and Image Reconstruction Algorithms,” *Communications in Numerical Methods in Engineering (Special Issue on Recent Advances in Computational Techniques for Biomedical Imaging)* **25**(6), 711–732 (2009).
9. **P. K. Yalavarthy**, D. R. Lynch, B. W. Pogue, H. Dehghani, and K. D. Paulsen, “Implementation of a computationally efficient least-squares algorithm for highly under-determined three-

- dimensional diffuse optical tomography problems,” *Medical Physics* **35**(5), 1682–1697 (2008).
8. S. Srinivasan, B. W. Pogue, C. M. Carpenter, **P. K. Yalavarthy**, and K. D. Paulsen, “A boundary element approach for image-guided near-infrared absorption and scatter estimation,” *Medical Physics* **34**(11), 4545–4557 (2007).
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 6. **P. K. Yalavarthy**, B. W. Pogue, H. Dehghani, C. M. Carpenter, S. Jiang, and K. D. Paulsen, “Structural information within regularization matrices improves near infrared diffuse optical tomography,” *Optics Express* **15**(13), 8043–8058 (2007).
 5. A. L. Darling, **P. K. Yalavarthy**, M. M. Doyley, H. Dehghani, and B. W. Pogue, “Interstitial fluid pressure in soft tissue as a result of externally applied contact pressure,” *Physics in Medicine and Biology* **52**(14), 4121–4136 (2007).
 4. **P. K. Yalavarthy**, B. W. Pogue, H. Dehghani, and K. D. Paulsen, “Weight-Matrix Structured Regularization Provides Optimal Generalized Least-Squares Estimate in Diffuse Optical Tomography,” *Medical Physics* **34**(6), 2085–2098 (2007).
 3. **P. K. Yalavarthy**, H. Dehghani, B. W. Pogue, and K. D. Paulsen, “Critical computational aspects of near infrared circular tomographic imaging: Analysis of measurement number, mesh resolution and reconstruction basis,” *Optics Express* **14**(13), 6113–6127 (2006).
 2. **P. K. Yalavarthy**, K. Karlekar, H. S. Patel, R. M. Vasu, M. Pramanik, P. C. Mathias, B. Jain, and P. K. Gupta, “Experimental investigation of perturbation Monte-Carlo based derivative estimation for imaging low-scattering tissue,” *Optics Express* **13**(3), 985–997 (2005).
 1. **P. K. Yalavarthy** and R. M. Vasu, “Reconstruction of optical properties of low-scattering tissue using derivative estimated through perturbation Monte-Carlo method,” *Journal of Biomedical Optics* **9**(5), 1002–1012 (2004).

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CONFERENCE
PROCEEDINGS

27. H. Ravishankar, P. Sudhakar, and **P. K. Yalavarthy**, “TTA-FM: Patient-Specific Test-Time Adaptation using Foundation Models for Improved Prostate Segmentation In Magnetic Resonance Images,” 2024 IEEE 21st International Symposium on Biomedical Imaging (ISBI), Athens, Greece, May 27-30, 2024 (accepted).
26. H. K. Aggarwal, **P. K. Yalavarthy**, and R. Langoju, “Self-supervised Noise-aware Kernel Synthesis for Improved X-ray Computed Tomography Imaging,” 2024 IEEE 21st International Symposium on Biomedical Imaging (ISBI), Athens, Greece, May 27-30, 2024 (accepted).
25. J. Prakash, D. Sanny, S. Kalva, M. Pramanik, and **P. K. Yalavarthy**, “Fractional regularization improves photoacoustic image reconstruction,” *Proc. SPIE 11642, Photons Plus Ultrasound: Imaging and Sensing 2021*, 1164236 (5 March 2021).
24. K. Krishnan, K. V. Reddy, B. Ajani, and **P. K. Yalavarthy**, “Rapid perfusion quantification using Welch-Satterthwaite approximation and analytical spectral filtering,” Paper ID: 101330Q, *Proc. SPIE 10133, Medical Imaging 2017*.
23. K. V. Reddy, A. Mitra, and **P. K. Yalavarthy**, “Fast Analytical Spectral Filtering Methods for Magnetic Resonance Perfusion Quantification,” Paper ID: WeCT5.17, *Proc. of 2016 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Florida, USA, August 16-20, 2016.
22. J. Prakash, N. Todd, and **P. K. Yalavarthy**, “Prior Image based Temporally Constrained

Reconstruction for Magnetic Resonance guided HIFU,” Abstract ID: 3610, ISMRM 24th Annual Meeting, Singapore, 2016.

21. **P. K. Yalavarthy**, K. V. Reddy, and J. Lee, “Magnetic Resonance Perfusion Quantification using QR-based Deconvolution,” Abstract ID: 2864, ISMRM 24th Annual Meeting, Singapore, 2016.

20. R. P. K. Jagannath and **P. K. Yalavarthy**, “Automated Choice of Regularization Parameter for Spatially Variant Regularization in Diffuse Optical Tomography,” SPIE/OSA European Conference on Biomedical Optics (ECBO-2013), May 12-16, 2013, Munich, Germany.

19. Y. N. Swamy and **P. K. Yalavarthy**, “Estimation of optimal regularization parameter using Morozov discrepancy principle for Diffuse optical Tomography,” SPIE/OSA European Conference on Biomedical Optics (ECBO-2013), May 12-16, 2013, Munich, Germany.

18. J. Prakash, V. Desai, S. Srinivasan, and **P. K. Yalavarthy**, “Multi-core computers have high scalability than graphics processing units for diffuse optical tomographic image reconstruction,” SPIE/OSA European Conference on Biomedical Optics (ECBO-2013), May 12-16, 2013, Munich, Germany.

17. C. B. Shaw and **P. K. Yalavarthy**, “Efficient compound regularization (ℓ_1 -TV) based reconstruction method for rapid dynamic diffuse optical tomography,” SPIE/OSA European Conference on Biomedical Optics (ECBO-2013), May 12-16, 2013, Munich, Germany.

16. P. K. Rakshatha, V. Vijaykumar, N. Sinha, and **P. K. Yalavarthy**, “Distinguishing cognitive states using iterative classification,” The Eighth Indian Conference on Vision, Graphics and Image Processing (ICVGIP-2012), 16-19 December, 2012.

15. N. Todd, J. Prakash, H. Odeen, J. de Bever, A. Payne, **P. K. Yalavarthy**, and D. L. Parker, “Towards real-time availability of 3-D temperature maps created with temporally constrained reconstruction,” ISMRM 20th Annual Meeting 2012, May 5-11, 2012, Melbourne, Australia. [*ISMRM Merit Award Summa Cum Laude; Top-10 posters of ISMRM-2012*]

14. R. P. K. Jagannath and **P. K. Yalavarthy**, “A semi-analytic method for continuous-wave diffuse optical tomography,” SPIE/OSA European Conference on Biomedical Optics (ECBO-2011), May 22-26, 2011, Munich, Germany.

13. **P. K. Yalavarthy**, D. A. Low, C. Noel, Z. Wei, D. Yang, A. Apte, J. Bradley, J. Deasy, and I. El Naqa, “Current role of PET in oncology: Potentials and challenges in the management of non-small cell lung cancer,” IEEE 42nd Annual Asilomar Conference on Signals, Systems, and Computers, 26-29 October 2008, Pacific Grove, California (*invited paper*).

12. M. Soleimani, C. N. Mitchell, J. R. Tong, H. Dehghani, and **P. K. Yalavarthy**, “Regularization of electrical impedance tomography imaging using Helmholtz operator,” Proc. of Electrical Impedance Tomography Conference 2008 (EIT 2008, 16-18 June 2008, Hanover, New Hampshire), 163–166 (2008).

11. M. E. Eames, B. W. Pogue, **P. K. Yalavarthy**, and H. Dehghani, “An efficient Jacobian reduction method for image reconstruction using Diffuse Optical Tomography,” Proc. of *OSA Biomedical Topical Meetings*, OSA Technical Digest, BSuE35:1-3, Optical Society of America, Washington, DC (2008).

10. **P. K. Yalavarthy**, R. Langoju, B. W. Pogue, H. Dehghani, A. Patil, and K. D. Paulsen, “Cramer-Rao estimation of error limits for diffuse optical tomography with spatial prior information,” Proc. of SPIE **6434** (BiOS-2007 in Photonics West-2007, 20-25 January 2007, San Jose, California), 643403:1-13 (2007).

9. S. C. Davis, H. Dehghani, **P. K. Yalavarthy**, B. W. Pogue, K. D. Paulsen, "Comparing two regularization techniques for diffuse optical tomography," Proc. of SPIE **6434** (BiOS-2007 in Photonics West-2007, 20-25 January 2007, San Jose, California), 64340X:1-12 (2007).
 8. H. Dehghani, C. M. Carpenter, **P. K. Yalavarthy**, B. W. Pogue, and J. P. Culver, "Structural a-priori Information in near infrared optical tomography," Proc. of SPIE **6431** (BiOS-2007 in Photonics West-2007, 20-25 January 2007, San Jose, California), 64310B:1-7 (2007).
 7. A. Darling, **P. K. Yalavarthy**, H. Dehghani, and B. W. Pogue, "Interstitial fluid pressure due to externally applied force in breast tissue," Proc. of SPIE **6431** (BiOS-2007 in Photonics West-2007, 20-25 January 2007, San Jose, California), 64310Z:1-10 (2007).
 6. **P. K. Yalavarthy**, C. Carpenter, S. Jiang, H. Dehghani, B. W. Pogue, and K. D. Paulsen, "Incorporation of MR structural information in diffuse optical tomography using Helmholtz type regularization," Proc. of *OSA Biomedical Topical Meetings*, OSA Technical Digest, SH29:1-3, Optical Society of America, Washington, DC (2006).
 5. C. Carpenter, B. W. Pogue, **P. K. Yalavarthy**, S. Davis, S. Jiang, H. Dehghani, and K. D. Paulsen, "Analysis of 3-dimensional reconstruction in a MR-guided NIR tomography system," Proc. of *OSA Biomedical Topical Meetings*, OSA Technical Digest, SH33:1-3, Optical Society of America, Washington, DC (2006).
 4. **P. K. Yalavarthy**, H. Dehghani, B. W. Pogue, and K. D. Paulsen, "Measurement optimization for Near-Infrared optical tomography," Proc. of SPIE **5693** (BiOS-2005 in Photonics West-2005, 22-27 January 2005, San Jose, California), 64-73 (2005).
 3. D. Piao, S. Jiang, S. Srinivasan, **P. K. Yalavarthy**, X. Song, and Brian W. Pogue, "Spectral-encoding for parallel source implementation in NIR tomography," Proc. of SPIE **5693** (BiOS-2005 in Photonics West-2005, 22-27 January 2005, San Jose, California), 129-136 (2005).
 2. **P. K. Yalavarthy**, Kirtish Karlekar, and R. M. Vasu, "Perturbation Monte-Carlo based derivative estimation for imaging transport regime tissue optical properties," Proc. of SPIE **5486** (ALT'03 International Conference on Advanced Laser Technologies: Biomedical Optics), 77-84 (2004).
 1. **P. K. Yalavarthy** and R. M. Vasu, "Perturbation Monte-Carlo based derivative estimation for imaging low-scattering inclusions in a heterogeneous tissue," Proc. of IEEE TENCON-2003:Conference on Convergent Technologies for Asia-Pacific Region, 529-533 (2003).
- CONFERENCE PRESENTATIONS (ABSTRACTS)
12. **P. K. Yalavarthy**, Z. Wei, J. Wen, P. Parikh, T. Zhao, J. Bradley, and D. A. Low, "A spatially-based binning method for improving the quantitative accuracy of free-breathing PET/CT images," Int. J. Radiat. Oncol. Biol. Phys. **72** (ASTRO annual meeting 2008, 21-25 September 2008, Boston, Massachusetts), S613-S614 (2008).
 11. T. Zhao, J. Bradley, C. Noel, **P. K. Yalavarthy**, P. Parikh, T. Yang, D. Yang, S. Mutic, and D. A. Low, "Application of five-dimensional breathing motion model for monitoring radiation damage," Med. Phys. **35** (AAPM annual meeting 2008, 27-31 July 2008, Houston, Texas), 2877 (2008).
 10. **P. K. Yalavarthy**, B. Pogue, and H. Dehghani, "A generalized least-squares minimization method for near infrared diffuse optical tomography," Department of Defense Era of Hope Meeting, Baltimore, Maryland 25-28 June 2008 (*invited presentation*).
 9. S. Srinivasan, B. W. Pogue, C. Carpenter, **P. K. Yalavarthy**, and K. D. Paulsen, "A Boundary Element Approach for Image-guided Near-Infrared Absorption and Scatter Estimation," Network for Translational Research Optical Imaging Network (NTRIO) Retreat, Hyatt Regency Newport Beach, CA, June 28-30, 2007.

8. B. W. Pogue, C. M. Carpenter, **P. K. Yalavarthy**, S. C. Davis, J. Wang, and K. D. Paulsen, "Recovery of hemoglobin images from MR-guided NIR spectroscopy," *SPIE Medical Imaging-2007*, San Diego, California, 17-22 February 2007.
7. B. W. Pogue, C. M. Carpenter, **P. K. Yalavarthy**, H. Dehghani, S. Jiang, X. Wang, W. A. Wells, C. A. Kogel, S. P. Poplack, J. B. Weaver, and K. D. Paulsen, "Proposed methods to improve false positive and false negative rates in MR breast imaging, through combination with NIR broadband spectroscopy/tomography," *BiOS-2007 in Photonics West-2007*, San Jose, California, 20-25 January 2007 (*invited presentation*).
6. **P. K. Yalavarthy**, B. W. Pogue, H. Dehghani, S. Jiang, and K. D. Paulsen, "Generalized Least-Squares minimization for Magnetic Resonance guided Diffuse Optical Tomography," *BiOS-2007 in Photonics West-2007*, San Jose, California, 20-25 January 2007.
5. **P. K. Yalavarthy**, B. W. Pogue, H. Dehghani, S. Jiang, and K. D. Paulsen, "Outline of the Weighted Least-Squares minimization for Diffuse Optical Tomography," Network for Translational Research Optical Imaging Network (NTROI) Retreat, Hyatt Regency Newport Beach, CA, June 22-24, 2006.
4. **P. K. Yalavarthy**, Kirtish Karlekar, and R. M. Vasu, "Design of a time-domain optical tomography imager for imaging tissue with low-scattering coefficient," Int. Conf. on Laser Applications and Optical Metrology (ICLAOM-03), IIT Delhi, India, Dec. 1-4, 2003.
3. **P. K. Yalavarthy** and R. M. Vasu, "Optical inhomogeneity reconstruction in tissue with low scattering inclusions using derivative estimated through perturbation Monte-Carlo," National Symposium on Engg. Optics (NSEO-03), Meerut College, Meerut, India, April-2003.
2. **P. K. Yalavarthy**, "Perturbation Monte-Carlo (pMC) Technique: A novel Imaging modality in optical tomography," Lamp-Workshop, Winter college on bio-photonics, ICTP, Trieste, Italy, February 10-21, 2003.
1. R. M. Vasu and **P. K. Yalavarthy**, "Efficient calculation of Jacobian for solving the inverse photon transport problem in the Tissue," Conference on Optics and Photonics in Engineering (COPE-03), New Delhi, India, Jan-2003.

TECHNICAL REPORTS

4. C. Carpenter and **P. K. Yalavarthy**, *2-D Plotting of Finite Difference or Finite Element Solutions with Tecplot*, NML Lab Report, NML-07-1, Dartmouth College, February 2007.
3. **P. K. Yalavarthy**, *Derivation of an alternative form for generalized least-squares update equation in Diffuse Optical Tomography*, NML Lab Report, NML-06-10, Dartmouth College, July 2006.
2. **P. K. Yalavarthy** and D. R. Lynch, *Generalized Least-Squares minimization for Diffuse Optical Tomography: Use of Complex data*, NML Lab Report, NML-06-9, Dartmouth College, July 2006.
1. **P. K. Yalavarthy**, P. R. Perrinez, and Keith D. Paulsen, *Integration formulas for tetrahedral element*, NML Lab Report, NML-06-8, Dartmouth College, May 2006.

THESES

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

- 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), Puttaparthi.
- 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:

26. 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)

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

Completed:

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: ~\$57,000
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.