Aakash Madhav Rao

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Education

Post-Graduate Diploma in Advanced Studies and Research — *2023 - Present*
Ashoka University. Sonipat, India. — *CGPA 3.67/4.00*
<u>Thesis:</u> Reasoning for model performance in detecting cellular structures in cancer histopathology
<u>Advisor:</u> Dr. Debayan Gupta

Bachelors of Science (Honours) in Computer Science — *2020 - 2023*
Ashoka University. Sonipat, India. — *CGPA 3.25/4.00*
Advisor: Prof. Debayan Gupta and Prof. Anirban Mondal (late)

High School Diploma — *2018 - 2020*
Ryan International School, Bengaluru, India. — *CGPA 90.4%*
Headed of the student council (President). Created and led one of the regions first TedED chapter.

Work

Graduate Research Assistant — *Jan 2023 - Jan 2024*
Trivedi School of Biosciences, Ashoka University. — *Sonipat India*
Investigated and developed deep learning algorithms for diagnosis and prognosis in oral cancer.

Summer Research Intern — *Jun 2023 - Sep 2023*
With Dr. Rintu Kutum, Ashoka University. — *Sonipat India*
Built and optimized a pipeline to harmonize large-scale in-house dataset of pathological images (H&E).

Winter Research Intern — *Dec 2022 - Jan 2023*
Centre for Healthcare Analytics and Research trends, Ashoka University. — *Sonipat India*
- Evaluated deep learning algorithms for TB cough sound data (Acoustic Machine Learning).
- Implemented Deep Spectral Segmentation for H&E pathological images of breast cancer.

Research Intern — *Aug 2022 - Dec 2022*
With Professor Subashis Banerjee, Ashoka University. — *Sonipat India*
Evaluated the effect of context of H&E images deep learning algorithm performance. Explored unsupervised learning of features at a patch level in H&E images.

Summer Research Intern — *Apr 2022 - Aug 2022*
Mphasis Labs for Machine Learning and Computational Thinking, Ashoka University. — *Sonipat India*
Reviewed and bench-marked deep learning based classification models to classify tumor, stroma, and tumor infiltrating lymphocytes (TILs) at a patch level in H&E histopathology images.

Publications and Posters

(*Pre-print*) **ORCHID: A Comprehensive Oral Cancer Histology Image Database for Histopathological Analytics and Diagnostics** (August, 2023)
Nisha Chaudhary, Arpita Rai, **Aakash Madhav Rao**, Md Imam Faizan, Jeyaseelan Augustine, Akhilanand Chaurasia, Deepika Mishra, Akhilesh Chandra, Varnit Chauhan, Rintu Kutum, Tanveer Ahmad
DOI: 10.1101/2023.08.14.23294094

(*Poster*) **Grade-level classification of oral squamous cell carcinoma (OSCC) from digital pathology using ensemble deep learning algorithms** (April, 2023)
Nisha Chaudhary, **Aakash Madhav Rao**, Md Imam Faizan, Arpita Rai, J. Augustine, Akhilanand Chaurasia, Deepika Mishra, Akhilesh Chandra, Rintu Kutum, Tanveer Ahmad
ISMB/ECCB 2023: The 31st Annual Intelligent Systems For Molecular Biology and the 22nd Annual European Conference on Computational Biology, Lyon. [Poster]

(*Poster*) **Histopathology Image Analysis using Automated Cell and White Space Classification: A Solution for Improved Digital Pathology** (March, 2023)
Aakash Madhav Rao, Pranit Sinha, Debayan Gupta, Rintu Kutum
The 1st Ashoka Science and Research Fair (**ASRF**) | Haryana, India

(*Paper*) **The Future of China's Minorities with the Growing Power and Breadth of Technology (April 14, 2022)** (April, 2022)
Aakash Madhav Rao
Journal of Social and Political Sciences, Asian Institute of Research
URL: https://www.asianinstituteofresearch.org/RaoFut2022

Teaching

CS1206 - TA for Design and Analysis of Algorithms *Jan 2024 - Present*
Department of Computer Science, Ashoka University. *Sonipat India*
Prof. Anirban Sen

Peer Tutor *Aug 2023 - Dec 2024*
Independently with the department of Physics and Computer Science, Ashoka University. *Sonipat India*

CSL2010 - TA for Introduction to Machine Learning *Jun 2023 - Sep 2023*
Indian Institute of Technology Jodhpur *Jodhpur, India*
Prof. Rintu Kutum, Prof. Sucharita Dey, and Prof. Pankaj Yadav

CS2378 - TA for The New Georaphy of the Information Age *Jan 2023 - May 2023*
Department of Computer Science, Ashoka University. *Sonipat India*
Prof. Debayan Gupta

CS1230 - TA for Data Structures I *Sep 2022 - Dec 2022*
Department of Computer Science, Ashoka University. *Sonipat India*
Prof. Soumyottam Chatterjee, Prof. Debayan Gupta

CS2378 - TA for The New Geography of the Information Age *Jan 2022 - May 2022*
Department of Computer Science, Ashoka University. *Sonipat India*
Prof. Debayan Gupta

Awards and Accomplishments

Student Travel Grant | *July 2023*
Ashoka University Centre for Supporting Students
Received a $1200 grant to travel for the the 31st annual Intelligent Systems For Molecular Biology and the 22nd Annual European Conference on Computational Biology ISMB/ECCB at Lyon, France.

Singapore International Pre-Graduate Award | *March 2023*
A-Star Laboratories and The Government of Singapore
Earned this award for an exceptional research profile at an undergraduate level.

All Round Best Student Award | *May 2020*
Ryan International School
Awarded for exceptional contribution to the school as well as exceptional academic record.

Leadership

President of the Computer Science Society
Ashoka University | Jun 2022 - Jun 2023
Advisor: Prof. Debayan Gupta and Prof. Manu Awasthi
Led a society of close to 50 undergraduate students. Planned, oversaw, and executed multiple community building and academic events. Strengthened the position of the society in the academic space.

Editorial Board for Healthcare x Computer Science
The Crossthink Journal | Jun 202 - Present
Advisors: Prof. Debayan Gupta and Prof. Partho Pratim Chakrabarti
Reviewed articles and works submitted to the journal. Suggested constructive changes to articles and evaluated arguments presented in the inter-sectional field of healthcare and computer science.

Volunteering

National Conclave: The Future of Disability Inclusion in Higher Education | *September 2023*
Office Of Learning Support | Ashoka University, Sonipat, India.
Assisted in logistical arrangements. Guided guests with visual impairment and other disabilities.

Peer Mentor | *Sep - Dec 2022*
Office Of Learning Support | Ashoka University, Sonipat, India.
Counseled and supported students with a diverse range of learning disabilities. Facilitated the better understanding of mathematics and computer science.

Key Skills

Languages: C, Python, Java, R
Libraries: PyTorch, Tensorflow, sklearn, scikit-image, OpenCV
Tools: Vim, Git, LaTeX, VSCode, Inkscape, Adobe, AutoCAD