KARTIKAEYA KUMAR

kartikae@iitg.ac.in
(+91) 8721 834692
kartikaeya.github.io

RESEARCH INTERESTS

Human-Computer Interaction • Applied AI • AR/VR

EDUCATION

B. Tech Indian Institute of Technology (IIT), Guwahati 2018-2022

Major: Electronics & Electrical Engineering
CGPA: 8.80/10 (ranked 5th /51)

Minor: Computer Science & Engineering
CGPA: 8.50/10

RESEARCH EXPERIENCE

Creativity Lab, University of California San Diego
Sept 2021 - Present

Research Intern, Advised by: Prof. Haijun Xia

- Exploring various NLP Techniques to create visualization to aid in the reading of Survey Papers.
- Extracted relationship among cited papers using the syntactic & semantic structure of the text.
- Research Domain: Applied NLP Visualization User-Interface Design

RICELab, University of Toronto
May 2021 - Present

Research Assistant (Previously: MITACS Research Intern), Advised by: Prof. Tony Tang

- Prototyped various techniques for collaborative watching of 360 videos in Unity3D.
- Using Simultaneous Localization & Mapping (SLAM) devised a novel method to watch 360 videos.
- Using Unity's MLAPI Networking library, set up a Client-Server architecture for multi-viewer support.
- Conducted a user-study with 16 participants to evaluate their qualitative experience with the system.
- Research Domain: User-Experience Design Multimedia Systems CSCW

*This work resulted in a full-paper submission to ACM CHI'22.

UE-HCI Lab, IIT Guwahati
Dec 2020 - May 2021

Research Intern, Advised by: Prof. Pradeep G. Yammiyavar

- Developed an Augmented Reality app to elicit user ratings for different architectural CAD designs.
- Created a dynamic form creation functionality in the app for creating survey forms.
- Research Domain: Augmented Reality

VIGIL Lab, IIT Hyderabad
Apr 2020 - Jul 2020

Research Intern, Advised by: Prof. C. Krishna Mohan

- Explored various methods and network architectures for 2D Human Pose Estimation.
- Proposed a novel CNN architecture inspired from the popular U-Net & Stacked Hourglass Network.
- Built the complete ML pipeline (Data pre-processing/Augmentation, model creation, training, inference and evaluation) in Pytorch for testing the proposed network.
- Trained the model on Azure Cloud GPU Instances.
- Research Domain: Deep Learning Computer Vision

PUBLICATIONS

[1] Kartikaeya Kumar, Lev Poretski, Jiannan Li, Anthony Tang. 2021. Tourgether360: Collaborative Exploration of 360° Tour Videos using Pseudo-Spatial Navigation (under review at ACM SIGCHI'22) paper , video

SELECTED PROJECTS

CrossDroneVR: FPV drone simulator for mobile Virtual Reality Oct 2021
Created a physics bases First Person View (FPV) Drone simulator for mobile VR (google cardboard) in Unity. Built a cross-device controller by setting up low-level packet transmission between two mobile devices.

Basic Hand Tracking & Gesture Recognition Feb 2020 - Mar 2020
Used Image processing techniques like thresholding, contouring & convex-hull detection in OpenCV to build a hand gesture recognition system.

Circuit-X: an Image Processing Challenge Sept 2019 - Oct 2019
Developed an Image Processing algorithm to deduce the truth table of a digital circuit from its image.

RELEVANT COURSES

- CS101: Introduction to Computing
- CS205M: Theoretical Foundations of Computer Science
- CS206M: Data Structures and Algorithms
- CS322M: Digital Logic and Computer Architecture
- CS350M: Computer Systems
- CS441M: Software Engineering (ongoing)
- MA102: Mathematics-II
- EE230: Probability & Random Processes
- Introduction to Machine Learning (MOOC)
- Deep learning specialization (MOOC)

HONORS AND AWARDS

MITACS Globalink Research Internship (GRI) award 2020
Awarded for conducting research at a Canadian University.

Shastri Indo-Canadian Institute Research Grant 2020
Additional funding of CAD 1,375 for conducting research under the Mitacs program.

CBSE Board Examination 2018
Awarded a sum of INR 20,000 as scholarship for outstanding performance in board examinations.

TEST SCORES

GRE: 328/340 (170 Quant, 158 Verbal, 4 AWA)

TOEFL: 117/120 (R:30 L:30 S:29 W:28)

SKILLS

Languages: C/C++ • C# • Python • HLSL* • HTML • CSS • JavaScript

Tools/Frameworks: OpenCV • Numpy • LaTeX • node.js

Machine Learning: Google Natural Language API • PyTorch • Keras

AR/VR: ARCore • Google Cardboard SDK

Software: Unity • Blender • Adobe Premiere Pro

Hardware: Verilog HDL • Arduino • Xilinx Vivado(FPGA)