

Prakhar Agarwal

THIRD YEAR UNDERGRADUATE · COMPUTER SCIENCE AND ENGINEERING, IIT KANPUR

☎ (+91)9468652335 | ✉ pkhrag@iitk.ac.in | 🏠 home.iitk.ac.in/pkhrag | 📱 pkhrag

Education

IITK (Indian Institute of Technology, Kanpur)

BACHELOR OF TECHNOLOGY, COMPUTER SCIENCE AND ENGINEERING

Kanpur, India

2015 - 2019 (Expected)

- Cumulative Grade Point/ CPI: **9.64/10.0**

Central Public School

RBSE

Rajasthan, India

2013

- **12th** GRADE | Aggregate **89.8%**

Kendriya Vidyalaya, Jhalawar

CBSE

Rajasthan, India

2013

- **10th** GRADE | CGPA **10.0/10.0**

Honors & Awards

- | | | |
|---------|--|------------------|
| 2018 | 2nd Rank , Championship Value Prediction, ISCA | Los Angeles |
| 2015 | All India Rank 126 , among 1.2 million students in JEE ADVANCED | India |
| 2015-17 | Academic Excellence Award , for two consecutive years in IIT Kanpur | Kanpur, India |
| 2015 | 0.1 Percentile , JEE MAINS | India |
| 2014 | KVPY Fellow All India Rank 232 , IISc Bangalore and Government of India | Bangalore, India |
| 2014 | 1 Percentile , Physics Olympiad (NSEP) HBCSE | Rajasthan, India |
| 2014 | Qualified , Chemistry Olympiad (NSEC) HBCSE | Rajasthan, India |

Publication

DFCM++: Augmenting DFCM with Early Update and Data Dependency-driven Value Estimation

Los Angeles, California, US

INTERNATIONAL SYMPOSIUM ON COMPUTER ARCHITECTURE

June 2018

Placed 2nd in Championship Value Prediction Workshop

Work Experience

Samsung Electronics Headquarters

Suwon, South Korea

CLOUD LAB

May 2018 - July 2018

- Worked on prototype for Event Monitoring and Corrective Action for network functions of Samsung.
- Worked on a simulator of the Data Collection, Analytics and Events (DCAE) module of Open Network Automation Platform(ONAP).
- Used various APIs like REST-API, Kafka-python, Durable-rules, etc. to develop the simulator.

Bombay Stock Exchange

Bombay, India

IT DEPARTMENT, SECURITY TEAM

May 2017 - July 2017

- Worked on designing and improving Network security architecture of Bombay Stock Exchange with IBM.
- Found vulnerabilities and audited BSE network with SEBI compliance.

IIT Kanpur

Kanpur, India

TUTOR, INTRODUCTION TO COMPUTING (ESC101)

July 2018 - Present

- An introductory course in C and programming techniques, with more than 450 enrolled students.
- Conducting Tutorial Lectures for a batch of 40 students, once every week.
- Designing and Grading Lab Sessions, Quizzes, Theory and Lab exams.
- Supervising the work of Teaching Assistants.

Projects

Side-Channel Attacks exploiting Speculative Execution

IIT Kanpur

PROJECT, PROF. BISWABANDAN PANDA

December 2017 - Present

- The aim of the project is to discover new side-channel attacks using various speculative techniques like cache, prefetching, out-of-order execution, value prediction, branch prediction, etc.
- Mounted Flush-Reload, Flush-Flush, and other side-channel attacks on current processors.
- Using gem5 simulator to explore new side-channel attacks based on value and branch prediction.

Autonomous Underwater Vehicle github.com/AUV-IITK REPORT

IIT Kanpur

MEMBER, TEAM AUV-IITK, PROF. K.S. VENKATESH & PROF. SACHIN SHINDE

December 2015 - April 2017

- Leader Software Subsystem of team AUV-IITK.
- First Runner-ups at the National level Competition SAVE-NIOT (2016) in debut attempt.
- The aim of the Robot is detecting and following a line, hitting a buoy, firing torpedoes at given targets and dropping objects underwater.
- Implemented the tasks using Robot Operating System (ROS) for Controls, OpenCV for Image Processing and Gazebo for simulation.

Securing ZooBar Server

IIT Kanpur

COURSE PROJECT, PROF. SANDEEP SHUKLA

Jan 2017 - April 2017

- Found various security vulnerabilities in the server code.
- Exploited vulnerabilities using control hijacking techniques like buffer overflow and format string attacks.
- Performed various browser-based attacks like SQL injection, XSS, CSRF on ZooBar web application.
- Fixed security bugs in web server, implemented privilege separation and server-side sand-boxing of executable profiles in the okws server.

Text Generation

IIT Kanpur

COURSE PROJECT, PROF. PURUSHOTTAM KAR

August 2017 - December 2017

- The aim of our project is to capture the artistic style of an author and then generate text in that same style.
- We use character-level language models using multi-layered RNNs/LSTM and attention models on top of that to account for long-term dependencies.
- As an alternative approach, we also aim to use neural style transfer for text in a fashion similar to artistic style transfer for images by Gatys et al.

Introduction to Game Theory github.com/pkhrag/Game-Theory

IIT Kanpur

SEMESTER PROJECT, ACA

January 2016 - April 2016

- Developed an AI for zero-sum games like Tic-Tac-Toe and Connect-4.
- Used min-max algorithm with alpha-beta optimization and heuristic functions.
- Explored Monte Carlo Simulation for computing better heuristic function.
- Implemented feature of connecting two AIs over a network using ZeroMQ library.

Other Projects

Compiler for Golang to x86

Implementing OS Functionality in NachOS

Exploiting Media Projection Vulnerability in Android

Centralized File Storage System

Relevant Courses

Completed

Computer System Security

Operating Systems*

Machine Learning Techniques

Data Structures and Algorithms

Discrete Mathematics

Introduction to Electronics

Computer Laboratory

Compiler Design

Computer Organization

Advanced Algorithms*

Computer Networks

Probability and Statistics*

Multivariable Calculus

Logic in Computer Science

Introduction to Economics

Linear Algebra

Computational Complexity Theory

Theory of Computation

Partial Differential Equation

Abstract Algebra

Introduction to Programming

Computer Architecture*

Ongoing

Secure Memory Systems

Cyber Security of Critical Infrastructures

* : A* Grade for exceptional performance

Skills

Programming	C/C++, Python, X86 Assembly, ROS, Octave, MIPS, Verilog, R, Golang, Java
Web	JavaScript, HTML, CSS, SQL
Utilities	Bash, Git, GDB, \LaTeX , Sublime, Vim, Numpy, OpenCV
Platforms	Windows, Linux(Ubuntu), Arduino, Android, FPGA, Gem5

Positions of Responsibility

ACA Coordinator

IITK

DEPARTMENTAL STUDENT BODY

January 2017 - Present

- Conducted various events in the department like CTFs, Hackathons, and other competitions.
- Organized departmental trip, departmental freshers, farewell and happy hour.

Counselling Service (IITK)

IITK

ACADEMIC MENTOR

August 2016 - July 2017

- Helped students to cope up with academics.
- Took institute level doubt sessions for Fundamentals of Computing course.

Programming Club, IITK

IITK

PROJECT MENTOR

May 2017 - July 2017

- Mentored 20 students in a project Ethical Hacking and Cyber Security.
- Designed a CTF for intra-IITK Science and Technology Championship.