

Atul Ingle

Postdoctoral Research Associate
Departments of Computer Science and Biostatistics
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Research Interests

Computational imaging, statistical signal processing, inverse problems in medical imaging

Education

- Ph.D., University of Wisconsin-Madison 2015
Department of Electrical and Computer Engineering
Advisor: Prof. Tomy Varghese
- M.S., University of Wisconsin-Madison 2011
Department of Electrical and Computer Engineering
Advisor: Prof. William Sethares
- B. Tech. Electronics Engineering, Veermata Jijabai Technological Institute 2009
University of Mumbai (Bombay), India

Work Experience

- Postdoctoral Research Associate, University of Wisconsin-Madison** 2017–
Departments of Computer Science and Biostatistics
Advisors: Prof. Mohit Gupta and Prof. Andreas Velten
- Research Scientist, Fitbit Inc., Boston, MA.** 2015–2017
Supervisor: Eric Foxlin
- Visiting Researcher, Philips Healthcare, Andover, MA.** Summer 2013, Fall 2014
Host: Dr. Abhay Patil
- Research Assistant, University of Wisconsin-Madison** 2011–2015
Departments of Electrical and Computer Engineering, and Medical Physics
- Project Assistant, University of Wisconsin-Madison** 2010–2011
UW-Madison Radio Frequency Identification Lab

Awards and Honors

Best Paper (Marr Prize) Honorable Mention November 2019
IEEE International Conference on Computer Vision (ICCV), Seoul, South Korea

Veerмата Jijabai Technological Institute Gold Medal August 2009
Undergraduate class of 2009

Recent Publications

A. Gupta*, **A. Ingle***, M. Gupta, “Asynchronous Single-Photon 3D Imaging” IEEE Proc. ICCV, 2019 (**Marr Prize Honorable Mention**).

www.SinglePhoton3DImaging.com

A. Ingle, A. Velten, M. Gupta, “High Flux Imaging with Single-Photon Sensors,” IEEE Proc. CVPR, 2019 (**oral presentation, 5.6% acceptance rate**)

wisionlab.cs.wisc.edu/project/spad-hdr/

A. Gupta, **A. Ingle**, M. Gupta, A. Velten, “Photon-Flooded Single-Photon 3D Cameras,” IEEE Proc. CVPR, 2019 (**oral presentation, top 5.6% acceptance rate**)

wisionlab.cs.wisc.edu/project/spad-lidar/

Older Publications

Journals

- (J8) **A. Ingle**, T. Varghese, “A Kernel Smoothing Algorithm for Ablation Visualization in Ultrasound Elastography,” *Ultrasonics*, vol. 96, pp. 267–275 (2019).
- (J7) **A. Ingle**, T. Varghese, W. Sethares, “Efficient 3D Reconstruction in Ultrasound Elastography via a Sparse Iteration based on Markov Random Fields,” *IEEE Trans. Ultrason., Ferroelectr., Freq. Control*, vol. 64, no. 3, pp. 491–499 (2017).
- (J6) W. Yang, T. Ziemlewicz, T. Varghese, M. Alexander, N. Rubert, **A. Ingle**, M. Lubner, J. Hinshaw, F. Lee Jr., J.A. Zagzebski, “Post-Procedure Evaluation of Microwave Ablations of Hepatocellular Carcinomas using Electrode Displacement Elastography,” *Ultrasound in Med. Biol.*, vol. 42, no. 12, pp. 2893–2902 (2016).
- (J5) W. Yang, **A. Ingle**, T. Varghese, “Comparison of Three Dimensional Strain Volume Reconstructions using SOUPR and Wobbler Based Acquisitions: A Phantom Study,” *Med. Phys.*, vol. 43, no. 4, pp. 1615 (2016).
- (J4) **A. Ingle**, J. Bucklew, W. Sethares, T. Varghese, “Slope estimation in noisy piecewise linear functions,” *Elsevier Sig. Proc.*, vol. 108, pp. 576–588 (2015).
- (J3) **A. Ingle**, C. Ma, T. Varghese, “Ultrasonic Tracking of Shear Waves using a Particle Filter,” *Med. Phys.*, vol. 42, no. 11, pp. 6711–6725 (2015).

- (J2) **A. Ingle**, T. Varghese, "C-plane reconstruction of ablations in ultrasound shear wave elastography using a sheaf of planes," *IEEE Trans. Med. Imag.*, vol. 33, no. 8, pp. 1677–1688 (2014).
- (J1) **A. Ingle**, W. Sethares, "The least-squares invertible constant-Q spectrogram and its application to phase vocoding," *J. Acoust. Soc. Am.*, vol. 132, no. 2, pp. 894–903 (2012).

Conference Publications

- (C10) **A. Ingle**, T. Varghese, "3D Reconstruction of Ablations in Shear Wave Elastography Using the Matérn Kernel," *IEEE IUS* 2017.
- (C9) **A. Ingle**, T. Varghese, "C-plane Reconstructions from Sheaf Acquisition for Ultrasound Electrode Vibration Elastography," *IEEE Ultrasonics Symposium* 2014.
- (C8) **A. Ingle**, T. Varghese, "Three Dimensional Shear Wave Elastographic Reconstruction of Ablations," *IEEE EMBC* 2014.
- (C7) **A. Ingle**, T. Varghese, W. Sethares, J. Bucklew, "Stochastic Piecewise Linear Function Fitting with Application to Ultrasound Shear Wave Imaging," *IEEE EMBC* 2014.
- (C6) **A. Ingle**, William Sethares, Tomy Varghese, James Bucklew, "Piecewise Linear Slope Estimation," *Asilomar* 2014.
- (C5) William Sethares, **A. Ingle**, Tomas Krc, Sally Wood, "Eigentextures: An SVD Approach to Automated Paper Classification," *Asilomar* 2014.
- (C4) **A. Ingle**, T. Varghese, "A Huber-penalized Akaike-regularized broken-stick least squares regression algorithm for shear wave velocity reconstruction," *AIUM Annual Convention* 2013, Apr. 2013.
- (C3) **A. Ingle**, T. Varghese, "Stochastic hidden Markov model based filtering algorithm for tracking shear waves through disparate media in electrode vibration elastography," *AIUM Annual Convention* 2013, Apr. 2013.
- (C2) **A. Ingle**, T. Varghese, "A Comparison of Model Based and Direct Optimization Based Filtering Algorithms for Shear Wave Velocity Reconstruction for Electrode Vibration Elastography," in *Proc. Int. Symp. Biomed. Imag.*, Apr. 2013.
- (C1) A. Gutierrez, C. Hohberger, F.D. Nicolalde, **A. Ingle**, W. Hochschild, R. Davis, and R. Veeramani, "High-Frequency RFID Tag Survivability in Harsh Environments," in *Proc. IEEE Int RFID Conf*, pp. 58–65, May 2013.

Intellectual Property

Systems, methods and media for asynchronous single-photon depth imaging with improved precision in ambient light (US patent application filed June 2019)

Systems, methods, and media for high dynamic range imaging using dead-time-limited single photon detectors (US Patent App. 16/047,933)

Evaluation of cardiac infarction by realtime ultrasonic strain imaging (US Patent App. 15/545,748, International Patent App. PCT/IB2016/050308)

Method and apparatus for rapid acquisition of elasticity data in three dimensions (US Patent 9,913,624).

Method and apparatus for rapid acquisition of elasticity data in three dimensions (US Patent 10,488,247).

Talks

“Single-Photon Cameras,” Boston University ECE Department Seminar (December 2019)

“Single-Photon Cameras,” MIT-RLE DARPA Team Meeting, Cambridge, MA (December 2019)

“Single-Photon Cameras,” MIT Media Lab Camera Culture Group, Cambridge, MA (December 2019)

“Single-Photon 3D Imaging,” EPFL AQUA Lab, Neuchâtel, Switzerland (November 2019)

“General-Purpose Passive Imaging with Single-Photon Sensors,” Single-Photon Workshop, Milan, Italy (October 2019)

News/Media

“How Signal Processing Counts your Steps,” IEEE Signal Processing Society Blog (Invited), June 7, 2017.

Professional Service

Reviewer (Journals)

IEEE Trans. Computational Imaging; IEEE Trans. Medical Imaging; IEEE Trans. on Ultrasonics, Ferroelectrics and Freq. Control; Elsevier Signal Processing; Medical Physics; J. Acoustical Society of America; PLoS ONE

Reviewer (Conferences)

IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE International Conference on Computational Photography (ICCP)

Teaching Experience

Undergraduate Engineering and Math Tutor Fall 2018, Fall 2019
Calculus, linear algebra, probability, signal processing (Greater University Tutoring Service, University of Wisconsin-Madison)

Teaching Assistant Fall 2011, Fall 2013
Undergraduate courses in probability and digital signal processing (Department of Electrical and Computer Engineering, University of Wisconsin-Madison)

References

Prof. Andreas Velten
Asst. Professor, Dept. of Biostat. and ECE, UW-Madison, Madison, WI
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Prof. Mohit Gupta
Asst. Professor, Dept. of Computer Sciences, UW-Madison, Madison, WI
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Prof. Tomy Varghese
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