

# AAYUSH GROVER

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## OBJECTIVE

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I am a 4th year engineering student who is currently pursuing an Integrated Masters Degree in Computer Science Engineering/Data Science. My interest lies in use of Artificial Intelligence and Machine Learning in Molecular Biology.

## EDUCATION

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**Integrated Masters in Computer Science Engineering/Data Science** August 2016 - June 2021  
International Institute of Information Technology, Bangalore, India  
CGPA: 3.77/4.00 = 9.425/10.00 (At the end of 7 semesters)

## WORK EXPERIENCE

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**Teaching Assistant**  
**Design and Analysis of Algorithm** January 2020 - May 2020  
Instructors: [Prof. Meenakshi D'Souza](#) & [Dr. Pradeesha Ashok](#)

## RESEARCH EXPERIENCE

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**Protein Subcellular Localization Prediction**  
**Computational Biology and Bioinformatics Group, UCLouvain** May 2020 - Present  
Supervisor: [Dr. Laurent Gatto](#)

- Working towards building a deep learning model for predicting protein subcellular localization using protein-protein interaction networks. Experimentally determining the localization of a protein can be a very cumbersome task. Therefore, a predictive model that can not only predict with high accuracy but also explain the results to some extent is needed.

**Drug Discovery – Identifying Drugs that can have Therapeutic Effects against SARS-CoV-2**  
**IIIT-Bangalore & NCBS, Bangalore** May 2020 - Present  
Supervisors: [Prof. G. Srinivasaraghavan](#), [Prof. R. Sowdhamini](#) & [Prof. Neelam Sinha](#)

- Building an attention-based graph neural model for ranking the molecules from [Broad's Drug Repurposing Hub](#) on the basis of their therapeutic behavior with SARS-CoV-2. The experimental dataset consists of molecular fingerprints of FDA approved drug molecules. The top ranked molecules from the Drug Repurposing Hub will be tested experimentally to validate our results.

**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 is accepted in the proceedings of [ISMB-2020](#) and will be published in [OUP Bioinformatics](#).

**Modifying and Integrating SMAC Hyper-parameter Optimizer Algorithm for PHOTON AI**  
**Artificial Intelligence in Psychiatry Group, University of Münster** May 2019 - July 2019  
Supervisor: [Prof. Dr. Tim Hahn](#)

- Worked towards integrating **SMAC** hyper-parameter optimizer to the [PHOTON AI](#) library. PHOTON is a platform-independent, rapid prototyping framework. SMAC was the first hyper-parameter optimizer that used Bayesian optimization and handled conditioning of hyper-parameters.

## NOTABLE PROJECTS

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### Text Style Transfer

Course: Natural Language Processing

January 2020 - Present

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

- Building 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.

### 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.

## COURSES COVERED

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**Data Science:** Machine Learning, Artificial Intelligence, Bayesian Methods and Probabilistic Graphical Models, Natural Language Processing, Visual Recognition I & II, Reinforcement Learning, Multi-Agent Systems, Privacy-Preserving Machine Learning, Math for Machine Learning

**Computer Science:** Theory of Computation, Database Management Systems, Operating Systems, Software Engineering, Programming Languages, Graph Theory, Data Structures, Analysis of Algorithms, Discrete Math

**Math and Basic Sciences:** Calculus, Linear Algebra, Probability, Statistics, Complex Analysis, Physics, Chemistry, Biochemistry

**Social Sciences:** Privacy in Digital Age, Economics, English, Ethics

## SKILLS

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### Programming Languages

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

### Tools

Jupyter, LaTeX, NetLogo, HTML, CSS, Raspberry Pi

### Python Libraries

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

## SERVICE TO FIELD

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

## AWARDS

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- Awarded [DAAD WISE](#) Scholarship for summer internship in Germany 2019
- Dean's Merit List, International Institute of Information Technology, Bangalore 2016-Present
- Awarded All Rounder and Mathematics Topper, Rajhans Vidyalaya, Mumbai 2016

## EXTRA-CURRICULAR ACTIVITIES

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