Shreyasvi Natraj

✉ **Email address:** shreyasvi.natraj@unige.ch 🌐 **Website:** nshreyasvi.github.io

WORK EXPERIENCE

ETH Zürich
Scientific Assistant [15/06/2023 – 29/02/2024]

- Carried out on primer design, cloning and transformation of bacterial competent cells for purifying SUMO protein variants.
- Performed In-vitro ubiquitination assays to assess the nuclear transport of SUMO proteins and their role rDNA repair.
- Implemented pipelines for differential expression and alternative splicing analysis for ZNF451 isoform RNA-Seq data.

(**Supervisors:** *Andrea Pichler*, *Matthias Peter*)
RNA-Seq, SnapGene, Wet-Lab, Image Processing, High Performance Computing

National Centre for Competence in Research Synapsy
Graduate Student Researcher/ Research Assistant [01/02/2019 – 31/01/2023]

- Carried out 3D localization and pose estimation using photogrammetry and point cloud analysis.
- Developed gaze, audio & video neural network classifiers for screening of autism spectrum disorder.
- Developed deep learning and machine learning tools for digital phenotyping of autism spectrum disorder.
- Contributing to writing several research articles and research grants (Swiss National Foundation Sinergia grant).

(**Supervisors:** *Marie Schaer*, *Thomas Maillart*)
Slurm, Seaborn, PyTorch, Scipy, Keras/TensorFlow, OpenCV, Pandas, R-Caret, Streamlit

CERN
Technical Student [01/07/2021 – 30/06/2022]

- Used terraform & ansible for EOSC Testsuite for high energy physics, deep learning and high-performance computing workload benchmarking on several Cloud computing providers
- Developed a Openshift based web interface/dashboard for results visualization and analysis.
- Conducted FAIR testing and developed several kubernetes-based tools for the Archiver project.
- TestSuite awarded best demo at EGI Conference 2021, Archiver Awarded by the Digital Preservation Coalition.

(**Supervisors:** *Joao Fernandes*, *Bob Jones*)
Terraform, Ansible, kubernetes, docker, slurm, GCP, Azure, AWS, IBM Cloud, Tensorflow/Keras, PyTorch

CERN
Openlab Summer Student [04/06/2018 – 31/08/2018]

- Developed automated damage analysis extraction tool for stereo image pair & shuttle radar topography-based digital elevation models and structure point data for Aleppo, Syria & Herat, Afghanistan.
- Developed mechanical turk web instances for refugee camp polygon data generation. (Talk)
- Implemented event tracker for social media-based disaster data collection tool called E2MC
- Carried out ionized gas simulations using Garfield++ to determine ionization/excitation rates, gain curves and penning effect transfer probabilities.(Github Repo)

(**Supervisors:** *Lars Bromley*, *Francois Grey*, *Sofia Vallecorsa*)
Pandas, OpenCV, AWS M-Turk, GCP, HTML, CSS, JS, QGIS, Pybossa, DBSCAN, KNN, Garfield++, Root

University of Geneva -Tsinghua University Initiative
Summer Student [03/07/2017 – 26/08/2017]

- Implemented multiple CNN models for object detection and trash classification in an automated trash sorting system.
- Successfully generated annotated dataset from crude data using crowdsourced Zooniverse campaign
- Launched Alcrowd challenge to create a text detection neural network-based portable low-cost scanner for automated digitalization of UNOG Archive Data. (Press Release)
- Contributed to making SPI for FPGA-RPi communication (cosmic pi).

(**Supervisor:** *Francois Grey*, *Colin Wells*)
OpenCV, TensorFlow, GCP, Microsoft Azure Services, Xilinx Vivado/VHDL, Raspberry Pi, Lattice ICE40HX8

Graviky Labs (MIT Media Labs Offshoot)
Summer Research Intern [01/05/2016 – 30/06/2016]

- Developed an electrostatic system for a device called Kaalink to convert PM2.5 into Air-Ink
- The project was showcased in a documentary at the Cannes Film Festival.

(**Supervisors**: *Anirudh Sharma*, *Nikhil Kaushik*)
Solidworks (3D Modeling & Simulation), Manufacturing/assembly, Dry Lab Skills, Ansys

PUBLICATIONS

Using 2D Video-based Pose Estimation for Automated Prediction of Autism Spectrum Disorders in Preschoolers

S. Natraj*, N. Kojovic*, S.P. Mohanty, T. Maillart & M. Schaer, Scientific Reports 11 (* first co-authorship) - 23/07/2021

COVID-19 Activity Risk Calculator as a Gamified Public Health Intervention Tool

S. Natraj, M. Bhide, N. Yap, M. Liu, A. Seth, C. Glorioso, Scientific Reports 13 - 11/08/2022

Video-Audio Neural Network Ensemble For Comprehensive Screening Of Autism Spectrum Disorder in Young Children

S. Natraj, N. Kojovic, T. Maillart & M. Schaer, Scientific Reports (Under Revision) - 05/06/2023

Gesture imitation performance and visual exploration in young children with autism spectrum disorder

K. Latrèche, N. Kojovic, I. Pittet, S. Natraj, M. Franchini, I. M. Smith, M. Schaer, BMC journal of neurodevelopmental disorders (Under Review) - 03/04/2023

EDUCATION AND TRAINING

University of Geneva
Master of Science (Neuroscience) [08/09/2019 – 01/08/2022]

Final grade: 5.56/6

R.V. College Of Engineering
Bachelor of Engineering (Biotechnology) [01/05/2015 – 30/05/2019]

Final grade: 8.55/10

VOLUNTEERING PROJECTS, SKILLSET & ACHIEVEMENTS

Selected Projects

• **NeuralWorks**: Working on a startup project called NeuralWorks based on developing Brain-machine interfaces.

• **Brain fMRI Data Analysis Platform**: Worked on developing PACS and fMRI data analysis platform using XNAT, DCM4CHEE and AWS Cloud during a summer internship at FCBG (Campus Biotech) under Dr. Michael Dayan.

• **Abbie (AR/VR Sensor Based roBot for Intuitive Exploration):** Used Google project tango's area learning and raspberry pi to build an autonomous pod-like vehicle. *(KPIT Sparkle 2017 National top 15 finalist).*

• **Casie (Context Acquired detail Sensing in Indoor/outdoor Environment):** A deep-learning model to compare results from machine learning models for emotion recognition using voice and image. *(Microsoft imagine cup EMEA region top 10 projects)*

• **LVPEI MITRA Engineering the Eye Workshop 2016:** Worked on developing BullsEye, a smartphone attachment to determine corneal topography during an MIT Media Lab Workshop in LVPEI. *(Awarded Certificate of team excellence)*

• **SRISTI-UNICEF Summer School 2017:** Developed a low-cost toxic gas detector for the prevention of casualties of salt farmers due to poisonous gas leakages in Rann Of Kutch region in Gujarat.

Skillset

1. Python,
2. R,
3. C++,
4. Microcontroller/ARM programming,
5. Wet Lab Skills (Cloning, Transformation, Purification)

Selected Achievements

• Startup NeuralWorks awarded Talentkick 2022 and Blaze Accelerator 2022 grants.
• Selected among top 10 startups for Venturelab's AIT 2020 Program,
• HackZurich 2020 and 2023 Sponsor Challenge Winner and PennApps 2023 Best Use of Statistics Hack Winner,
• Microsoft Imagine Cup 2020 EMEA Top 10 Projects,
• SRISTI UNICEF 2015 Award Winner,
• Awarded Best Outgoing Student at R.V. College of Engineering, Class of 2019,
• National Entrepreneurship Challenge 2015/16 Winner