# Harish Rajagopal

Fourth Year Undergraduate
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## Educational Qualifications

| Degree | Year | Institution/Board | CGPA/% |
|---|---|---|---|
| B. Tech | 2016 - Present | IIT Kanpur | 9.7/10.0 |
| Sr. Secondary | 2016 | Maharashtra HSC | 90.46% |
| Secondary | 2014 | Maharashtra SSC | 93.6% |

## Academic Achievements

- Awarded **Academic Achievement Awards** for outstanding performance in 1st and 2nd years.
- Secured All India Rank of **185** in **JEE Advanced 2016**.
- Secured All India Rank of **205** in **JEE Mains 2016**.

## Internships

- **Research Intern, NYU Tandon**
  *May '19 - July '19*
  - Researched robust image hashes that are immune to typical image transformations, while being sensitive to malicious image edits such as face swaps & deep fakes.
  - Developed a *framework* for testing against compression, contrast changes, gamma, blurring, warping.
  - Tested the networks against *adversarial attacks* such as *FGSM*, *Projected Gradient Descent*, *Boundary Attack*.

- **Research Intern (Remote), NYU Tandon**
  *May '18 - July '18*
  - Researched *differentiable plasticity* for *domain transfer* in images using Convolutional Neural Networks.
  - Improved *efficiency* in the temporal update rule for the *Hebbian weights* by using *transpose convolution*.
  - Achieved improvement in classification accuracy, when adapting models from the SVHN dataset to MNIST.

- **Intern, Machine Learning Team, New York Office of IIT Kanpur**
  *May '17 - July '18*
  - Developed an *online* text clustering model using a fully-online modification of the *DBSCAN* algorithm.
  - Implemented an *online* document vectorisation model using *Distributed Memory paragraph vectors*.
  - Deployed above models using Docker and integrated with existing infrastructure using Apache Kafka.
  - Developed a *Word2Vec* model to identify duplicate documents using *Word Mover's Distance* on word vectors.
  - Trained a CNN with sliding windows for English OCR.

## Projects

- **Compiler for Golang in Python**
  *Jan '19 - Apr '19*
  - Implemented basic C-like features like data types, functions, pointers, structs, library imports, and I/O.
  - Implemented advanced features like composite literals, struct embeddings, typedefs/aliases, operator overloading, multiple value returns, and short declarations.
- **GemOS - Operating Systems Development**
  *Aug '18 - Nov '18*
  - Developed an object-store FUSE filesystem.
  - Implemented process scheduling, sleeping, signal handling, syscalls and exception handlers.
  - Implemented virtual memory and paging.
- **No-Frills Cab Locator - Android App**
  *Sept '18 - Nov '18*
  - A one-button-touch cab service with apps created using the *Ionic framework* for Android as part of a course.
  - Developed separate customer and driver apps using *Angular2* in Typescript and *Sass* for styling.
- **Improving GANs through Test-Time Constraints**
  *Jan '19 - Present*
- **Multi-Agent GANs for Image Super-Resolution**
  *Aug '18 - Dec '18*
- **Higher-Order Optimisation in Deep Learning**
  *Sept '18 - Nov '18*
- **7th Inter-IIT Tech Meet (Silver Medal)**
  *Dec '18*
- **6th Inter-IIT Tech Meet**
  *Dec '17 - Jan '18*
- **Depression Therapy Chatbot**
  *May '17 - July '17*

## Technical Skills

- **Programming Languages:** Python, Bash, C, C++, LaTeX, PHP, HTML+CSS, MySQL, Typescript
- **Software and Utilities:** TensorFlow, PyTorch, Keras, Numpy, Git, OpenCV, Hyperopt, Gensim, Ionic

## Relevant Courses

| | | |
|---|---|---|
| Compiler Design (A⋆) | Algorithms II | Operating Systems |
| Visual Recognition | Introduction to Machine Learning | Data Structures and Algorithms |
| Probability and Statistics | Discrete Mathematics | Fundamentals of Computing (A⋆) |