Kumar **Devesh**

DEEP LEARNING ENTHUSIAST | CS JUNIOR | IIT ROORKEE

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"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: 8.868/10

Work Experience

Trexquant LLP

(Remote) Connecticut, USA

GLOBAL ALPHA RESEARCHER

Oct. 2022 - Nov. 2022

- Worked as an alpha researcher, reading and implementing research papers on technical and macroeconomic alphas based macroeconomic data variables.

ETS Montreal

(Remote) Montreal, Canada

RESEARCH INTERN

May. 2022 - Oct. 2022

- Worked 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**.
- Augmented ground truth label information with various distance maps for more informed label smoothing.

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

Domain Adaptation in Machine Reading Comprehension

CONTRIBUTOR | RESEARCH PROJECT FOR INTER IIT TECH MEET 11.0

- Surveyed and Implemented various domain adaptation algorithms for Retriever Reader Question Answering.
- Ran Experiments on reader model adaptation for BERT and DeBERTa models using CAQA and QADA and evaluated domain adaptation performance using synthetic data generation with SQuAD2.0 as the source domain.
- Report: **Report**, Implementation: **Code**

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**

PAPERS WE READ

CONTRIBUTOR | GITHUB REPOSITORY

- This is an open source repository maintained by Vision And Language Group containing summaries and analysis of recently published research papers. **[GitHubLink]**
- Contributed summaries from top tier Deep Learning Conferences.

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**.

Pytorch implementation of CycleGAN model

Self Learning Project | Vision and Language Group

- Implemented **CycleGAN** for image to image translation from horse images to zebra images on horses2zebras dataset.
- Implementation link: **CycleGAN implementation**.

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.

Achievements

2023 **Bronze Medalist,** DevRev Improving Domain Specific QA - Inter IIT Tech Meet11.0

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.