Amit **Yadav**

Software Engineer

Samsung Research Institute · Bangalore

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Education

Indian Institute of Technology Kanpur — *Kanpur, India*

B.Tech in Computer Science and Engineering, CGPA: 7.6 — *2016 - 2020*

Aalto University — *Espoo, Finland*

Exchange Student, CGPA: 9.7 — *Jan - May 2020*

RPS Senior Secondary School — *Mohindergarh, Haryana*

Class XII — *2016*

Honors & Awards

2016	**All India Rank 429**, Joint entrance Exam Mains, 1.5 million candidates	*India*
2016	**All India Rank 497**, Joint Entrance Exam Advanced, 200,000 candidates	*India*
2016	**KVPY Fellowship Awardee**, Indian Institute of Science and Government of India	*Bangalore, India*
2016	**All India Rank 36**, National Entrance Scholarship Test, NISER Bhubaneswar	*Bhubaneswar, India*
2014	**NTSE Scholarship Awardee**, Government of India	*India*
2018	**Microsoft AI challenge**, Reached final round	*India*

Work Experience

Samsung Research Institute Bangalore — *Bangalore*

Software Engineer — *Jan. 2021 – Present*

- Working on a research project related to speeding up neural network training and inference using hardware optimizations.
- Includes building and maintaining a low-level library/API for the new hardware component.
- Built user friendly tools for layer-wise profiling and gradient statistics visualization for pytorch based models.

Samsung Research Institute Bangalore — *Bangalore*

Student Trainee — *May – July 2019*

- Evaluated various top-down and bottom-up human pose estimation algorithms using PCP and PCK metrics.
- Identified common case resulting in erroneous estimations and suggested methods to improve accuracy.
- Received a pre-placement offer for a software engineer role at the end of the internship.

Cyberphysical Systems Lab, IIT Kanpur — *IIT Kanpur*

Research Internship under Prof. Indranil Saha — *May – Dec. 2018*

- Designed a reinforcement learning based algorithm using an actor-critic method to synthesize a controller for quadrotor.
- Used imitation learning to initialize model parameters, resulting in significant reduction in policy search time.
- Used PX4 autopilot to collect flight data and Gazebo for simulation purposes.

Kritsnam Technologies — *IIT Kanpur*

Internship project: Remote Shell Access Service — *Dec. 2017 – Jan. 2018*

- Built a secure shell access service for remotely located unattended IoT devices.
- Used Autossh to set up a reverse SSH tunnel as soon as the device receives power or regains network connection.
- Scope : Service can be used as a free alternative to existing paid services like ngrok to manage any number of embedded devices.

Projects

Reinforcement Learning for Temporal Logic Goal — *IIT Kanpur*

Course Project Under Prof. Indranil Saha — *Jan. – April 2019*

- Explored reward engineering methods for reinforcement learning algorithms using temporal logic constraints.
- Learnt about STL, TLTL, robustness degree of STL and TLTL, τ—MDP, horizon length etc. **[Report][Slides]**

Golang Compiler

IIT Kanpur

Course Project Under Prof. Amey Karkare — *Jan. – April 2019*

- Wrote a compiler for translating Golang to MIPS32 using python as an implementation language.
- Used ply and yacc to produce the parse tree and SPIM for generating the binary from assembly code.

GemOS

IIT Kanpur

Course Project under Prof. Debadatta Mishra — *Aug. – Dec. 2018*

- Worked on an educational operating system, GemOS, as a part of the Operating Systems course.
- Implemented memory virtualization, system calls and task scheduling using **C++**.

Automated Image Captioning

IIT Kanpur

Course Project under Prof. Piyush Rai — *Sept. – Dec. 2018*

- Implemented a visual system using pytorch to generate contextual descriptions about objects in images.
- Used CNN based encoder (fine-tuned ResNet) for feature extraction and RNN decoder (GRU) to generates captions.

Autonomous Atari game player

Self-Project — *July 2018*

- Implemented Deep Deterministic Policy Gradient (DDPG) algorithm to train an Atari game player.
- Used OpenAI's GYM environment with tensorflow as backend.
- Trained multiple classical-control based games like Pendulum, Mountain Car, Ping Pong etc.

Solar Intensity Follower

IIT Kanpur

Robotics Club — *Dec. 2016*

- Built a device to turn solar panels in the direction of maximum sunlight using LDR sensors and Arduino UNO.
- Adjudged as one of the best projects, while being a freshman.

Skills

Programming Python, C/C++, Matlab/Octave, SQL, Oz

Libraries Tensorflow, Pytorch, Keras, NLTK, Scikit-Learn

Utilities Linux Shell Utilities, Git, Docker, GDB, Android Studio, LaTeX

Relevant Coursework

Programming Parallel Computers
Reinforcement Learning*
Operating Systems
Computational Complexity Theory
Formal Methods and Robotic Automation
Databases
Visual Recognition
Compiler Design
Software Engineering

*online course by Prof. David Silver

Extracurricular Activity

Leader

IIT Kanpur

Ultimate (Frisbee) Hobby Group — *April 2019 - July 2020*

- Led a group of 60+ students to conduct regular workshops and organize tournaments inside the institute.
- Responsible for promoting the game in and around the campus.

Project Mentor

IIT Kanpur

Assoication of Computing Activities — *Feb. – April. 2019*

- Mentored 10 freshmen for a semester long project on Reinforcement Learning under Association of Computing Activities, IITK.

Senior Executive

IIT Kanpur

Academic Research Cell — *Aug. 2017 – Mar. 2018*

- Responsible for encouraging research activities in the campus by conducting talks and workshops.
- Successfully organized Student Research Convention'18, aimed to bring researchers and students across the country under one roof.

Tools

Deadlines, ToDo tool Built two linux command line tools to keep track of all deadlines and ToDo tasks. (link)

GradStats Wrote a python tool to visualize gradient statistics of a given layer of a Pytorch model.

torchprof Contributed to torchprof, an opensource tool for layer-wise profiling neural networks. (link)