Suraj Sudhakar

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Education

Saarland University **April 2021 – Present**
Master of Science in Visual Computing *Saarbruecken, Germany*

GPA: 1.9 (101 ECTS)

BMS College of Engineering **Aug 2014 - Jul 2018**
Bachelors in Electronics & Communications *Bangalore, India*

GPA: 8.88 (out of 10, German Equivalent GPA 1.6)

HJKP college **2012-2014**
Pre-university degree *Bangalore, India*

GPA: 94.08%

Relevant Coursework

- Neural Networks
- Artificial Intelligence
- Computer Graphics
- Realistic Image Synthesis
- Advanced Image analysis
- Computer Vision
- Space Informatics
- Engineering Mathematics

Research

Online Monocular 3D reconstruction using point clouds | *Python, Pytorch, Blender* **Jan 2023 (present)**

- Topic of my current ongoing Master thesis, developing a novel method to perform 3D reconstruction using point clouds to solve the problem of scene flow for occluded points
- Two point cloud observations from different time instances are registered using scene flow and fused to obtain the reconstructed surface
- Extensive literature review was performed to identify the shortcomings of existing methods
- We identified the key challenges beforehand and designed toy experiments to simulate the problem and possible solutions
- Utilized existing research on scene flow (FlowNet3D) for point cloud and modified it for our problem statement
- Performed extensive experiments on datasets like DeformingThing4D, Deepdeform to test and prove the concept (We expect to publish the results soon)

Work student

CVMP Lab - Computer Vision and Machine Perception Lab **Oct 2022 - Oct 2023**
HiWi (part time) *Saarbruecken, Germany*

- The job entailed a variety of tasks at the newly established lab
- Setting up datasets which consisted of visualizing, writing dataloaders, maintaining folder structure, and overall streamlining of datasets to enable smooth research for the Lab
- Creation of point cloud dataset using RGB videos
- The steps in creating dataset involved camera calibration, april tag based ground plane detection, processing using COLMAP, and segmentation
- Later the other points in the scene were removed to obtain only the point cloud for the object. The pipeline was generalized to be used for future such data collection
- Helping the professor with creating of assignments for the upcoming lecture, and also created the lab website using wordpress

ZeMA Labs - Zentrum für Mechatronik und Automatisierungstechnik gemeinnützige July 2022 – Oct 2023
HiWi (part time) *Saarbruecken, Germany*

- Was responsible for capturing the precise 3D location of a finger shaped robot, the 3D coordinates were later used by other researchers to verify kinematic formulations
- Controlled environment, Marker based, offline - localization setting. Multiple locations on the robot on the robot were installed with markers and video was captured using a stereo setup under controlled lighting conditions
- The video was processed offline, The markers were identified on the robot and the precise 3D location was triangulated

Projects

Exercise Posture Classification using Pose Estimation | *Python, Pytorch, CV* **May 2021**

- As a part of our High level computer vision course work - Categorizing posture quality during exercise into good and bad postures by using Pose Estimation, as a use case we chose the exercise of deadlift
- Involved comprehensive data collection and annotation phases
- Tested several models (UniPose, OpenPose, Omnipose) on the dataset for implementation
- Keypoints were estimated while performing the exercise under varying positions and the resulting skeletal was used to classify the posture into good & bad

Re-identification: Signature Fraud Recognition | *Python, tensorflow* **2021**

- As a part of my bachelor thesis - Designed a Convolution Neural Network system that verifies the user signatures
- A simple CNN-based model was trained on a signature database to learn the right features
- Original signature from the database and the test case were both processed using this trained model and compared in feature space
- User signatures were then verified, thus performing Re-identification for the test case signature
- We published the work at IEEE conference link: SIFR-Signature Fraud Recognition

Experience

Profinch Solutions **July 2020 – Jan 2021**

Software Engineer, Consultant *Bangalore, India*

- Worked as a database software developer using SQL for banking software, Flexcube
- Developed front end web pages using Rapid application development tool and wrote the backend modules for them using SQL
- Created triggers to query, update tables and to maintain data integrity
- Involved in frequent client meetings and communication of updates

Oracle Financial Services Software Limited **August 2018 – August 2019**

Software Engineer, Associate Consultant *Bangalore, India*

- Joined in as a fresher and worked on the same banking software in the consultancy team
- Was able to quickly contribute by fixing critical bugs and handle customizations in major projects
- Worked extensively on CASA & CL (customer account and lending respectively) modules in Flexcube

Technical Skills

Languages: Python, Oracle SQL, C++, MATLAB, JavaScript
Tools/Softwares: Blender, Linux, VS Code,GitHub, HTCondor, Docker, Jupyter Notebook, Oracle Flexcube, WordPress
Python Libraries: Pytorch, Pytorch3D, Numpy, OpenCV, Open3D, Matplotlib, Pandas
Natural Language: Kannada(native), English(C1), Hindi, German(A1)