Siddarth Asokan

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Anandnagar, Bengaluru - 560024, Karnataka, India
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EXPERIENCE

Research Software Development Engineer II *2023 (Nov) – Current*
Microsoft Research Lab, India *(MSRI)*
Vigyan, No. 9, Lavelle Road, Bengaluru

- **Group Lead:** Dr. Manik Varma
- **Areas of research:** Extreme Classification, Generative modeling, Information Search and Retrieval

Project Associate *2023 (Aug – Oct)*
Spectrum Lab, Department of Electrical Engineering
Indian Institute of Science, Bengaluru

- **Group Lead:** Prof. Chandra Sekhar Seelamantula
- **Areas of research:** Langevin diffusion models, High-dimensional Interpolation, Variational Calculus, Fourier analysis, Discriminator Guidance in Score-based Diffusion

ACADEMIC BACKGROUND

Doctor of Philosophy (Ph.D.) *2017 – 2023*
*(**Thesis Defended**: September 15th, 2023)* GPA: 9.80/10
Robert Bosch Center for Cyber-Physical Systems *(RBCCPS)*
Indian Institute of Science *(IISc.)*, Bengaluru

- **Thesis Title:** On the Optimality of Generative Adversarial Networks — A Variational Perspective
- **Areas of research:** Generative modeling, Generative adversarial networks, Langevin diffusion models, High-dimensional Interpolation, Variational Calculus, Fourier analysis, Learning in Low-data Regimes, Transfer Learning
- Also awarded **Masters of Technology (M. Tech.) (Research)** Degree along with the Ph.D. degree.
- **Supervisor:** Prof. Chandra Sekhar Seelamantula
- **Selected coursework:** Linear and Non-linear Optimization, Image Processing, Machine Learning for Signal Processing, Pattern Recognition, Reinforcement Learning, Autonomous Navigation, Stochastic Approximation Algorithms, Dynamics of Linear Systems

Bachelor of Engineering (B.E.) *2013 – 2017*
(Electronics and Communication Engineering) GPA: 9.96/10
M. S. Ramaiah Institute of Technology *(MSRIT)*, Bengaluru,

- **Rank**: University 1st Rank, Gold Medal
- **Project Title:** Smart Parking and Surveillance
- **Selected coursework:** Linear Algebra, Probability Theory, Numerical Methods, Signals and Systems, Digital Signal Processing, Information Theory

INTERNSHIP

B.E. Project Intern 2016 – 2017

Robert Bosch Center for Cyber-Physical Systems, IISc. Bangalore

- **Project Title:** Image Processing and Networking for Smart City Applications
- **Supervisors:** Prof. Bharadwaj Amrutur and Dr. Abhay Sharma

ACCOLADES

Fellowships

- Super Winner – Qualcomm Innovation Fellowship (All-India competitive) 2023
- Winner – Qualcomm Innovation Fellowship (All-India competitive) 2022
- Winner – RBCCPS Ph.D. Fellowship (Institute competitive) 2021
- Winner – Qualcomm Innovation Fellowship (All-India competitive) 2021
- Winner – RBCCPS Ph.D. Fellowship (Institute competitive) 2020
- Finalist – Qualcomm Innovation Fellowship (All-India competitive) 2020
- Winner – Qualcomm Innovation Fellowship (All-India competitive) 2019
- Winner – Microsoft Research (MSR) Ph.D. Fellowship (Institute Selective) 2018

Awards

- Best Presenter – 14th IISc EECS Symposium – AI/ML Track 2023
- Gold Medal – B.E. (Highest Cumulative GPA - MSRIT, Class of 2017) 2017
- Runners up – Best Project (MSRIT, Class of 2017) 2017
- Finalist – Quest Global INGENIUM Competition (All-India – Top 10) 2017
- Runners up – Ideathon (IISc – MSRIT Symposium on Smart Cities) 2017
- College 2nd Rank – M.E.S. Pre-university College (State 10th Rank) 2013
- School 2nd Rank – Poorna Prajna Education Center (State 11th Rank) 2011

PROFESSIONAL ACTIVITIES

Talks

1. **"On the Optimality of GANs – A Variational Perspective,"** *BMVC Doctoral Consortium 2023*, Aberdeen, UK, **November 23, 2023**.
2. **"Demystifying Generative AI – From Generative Adversarial Networks to Diffusion Models,"** *EE Summer School (EESS) 2023*, Electrical Engineering Department, IISc, **July 5, 2023**.
3. **"The Optimality of Gradient-regularized GANs – Theory and Practice,"** *The 14th IISc Division of Electrical, Electronics and Computer Science (EECS) Student Research Symposium 2023,* IISc, **April 3, 2023**.
4. **"Demystifying the Optimal Generator in GANs,"** *Qualcomm Innovation Fellowship 2022 – Mid-term Presentation, (Virtual)*, **February 20, 2023**.
5. **"An Introduction to GANs and Diffusion Models,"** *EE Summer School 2022*, Electrical Engineering Department, IISc, **July 7, 2022**.
6. **"Teaching a GAN What Not to Learn,"** *The 13th IISc EECS Student Research Symposium,*, IISc, **April 3, 2022**
7. **"The Optimal Discriminator in GANs,"** *Qualcomm Innovation Fellowship 2021 – Mid-term Presentation, (Virtual)*, **January 31, 2022**.
8. **"Teaching a GAN What Not to Learn,"** *The ACM India Joint International Conference on Data Science and Management of Data (CODS-COMAD), Premier Paper Track,* (Virtual), **January 4, 2021**.

9. **"ELeGANt - Euler-Lagrange Constraints for Generative Adversarial Networks,"** *Qualcomm Innovation Fellowship 2019 – Mid-term Presentation*, Qualcomm, Bengaluru, **January 31, 2020**.

Refereed Publications

- Advances in Neural Information Processing Systems (NeurIPS) 2021 – present
- Intl. Conf. on Acoustics, Speech, Signal Processing (ICASSP) 2021 – present
- International Conference on Learning Representations (ICLR) 2021 – present
- International Conference on Machine Learning (ICML) 2021 – present
- International Conference on Image Processing. (ICIP) 2019, 2020

SKILLS

Programming Languages and Libraries

- Python: *NumPy, SciPy, TensorFlow (1.0 and 2.0), Keras, PyTorch,*
- Others: C, C++, MATLAB

Documentation

- LaTeX
- Markdown

TEACHING

Teaching Assistant at IISc.

- E9-241 – Digital Image Processing August–December 2019
- E9-241(O) – Digital Image Processing (Online) Aug–Dec 2021, 2022, 2023

PUBLICATIONS

GOOGLE SCHOLAR

Journal Publications

[**J1**] **S. Asokan** and C. S. Seelamantula, "Euler-Lagrange Analysis of Generative Adversarial Networks," *Journal of Machine Learning Research* ***(JMLR)***, 1–100, 2023 (Link)

Conference Publications

[**C1**] N. Shetty, M. Bandla, N. Neema, **S. Asokan** and C. S. Seelamantula, "Momentum-imbued Langevin Dynamics (MILD) for Faster Sampling," *In Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing* ***(ICASSP) 2024***, to be held in Seoul, Korea

[**C2**] A. S. Bhandiwad, A. J. Kamath, **S. Asokan** and C. S. Seelamantula, "Variational Analysis of Adversarial Regularization for Solving Inverse Problems," *In Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing* ***(ICASSP) 2024***, to be held in Seoul, Korea

[**C3**] **S. Asokan** and C. S. Seelamantula, "Spider GAN: Leveraging Friendly Neighbors to Accelerate GAN Training," *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition* ***(CVPR) 2023***, Vancouver, Canada (Link)

[**C4**] **S. Asokan**, F. S. Mohammed and C. S. Seelamantula, "A Game of Snakes and GANs," *In Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing* ***(ICASSP) 2023***, Rhodes Island, Greece **(Oral Presentation)** (Link)

[**C5**] **S. Asokan** and C. S. Seelamantula, "Teaching a GAN What Not to Learn," *In Advances in Neural Information Processing Systems* ***(NeurIPS) 2020***, Vancouver, Canada (Link)

Workshop Publications

[**W1**] **S. Asokan**, N. Shetty, A. Srikanth and C. S. Seelamantula, "f-GANs Settle Scores!," *In The "Workshop on Diffusion Models" at* ***NeurIPS 2023***, (Link)

[**W2**] **S. Asokan** and C. S. Seelamantula, "ELeGANt: Euler-Lagrange Analysis of Wasserstein Generative Adversarial Networks," *In "DLDE - III" at* ***NeurIPS Workshops 2023***, New Orleans, USA (**Spotlight Presentation**) (Link)

[**W3**] **S. Asokan** and C. S. Seelamantula, "LSGANs with gradient regularizers are smooth high-dimensional interpolators," *In "INTERPOLATE: First Workshop on Interpolation and Beyond" at* ***NeurIPS Workshops 2022***, New Orleans, USA (Link)

[**W4**] **S. Asokan** and C. S. Seelamantula, "Bridging the Gap Between Coulomb GAN and Gradient-regularized WGAN," *In "The Symbiosis of Deep Learning and Differential Equations (DLDE) - II" at* ***NeurIPS Workshops 2022***, New Orleans, USA (**Spotlight Presentation**) (Link)

Preprints and Manuscripts Under Review

[**P1**] **S. Asokan**, N. Shetty, A. Srikanth and C. S. Seelamantula, "GANs Settle Scores!," *arXiv preprints, arXiv:2306.00785,* ***(arXiv) 2023,*** (Link)

[**P2**] **S. Asokan** and C. S. Seelamantula, "Data Interpolants – That's What Discriminators in Higher-order Gradient-regularized GANs Are," *arXiv preprints, arXiv:2306.01654,* ***(arXiv) 2023,*** (Link)

[**P3**] **S. Asokan**, N. Shetty, A. Srikanth and C. S. Seelamantula, "FoLD: Fourier-series-based Score Estimation for Langevin Diffusion," *Under Review.*

REFEREES

- *Prof. Chandra Sekhar Seelamantula*
  Professor, Department of Electrical Engineering, IISc.
  `css@iisc.ac.in`
- *Prof. Bharadwaj Amrutur*
  Chair, Robert Bosch Center for Cyber-Physical Systems, IISc.
  Professor, Department of Electrical Communication Engineering, IISc.
  `amrutur@iisc.ac.in`
- *Prof. P. S. Sastry*
  Professor, Department of Electrical Engineering, IISc.
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- *Prof. Shalabh Bhatnagar*
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