

Sai Praveen B

Applying for *M.S. in Computer Science, Fall 2017*

4003, Saraswathi Hostel, IIT
Madras, Chennai - 600036

M :- +91 8220009881

saipraveenb25@gmail.com



About Me

I have developed general software applications since 10th grade and eventually, by junior year, moved to more research oriented fields.

My work is primarily in *Computer Graphics* and *Reinforcement Learning*.

For more, please visit: www.cse.iitm.ac.in/~bpraveen

Academic Statistics

KVPY (Scientific Research Scholarship) SX Scholar 2013,

97.4% 12th Grade AISSCE 2013,

All India Rank 10 out of **1,300,000** students in JEE-Mains 2013,

All India Rank 211 out of **150,000** (qualified) students in JEE-Advanced 2013,

9.34 CGPA & Branch Rank 3 after 6 semesters at IIT-M,

Charpak Research Scholarship 2016,

332 (Verbal-162, Quantitative-170) in GRE,

112 (Reading-30, Writing-28, Listening-30, Speaking-24) in TOEFL

Internships

Research Intern, GraphDeco, INRIA Sophia-Antipolis — May - Jul 2016

Worked as a research intern under the supervision of Prof. George Drettakis.

Extended the *Mitsuba* open-source renderer to compute more complex quantities required to generate intermediate ground truth quantities for the Multi View Intrinsic Image Re-lighting (MVIR) algorithm.

Also developed efficient algorithms to align reconstructions with their originals for use in error computation.

Tech Lead, Clozerr – May 2014 - Dec 2015

Clozerr is a Chennai-based startup that is angel-funded focusing on Tech-enhanced Intelligent Customer Retention. Led a team of 7 employees (from IITM) to systematically write the entire technical side (tools, server-tech, heuristics etc).

Software Intern, HyperVerge – May - Jul 2014

HyperVerge is a Silicon-Valley based startup focusing on Computer Vision & Deep Neural Networks. Worked with them during their critical phase when they raised 700,000\$.

Education

Maharishi International Residential School – 12th Grade, 2013

Indian Institute of Technology Madras - Bachelor's in Computer Science, 2013 - 2017

Papers

Exploration for Multi-task Reinforcement Learning with Deep Generative Models,
[Sai Praveen B et al.]

NIPS Deep Reinforcement Learning Workshop 2016, Barcelona

Sep - Nov 2016

<https://arxiv.org/abs/1611.09894>

Started as a research project for the graduate course CS6700 (Reinforcement Learning). Tackles the problem of Multi-task Reinforcement Learning by learning a generative model over all the possible MDPs using an RBM.

Continued the project in the graduate course CS7011 (Topics in Reinforcement Learning) and extended it by introducing an adaptation of Variational Auto-encoders instead of RBMs as the MDP model. Proposed a novel method of identifying important states using the Jacobian of the Auto-encoder.

Projects

OpenGL Graphics Engine – Dec 2014 - Jan 2015

<https://github.com/SaipraveenB/opengl-hdr>

Created a low-level OpenGL-based graphics engine implementing some modern graphics algorithms that are missing from most open-source graphics engines.

It has been written using only native C++ and OpenGL libraries and features the standard set of graphics algorithms along with HDR rendering, Tessellation and Dispersion.

NURBS curve designer – April 2015

<https://github.com/SaipraveenB/nurbs-designer>

Submitted as a semester project for Advanced Programming Lab, this 3D mesh deformation tool uses the C++ Graphics engine described above as a visualization library and a Java based equation solver for implementing the NURBS equation (a popular choice for graphic designers due to the nice properties it offers).

OpenGL/OpenCL GPU-accelerated Path tracer – May - Jul 2015

<https://github.com/SaipraveenB/opengl-path-tracer>

Coded from scratch, since OpenGL is a *rasteriser* based engine. OpenCL (open-source alternative to CUDA) was used to give OpenGL the functionality of a *ray-tracer* based engine which is commonly used to render movie graphics.

The goal behind this project was to attempt real-time graphics using path tracing which would yield extremely realistic lighting effects. It implements both the standard eye-to-light path tracing & Bi-Directional Path Tracing (BDPT) algorithms.

Natural Language Generation with Custom LSTMs – Oct - Nov 2016

<https://github.com/SaipraveenB/nlg-rom-lstm>

Led a team of 4 in exploring the use of LSTMs in learning to generate natural language snippets from raw data *end-to-end*. Instead of using two separate statistical methods to learn the two classical NLG stages (*content determination* and *sentence planning*), the project proposes the *Running Input LSTM* model to learn both the stages together. Took it a step further by designing an LSTM network that can *copy & paste* words from the *input* which allows much better generalisation on the Prodigy-METEO dataset.

Relevant Skills

Conceptual:

Computer Graphics.

(Projects #1-3 & Internship #1)

Machine Learning.

(Coursework: CS5011, CS6700, CS7011)

Probability

(Coursework: CS2140, MA2040)

Cryptography.

(Coursework: CS6500)

Programming Languages:

Proficient in: C/C++, Java, Python, JavaScript, x86 Assembly & GLSL

Have Coded in: Verilog (HDL), Haskell, Prolog & HLSL