Shashank Katiyar

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Education

Carnegie Mellon University — Pittsburgh, PA
Master of Science in Computational Biology — *June 2025*

Indian Institute of Technology Kanpur, India — Kanpur, India
Bachelor of Technology in BioSciences and Bioengineering — *June 2023*
GPA: 9.1/10 – Department Rank: 1

Experience

TenSixty BioSciences: Drug Discovery — Cambridge, MA (Remote)
Machine Learning Intern — *September 2022 – July 2023*

- Designed pipeline for Marker Gene Identification of rare cell types found in cancer, employing scRNA sequencing data and Scanpy Library, and discovered their prevalence in Cancers from TCGA
- Collaborated with Amazon Web Services officials to execute Kallisto sequencing tool on Amazon Web Services parallel, with Docker, for high throughput processing of raw FASTQ files at isoform level
- Identified a differentially expressed isoform for small cell lung cancer for specific cancer drug targeting
- Designed a protein binder for identified isoform with RFdiffusion with Alignment Error of 10
- Developed 3D visualization tool for regions inside and outside cell membrane of transmembrane proteins

Projects

Understanding Gene Networks: Toggle Polygons — Kanpur, India
Mentor: Prof. Mohit Jolly, IISc Bangalore — *March 2022 – July 2022*

- Executed toggle polygons, a type of gene network motifs, employing computational tool RACIPE
- Automated RACIPE to get a large dataset of toggle polygon variants for training an ML model
- Implemented neural network to predict frequency of states and got maximum testing accuracy of 95%

Tissue Clustering in Spatial Transcriptomics data — Kanpur, India
Mentor: Prof. Hamim Zafar, IIT Kanpur — *January 2022 – March 2022*

- Performed dimension reduction on Visium Spatial Expression Data with Autoencoder from scvi-tools
- Developed a neural network to perform spot-clustering in unknown tissue of same type (mouse brain) using latent dimensions from autoencoder and obtained ARI of 0.7

Inferring Evolution of Oral Cancer in Patients — Kanpur, India
Mentor: Prof. Hamim Zafar, IIT Kanpur — *July 2022 – October 2022*

- Extracted Oral Cancer WGS data from ICGC and processed it to obtain point mutations in VCF format and Copy Number Variations with Mutect2 and ABSOLUTE tools respectively
- Inferred Phylogeny of Intra-Tumor Heterogeneity for better Oral Cancer Characterization

Slithbot: Slither playing AI — Pittsburgh, PA
Ongoing Self Project — *August 2023 – Present*

- Implemented object detection (snake) in online multiplayer game Slither.io with OpenCV
- Optimizing a Reinforcement Learning AI to play Slither by itself, to reach top of Leaderboard

Skills

Programming: C/C++, Python, Go, Shell Scripting, R

Toolkit: Docker, AWS Parallel, Tensorflow, Pytorch, RFDiffusion, Git/Github, OpenCV, ABSOLUTE, NGS, GATK- Mutect2, PyMOL, Scanpy, MUSCLE, Bedtools, Kallisto, SCVI-tools, Visium, Microsoft Office

Awards

- Excellence in Education Medal for best academic performance in Biological Sciences department
- Academic Excellence Award for being in top 10% of batch for 2 consecutive years: 2021-22 and 2022-23

Leadership

Autonomous Underwater Vehicle, IIT Kanpur | *Team Head* — Dec 2019 – May 2022

- Led and guided a team of 25 individuals into developing an Autonomous Underwater Vehicle
- Won 3rd, 4th, 8th and 16th positions in Intl. AUV competition Robosub'21, among 53 teams worldwide