Kumar **Devesh**

DEEP LEARNING ENTHUSIAST | CS JUNIOR | IIT ROORKEE

(+91) 9631888106 | kumar_d@cs.iitr.ac.in | kumar-devesh.github.io | kumar-devesh | kumar-devesh-984511218/

"The mind is not a vessel to be filled but a fire to be ignited."

Education

Indian Institute of Technology, Roorkee

Roorkee, India

B.TECH. IN COMPUTER SCIENCE AND ENGINEERING

2020 - Exp. 2024

- CGPA: 8.795/10 (upto 4th Semester)

Work Experience

ETS Montreal

(Remote) Montreal, Canada

RESEARCH INTERN

May. 2022 - Present

- Working on neural network calibration for reliable predictions in a semantic segmentation task by developing a novel label smoothing method for segmentation of medical images mentored by **Prof. Jose Dolz**.
- Augmenting ground truth label information with various distance maps for more informed label smoothing.

Affine Analytics

(Remote) Bangalore, India

ML ENGINEER INTERN

January. 2022 - May. 2022

- Worked on dimension measurement of objects using machine vision and machine learning algorithms.
- Developed subpixel processing pipelines for edge detection and dimension measurements.

Writing

Visualization and Model Explanations in Convolutional Neural Networks

Blog

MAINTAINER

Nov. 2021

- **Blog** on Deep Learning model explanations and activation maps with intuitive explanations and PyTorch implementation.

Projects

Model Extraction of Action Recognition Models

CONTRIBUTOR | RESEARCH PROJECT FOR INTER IIT TECH MEET 10.0

- Performed Model Extraction of Video Swin Transformer and MoviNet trained on the Kinetics datasets in Black Box and Grey Box settings to obtain competitive results in the task.
- Used conditional video generator and adversarial crafting along with knowledge distillation-based techniques.
- Report: **Report**, Implementation: **Code**

SIC/XE Assembler

COURSE PROJECT CSN-252 SYSTEM SOFTWARE | IIT ROORKEE

- Implemented an **assembler** for the SIC/XE architecture as mentioned in the book Software Systems: An Introduction to Systems Programming by Leland L. Beck in Java
- Implemented multiple features like Assembler Directives, Error Messages, Program Blocks, Literal Handling, Expression Handling etc.

CPU design and implementation on Logisim Simulator

COURSE PROJECT CSN-221 COMPUTER ARCHITECTURE | IIT ROORKEE

- Implemented a 32-bit Simple RISC architecture based CPU as described in the book Basic Computer Architecture by Smruti R. Sarangi.
- Implemented features like Program Counter, Register File, Control Unit, Main Memory with Cache Management with a Direct Mapped Cache.

Semantic Segmentation using U-Net

OPEN PROJECT | VISION AND LANGUAGE GROUP

- Implemented the **U-Net Architecture** for semantic segmentation using PyTorch framework on the HELEN* Dataset for performing pixel-level classification of human faces.
- Tried out various loss functions for model training and evaluated the model on class-wise F1 scores.
- Implementation link: **U-Net implementaiton**.

Lowlight Image Enhancement using ZeroDCE

Self Learning Project | Vision and Language Group

- Implemented CVPR 2020 paper Zero-DCE **Zero-DCE** for lowlight image enhancement on the LowLight Images dataset using PyTorch framework.
- Examined the contributions of various losses used in the paper by performing ablations.
- Implementation link: **Zero-DCE implementation**.

Achievements

2022 **Gold Medalist**, Bosch Model Extraction High Prep - Inter IIT Tech Meet10.0

2020 **All India Rank - 339**, Joint Entrance Exam (JEE) Advanced

2020 **All India Rank - 1433**, Joint Entrance Exam (JEE) Mains

Skills

Programming Languages Python, JAVA, HTML, CSS, JavaScript

Packages Pytorch, TensorFlow, Keras, Numpy, sckit-learn, opencv

Utilities Git, nano, Linux Shell

Extracurricular Activity

Vision and Language Group, IIT Roorkee

Roorkee, India

Core Member

May, 2021 - Present

- Core member of VLG, a student group that promotes deep learning research culture at IITR by discussing relevant research papers, organizing workshops and working on related projects.**[Link]**
- Involved in paper discussions, contributing to projects, organizing workshops, mentoring open projects etc.