Saumya Vilas Roy

+91 8826433226 — saumyaroy@tutanota.com — Github — New Delhi, India

SUMMARY

- Machine Learning/Deep Learning enthusiast with 2.5 years of data analysis experience.
- Skilled in ML, DL and biomedical data analysis with a strong electronics and communication engineering background.
- Proven track record of developing innovative solutions in interdisciplinary projects.
- Seeking ML research opportunities in health and biomedical applications.

EDUCATION

- Bachelor of Technology in Electronics and Communication Engineering, Nov 2020 - May 2024
  Indian Institute of Space Science and Technology (IIST), Kerala CG-PA: 7.28/10
  - Developed a novel method for estimating non-uniform temperature profiles in combustion systems using Laser Absorption Spectroscopy (LAS) and Multi-Output Gaussian Process Regression.
  - Scholarship from Department of Space, Govt. of India.
- High School Diploma, XII (Central Board of Secondary Education), 2018 - 2020
  Ryan International School, New Delhi (2020) Percentage: 90.6 %

EXPERIENCE

- Research Intern, June 2024 - Current
  Indian Institute of Technology, Delhi
  - Spearheaded the development of a deep learning-based computer vision technique to categorize and identify damage on wheat grain kernels post-harvest with Dr. Ankur Miglani (Indian Institute of Technology, Indore).
  - Designed and implemented an AI-driven safety edge device (esp32) to prevent accidents in construction environments by alerting on unsafe behavior with Dr. Husain Kanchwala (Indian Institute of Technology, Delhi).
- Summer Intern, May 2023 - August 2023
  National Remote Sensing Center, Indian Space Research Organization
  - Developed and applied a U-net Complex Valued Neural Network for segmenting raw PolSAR images using the Pauli representation with Dr. Deepak Mishra (IIST) to analyze the effect of different dropout rates on model overfitting and enable image analysis without domain shift.
- Undergraduate Researcher, Aug 2021 - May 2024
  Indian Institute of Space Science and Technology
  - Collaborated with Prof. Marcos M. Raimundo (University of Campinas, Brazil) and Prof. Mishra on a research project focused on developing a semi-supervised learning approach with spatial transformers for medical image registration, utilizing a hybrid dataset of real and synthetic images to investigate the impact of transfer learning and reduce data requirements.
  - Created and validated a Schlieren/RGB Flame Images Analyzing Tool based on Fast Fourier Transform (FFT) and Wavelet Transform to analyze time-series flame images to identify the region of instability and the corresponding oscillating frequency in collaboration with Dr. Rajesh Sadananan (IIST).

– Conducted and analyzed Complex Network Analysis of the OPEC Crude Oil Trade Network with Dr. Manoj B.S. (IIST), quantifying the global crude oil markets and effects of world events on the demand and price of crude oil along with analysis of effective of OPEC cartel in control of crude oil trade.

SKILLS

- **Languages:** Python, C++, MATLAB, JavaScript, HTML/CSS, SQL.
- **Developer Tools:** Git, GNU Octave, LaTeX, AWS.
- **Libraries:** TensorFlow, PyTorch, Keras, OpenCV.

AWARDS/RECOGNITIONS

- 3^{rd} position in student's flash talks at Frontiers symposium in Data science 2024, IISER Trivandrum.CVNN
- Ranked among the top 2% of over 1 million candidates in the Joint Entrance Examination (JEE) Advanced.
- Won 1st position in Tinker Fest 2018 organized by Atal Tinkering Labs for the project "Algae Based Air Purifier and Quality Sensor" at Ryan International School.

PUBLICATIONS

- **Saumya Vilas Roy***, Husain Kanchwala & Ankur Miglani. Deep CNN-based damage classification of milled wheat grains using a high-magnification image dataset. (Manuscript in preparation).
- **Saumya Vilas Roy***, Deepak Mishra & Marcos M. Raimundo. HybridMorph: Bridging the Gap between Synthetic and Real Data for Accurate MR Image Registration. (Manuscript in preparation).
- **Saumya Vilas Roy***, Deepak Mishra, Satheesh K. & Rajesh Sadananan. Estimating Non-Uniform Temperature Profiles in Combustion Systems using Laser Absorption Spectroscopy and Multi-Output Gaussian Process Regression. (Manuscript in preparation).
- **Saumya Vilas Roy***, Deepak Mishra & Rajesh Sadananan (2025). Combined FFT and Wavelet Analysis of Schlieren and Flame Luminosity Time-Series to Visualize Regions of Combustion Instability. (Accepted NAPC 2025).
- **Saumya Vilas Roy***, & Manoj BS. (2024). A Complex Network Analysis of the OPEC Crude Oil Trade Network. DOI: 10.36227/techrxiv.171169316.66809297/v2. (RAICS 2024).

PRESENTATIONS

- "Complex Valued U-Net for Segmentation of PolSAR Images", ISG-ISRS 2023.
- "Meta-Learning for Space Applications for Advancements in Space Technology", Hindi Technical Conference 2023, IIST organized by Indian Space Research Organization (ISRO).

REFERENCES

- Husain Kanchwala, Assistant Professor, Center for Automotive Research and Tribology, IIT Delhi
  Email: husaink@iitd.ac.in, Phone: +91-112-6548571.
- Deepak Mishra, Professor, Department of Avionics, Indian Institute of Space Science and Technology,
  Email: deepak.mishra@iist.ac.in, Phone: +91-471-2568583.

- Marcos M. Raimundo, Assistant Professor, Institute of Computing, University of Campinas, Email: mraimundo@ic.unicamp.br, Phone: +55-19-35210322.