Abijith Jagannath Kamath

PhD Student, Department of Electrical Engineering,
Indian Institute of Science, Bengaluru, India 560 012
Email: abijithj@iisc.ac.in — Webpage: kamath-abhijith.github.io

EDUCATION

Indian Institute of Science (IISc.), Bengaluru, India — 2020 – present
PhD in Electrical Engineering — CGPA: 8.90/10
Thesis Title: Neuromorphic Sampling — Theory and Algorithms

Selected Coursework: Time-Frequency Analysis, Convex Optimisation and Applications, Digital Image Processing, Stochastic Models and Applications, Pattern Recognition and Neural Networks, Advanced Convex Optimisation, Computational Imaging

National Institute of Technology Karnataka (NITK), Surathkal, India — 2015 – 2019
Bachelor of Technology in Electrical and Electronics Engineering — CGPA: 9.17/10
Thesis Title: Signals, Shapes and Fourier Descriptors

Selected Coursework: Digital Signal Processing, Matrix Theory and Stochastic Processes, Advanced Digital Signal Processing, Information Theory

WORK EXPERIENCE

Indian Institute of Science
Project Assistant — 2019

- Project title: Neuromorphic Sampling
- Funding agencies: Pratiksha Trust, Institute of Eminence *(IoE)* Fund

ACTIVITIES AND RECOGNITIONS

- Awards
  - Recipient of the *Prime Minister's Research Fellowship*
- Professional Activities (selected)
  - *Vice-Chair*, IEEE IISc. *SPS* Student Chapter — 2020 – 21
  - *Student Branch Secretary*, IEEE NITK Student Branch — 2018 – 19
- Refereed Publications
  - Asilomar Conference on Signals, Systems and Computers
  - IEEE Int. Conf. Acoust. Speech Signal Process. (ICASSP)
  - Int. Conf. Sampling Theory and Applications (SampTA)
  - IEEE Int. Conf. Signal Process. Comm. (SPCOM)
  - Elsevier Signal Processing

REFEREES

Prof. Chandra Sekhar Seelamantula
Professor, Department of Electrical Engineering, IISc.
E-mail: css@iisc.ac.in — Scholar Profiles: Webpage — Google Scholar

Dr CMC Krishnan
Assistant Professor, Department of Electrical and Electronics Engineering, NITK
E-mail: cmckrishnan@nitk.edu.in — Scholar Profiles: Google Scholar

TEACHING

Teaching Assistant at IISc.

- E9 213 Time-Frequency Analysis 2021 – 23
- E9 241-O Digital Image Processing 2022 – 23
- E9 222 Signal Processing in Practice 2023
- E9 310 Computational Imaging 2024

Teaching Assistant at NITK

- EE 313/386 Digital Signal Processing 2021 – 22
- EE 343 Statistical Foundations for Electrical Engineers 2021 – 23
- EE 143 Mathematics for Electrical Engineers 2019

PUBLICATIONS

Journal Articles

1. K. K. R. Nareddy, **A. J. Kamath**, and C. S. Seelamantula, "Tight-frame-like analysis-sparse recovery using non-tight sensing matrices," *SIAM J. Imag. Sci.*, 2024. DOI: 10.1137/23M1625846

Preprints

3. **A. J. Kamath** and C. S. Seelamantula, "Neuromorphic sampling of sparse signals," 2023, [Online]. Available: https://arxiv.org/abs/2310.15750

2. **A. J. Kamath** and C. S. Seelamantula, "Neuromorphic sampling of signals in shift-invariant spaces," 2023, [Online]. Available: https://arxiv.org/abs/2306.05103

1. **A. J. Kamath**, S. Rudresh, and C. S. Seelamantula, "Time encoding of finite-rate-of-innovation signals," 2021, [Online]. Available: https://arxiv.org/abs/2107.03344

Conference Articles

10. **A. J. Kamath** and C. S. Seelamantula, "Neuromorphic unlimited sampling for high-dynamic-range video acquisition," in *IEEE Int. Conf. Acoust., Speech, Signal Process. (ICASSP)*, (invited paper), 2025

9. **A. J. Kamath**, A. S. Bhandiwad, and C. S. Seelamantula, "On the design of weakly-convex regularizers for solving linear inverse problems," in *IEEE Int. Conf. Acoust., Speech, Signal Process. (ICASSP)*, 2025

8. **A. J. Kamath**, K. K. R. Nareddy, and C. S. Seelamantula, "Method of alternating proximations for solving linear inverse problems," in *Proc. IEEE Int. Conf. Signal Process. Comm. (SPCOM)*, 2024. DOI: 10.1109/SPCOM60851.2024.10631653

7. **A. J. Kamath** and C. S. Seelamantula, "Neuromorphic sensing meets unlimited sampling," in *Proc. IEEE Int. Conf. Acoust., Speech, Signal Process. (ICASSP)*, 2024. DOI: 10.1109/ICASSP48485.2024.10447840

6. K. K. R. Nareddy, **A. J. Kamath**, and C. S. Seelamantula, "Image restoration with generalized $L2$ loss and convergent plug-and-play prior," in *Proc. IEEE Int. Conf. Acoust., Speech, Signal Process. (ICASSP)*, 2024. DOI: 10.1109/ICASSP48485.2024.10446244

5. A. S. Bhandiwad, **A. J. Kamath**, S. Asokan, *et al.*, "Variational analysis of adversarial regularization for solving inverse problems," in *Proc. IEEE Int. Conf. Acoust., Speech, Signal Process. (ICASSP)*, 2024. DOI: 10.1109/ICASSP48485.2024.10446385

4. **A. J. Kamath** and C. S. Seelamantula, "Multichannel time-encoding of finite-rate-of-innovation signals," in *Proc. IEEE Int. Conf. Acoust., Speech, Signal Process. (ICASSP)*, 2023. DOI: 10.1109/ICASSP49357.2023.10096150

3. **A. J. Kamath** and C. S. Seelamantula, "Differentiate-and-fire time-encoding of finite-rate-of-innovation signals," in *Proc. IEEE Int. Conf. Acoust., Speech, Signal Process. (ICASSP)*, 2022. DOI: 10.1109/ICASSP43922.2022.9746159

2. S. Rudresh, **A. J. Kamath**, and C. S. Seelamantula, "A time-based sampling framework for finite-rate-of-innovation signals," in *Proc. IEEE Int. Conf. Acoust., Speech, Signal Process. (ICASSP)*, 2020, pp. 5585–5589. DOI: 10.1109/ICASSP40776.2020.9053120

1. **A. J. Kamath**, S. Rudresh, and C. S. Seelamantula, "FRI modelling of Fourier descriptors," in *Proc. IEEE Int. Conf. Acoust., Speech, Signal Process. (ICASSP)*, 2019, pp. 5092–5096. DOI: 10.1109/ICASSP.2019.8682685

INVITED TALKS AND DEMONSTRATIONS

2. S. Kulur, S. Anand, **A. J. Kamath**, *et al.*, *Modulo sampling meets neuromorphic encoding -- A hardware proof*, IEEE Int. Conf. Acoust., Speech, Signal Process. (ICASSP), Show-and-tell Demo, 2024

1. **A. J. Kamath** and C. S. Seelamantula, "Neuromorphic sampling," in *Asilomar Conf. Signals Syst. Comput. (ACSSCS)*, 2021

PATENTS

1. S. Kulur, S. Anand, **A. J. Kamath**, *et al.*, *A neuromorphic unlimted sampling method and a plug-and-play system thereof*, Indian Patent 202441018543 (in process), 2024