Varenya Jain

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Education

University of Illinois Urbana-Champaign — Champaign, IL
Bachelor of Science in Integrative Biology, Minor in Electrical Engineering — *December 2024*

Experience

Bioinformatics Student Researcher | **Metabolomics & Proteomics Core Facilities** — June 2023 – Aug. 2023
Roy J. Carver Biotechnology Center — *Urbana, IL*

- Develop Untargeted Metabolomics Pipeline for post-processing and Quality Control assessment
- Analyze and interpret experimental results before disseminating scientific data to end users
- Perform Untargeted LC-MS analysis and Targeted analyses on unknown metabolite samples

SPIN Research Intern | **The NEAT Project v4.0** — Aug. 2021 – Sep. 2022
National Center for Supercomputing Applications — *Champaign, IL*

- Design NGS toolkit for HAL Cluster: Increase Parallel Processing speed by 7% , Streamline Empirical Mutation and Sequencing Models, Revise bash scripts and input flags
- Manage genomic pipeline (FASTA, FASTQ, SAM, BAM, VCF) and implement relevant Bioinformatics algorithms: Smith–Waterman, BLAST, Localized String Alignment
- Present HPC Genomics Group findings at NCSA Exhibition and REU FoDOMMaT/SPIN Showcase

IoT Research Lab Assistant | **Caesar Lab** — Jan. 2021 – Jun. 2021
Coordinated Science Laboratory — *Urbana, IL*

- Remodel a Reinforcement Learning System intended for UAV-Assisted Emergency Response
- Upgrade fully-distributed communication environment for USAF usage
- Implement communication trees via Python Message Passing Interface (MPI) standard in under 6 months

Research Intern | **Drs. Spitalnik, Hod** | **La Carpia** — June 2018 - Aug 2018
NewYork-Presbyterian Columbia University Irving Medical Center - Lab of Transfusion Biology — *New York, NY*

- Investigate the effects of transfusional iron overload on gut microbiota due to intravenous infusion Assist in conducting initial studies on a mouse model with a treatment of intravenous infusion of iron dextran and RBC transfusion to retrieve data on iron-deficient erythropoiesis similar to the red blood cell recovery of blood donors after Hematopoietic Stem Cell Transplantation.
- Assist in sample analysis for a chromium-51-labeled Posttransfusion Recovery Study focused on assessing RBC quality.
- Utilize basic Spearman Correlation meta-analysis of bacteria communities, perform blood analysis tests, and use Flow Cytometry to collect sample cell data

Projects and Involvement

AM Radio | *ECE 210* — Jan. 2022 – May 2022

- Construct a functioning AM Radio using a Superheterodyne Receiver; Convert digital .wav audio input to analog 3.5mm speaker output
- Utilize Fourier Transforms to convert Time domain signals to Frequency domain responses

Virtual Gloves | ***ECE 120 Honors*** — Jan. 2021 – May 2021

- Develop a "virtual keyboard" by moving fingers attached to flex sensors and provide haptic feedback
- Collect data from flex resistors in Arduino Studio and use C++ to send output confirmations to LEDs

Leadership: 2024 NCSA Student Research Conference Industry Lead, 2023 NCSA Student Research Conference Organizer, IEEE Region 4 2023 SLC Conference Planning Lead, PULSE 2022 Outreach Committee Lead
Membership: IEEE Region 4, IEEE@UIUC, iRobotics, MRDC, Vex Robotics, ACM, SIGPWNY

Technical Skills

Lab Skills: Eppendorf pipetting, RT-qPCR, Flow cytometry, Clinical centrifugation, Mass spectrometry, Rodent tissue collection
Bioinformatics Software: SAMtools, UGENE, BLAST+, Biopython, Chromosome Analysis Suite (ChAS)
Developer Tools: Docker, VirtualBox, Google Cloud (SDK, Analytics, BigQuery), Digital Ocean Droplets
Programming Experience: Bash, C/C++, CUDA, Python MPI, SciPy, Rstudio Bioconductor, MatLab, Octave
Electrical Engineering: Pi (Zero/3b/4), Arduino, Oscilloscope, Network Analyzer, MAX 10 FPGA, Quartus Prime, ModelSim, SystemVerilog, Analog Signal Processing (Fourier transforms, RLC Circuits, Operational Amplifiers, Band-Pass Filters Nyquist sampling, Convolutional neural networks)