GAURAV SINGH

Computer Science Junior/Undergraduate Researcher

@ gaurav.si@research.iiit.ac.in   vanhalen42   gaurav-singh-448363207

EXPERIENCE

Undergraduate Researcher
Robotics Research Center, IIITH

🗓 May 2022 - Present   📍 Hyderabad, India

Supervised by **Prof. Madhava Krishna** and **Prof. Srinath Sridhar** (Brown University)
Ongoing Projects:
- **Scene Understanding:** Exploring the use of implicit neural representations (like NeRFs) to improve the perception of cluttered table-top scenes.
- **NeRF generalization**: Exploring category level generalization in Neural Radiance Fields.
- **3D shape completion:** Using rotationally equivariant network architectures to better understand 3D structure.

PROJECTS

3D Object Representations: Analysis, Suitability, and Exploration of NeRFs vs Point Clouds [Project Report]

Explored the suitability of implicit and explicit 3D representations for robotic grasping.
Pytorch, Mobile Robotics

AIIIR [Project Page]

A hardware system and software suite for real-time comprehensive air quality monitoring and alert-sending.
Python, ML, Internet of Things

Cirq (Google Quantum AI) [Project Page]

Contributed to removing bugs in the existing **svg visualizations of quantum circuits**

Modifying the xv6-riscv Operating System [Project Page]

Implemented a new syscall (**strace**) and two new schedulers for the operating system: **FCFS** and **Priority-based Scheduler (PBS)**.
C/C++, Operating Systems

Optimal Gameplay Path for Combinatorial Games [Project Page]

Implemented a **tree search algorithm** on a tic-tac-toe game tree to calculate the optimal play strategy from a given position in the game.
C/C++, Combinatorial Game Theory and Tree Search Algorithms

PUBLICATIONS

HyP-NeRF: Learning Improved NeRF Priors using a HyperNetwork
[Arxiv Preprint] (Co-First Author Paper)

SCARP: 3D Shape Completion in ARbitrary Poses for Improved Grasping
**[IEEE Xplore] [Project Page]
(Co-First Author Paper)**

Accepted at 2023 IEEE International Conference on Robotics and Automation (**ICRA**)

ACHIEVEMENTS

- **Dean's Merit List- 2020,2021,2022:** Listed in Merit List for three semesters during 2020-2022
- **Undergraduate Entrance Examination(UGEE):** Secured an all-India rank of **46**

SKILLS

Computer Vision and ML   Pytorch   Pytorch Lightning
Scikit Learn   Pandas   Tensorflow

Programming   Python   C/C++   HTML,CSS,JS
SQL   MERN Stack

EDUCATION

Bachelor of Technology with Masters of Science by Research in Computer Science and Engineering
IIIT, Hyderabad, India CGPA: 8.75/10

🗓 Sept 2020 - Present

All India Senior School Certificate Examination
CBSE Class XII, Gyan Bharati School

🗓 May, 2020   📍 New Delhi, India

Aggregate: **95.4%**

COURSEWORK

Computer Vision   Data Structures and Algorithms
Mobile Robotics   Statistical Methods in AI   Linear Algebra
Computer Graphics   Operating Systems and Networks