

# AAYUSH GROVER

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## OBJECTIVE

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Incoming doctoral student at [Boeva Lab](#) (ETH Zurich). My interest lies in use of Artificial Intelligence and Machine Learning in Biomedicine.

## EDUCATION

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**Integrated Masters in Computer Science Engineering/Data Science** August 2016 - July 2021  
International Institute of Information Technology, Bangalore, India  
CGPA: 3.79/4.00 = 9.475/10.00

## PUBLICATIONS

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**MHCAttnNet: Predicting MHC-Peptide Bindings for MHC Alleles Classes I & II Using An Attention-Based Deep Neural Model**

International Institute of Information Technology Bangalore August 2019 - July 2020  
Supervisors: [Prof. Shrisha Rao](#) & [Prof. G. Srinivasaraghavan](#)

- Built an end-to-end system to compute the binding affinity between a given peptide and a particular MHC allele. We not only predict more accurately but also use an attention based scheme to analyze the subsequences of amino acids that are more important to make a particular prediction. This work was presented in [ISMB-2020](#) and is published in [OUP Bioinformatics](#) (doi:10.1093/bioinformatics/btaa479).

## RESEARCH EXPERIENCE

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**Cancer Survival Prediction using Multi-omics Integration: A Few-Shot Learning Approach**

Master Thesis, IIIT-Bangalore September 2020 - June 2021  
Supervisors: [Prof. G. Srinivasaraghavan](#) & [Prof. Laurent Gatto](#)

- Built a few-shot learning model for predicting survival in cancer patients. As the existing cancer patient data have very limited datapoints of each cancer type, training deep neural networks is not feasible. Therefore, we built the first few-shot learning model for this task that can be used to predict survival in patients suffering from any cancer type.

**Protein Subcellular Localization Prediction**

Computational Biology and Bioinformatics Group, UCLouvain May 2020 - June 2021  
Supervisor: [Prof. Laurent Gatto](#)

- Built a deep learning model for predicting protein subcellular localization using protein-protein interaction networks. Experimentally determining the localization of a protein can be challenging when a related antibody is unknown. Therefore, a multi-label predictive model that can annotate new proteins accurately is needed.

**Novel Deep Learning Assisted Virtual Screening to Enhance Drug Discovery for COVID-19**

IIIT-Bangalore & NCBS, Bangalore May 2020 - March 2021  
Supervisors: [Prof. G. Srinivasaraghavan](#), [Prof. R. Sowdhamini](#) & [Prof. Neelam Sinha](#)

- Built an attention-based graph neural model for ranking the molecules from SuperNatural and Drugbank databases on the basis of their docking with the NSP-1 protein of SARS-CoV-2. The experimental dataset consists of molecular fingerprints of drug molecules. The top ranked molecules are validated experimentally. This work will soon be submitted to [MDPI's Molecules](#).

## NOTABLE PROJECTS

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### Face Generation and Style Transfer

Course: Visual Recognition

January 2019 - May 2019

Instructor: [Prof. Dinesh Babu Jayagopi](#)

- Built a Deep Convolutional GAN model to generate new faces using the Autocrop tool for pre-processing. We built an auto-encoder model for training encoders and decoders to detect a particular person's facial features. Using encoder of one person's image and decoder of another person's image, we were able to reasonably produce style transfers between people.

### Text Style Transfer

Course: Natural Language Processing

January 2020 - May 2020

Instructor: [Prof. G. Srinivasaraghavan](#)

- Built an end-to-end model that can change the sentiment of a given sentence while retaining the context of the sentence. We tried two approaches – first comprises of BERT as encoder and GPT-2 as decoder whereas the other uses a sequence-to-sequence model.

## WORK EXPERIENCE

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### Teaching Assistant

Introduction to Automata Theory and Computing

August 2020 - December 2020

Instructor: [Prof. Shrisha Rao](#)

### Teaching Assistant

Design and Analysis of Algorithms

January 2020 - May 2020

Instructors: [Prof. Meenakshi D'Souza](#) & [Dr. Pradeesha Ashok](#)

## SKILLS

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### Programming Languages

Python, C++, Java, MySQL, C, Ocaml, Prolog

### Tools

Jupyter, LaTeX, NetLogo

### Python Libraries

Pytorch, Pandas, Numpy, Scipy, Scikit-learn, OpenCV, Matplotlib, Goatools, Seaborn, Torchtext, Torchvision, Biopython

## SERVICE TO FIELD

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- Member of the [ISCB-Student Council](#) 2020-Present
- Reviewer of [Springer's Sadhana Journal](#) 2019-Present
- Reviewer of [International Conference on Autonomous Agents and Multi-Agent Systems \(AAMAS\)](#) 2019

## AWARDS

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- Awarded the [Swiss Government Excellence Scholarship](#) for doctorate at ETH Zurich 2021
- Awarded the [DAAD WISE](#) scholarship for summer internship in Germany 2019
- Dean's Merit List, International Institute of Information Technology, Bangalore 2016-2021
- Awarded All Rounder and Mathematics Topper, Rajhans Vidyalaya, Mumbai 2016

## EXTRA-CURRICULAR ACTIVITIES

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- Member of AI Club at IIIT-B 2018-2021
- Head of College Sports Committee 2018/19
- Captain of College Football Team 2018/19 & 2019/20
- Head Organizer of the [RMIT Conference](#) 2017-2019