

## Richa Mishra

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### EDUCATION

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#### Birla Institute of Technology and Science, Pilani

8.04/10, *First Division*

*MSc(Hons.) in Biological Science, B.E.(Hons.) in Electrical and Electronics Engineering*

*July 2014 – May 2019*

### RELEVANT COURSES

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Probability and Statistics, Operating systems, Object Oriented Programming, Neural networks and fuzzy logic, Optimization, Signals and systems, Communication systems

### EXPERIENCE

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#### Research Assistant

August 2021 – Present

*CVIT, IIIT-Hyderabad* Advisor: Dr Avinash Sharma

*Hyderabad, India*

- Working on temporally-consistent 3D reconstruction of human body in loose-fitted clothing. [\[Project page\]](#)
- Working on using peeled representation of a 3D mesh to predict scene flow between consecutive frames.
- Created a pipeline to generate ground-truth peeled representation using backward ray tracing.

#### Software Engineer

July 2019 – July 2021

*Business Intelligence, HSBC Software Development India*

*Hyderabad, India*

- Fulfilled the monthly regulatory requirements by sending reports to CRAs, Equifax and Experian by analyzing data from the data warehouse tables of more than 7 million customers.
- Accommodated ad hoc requests for changes in the reports due to COVID-induced changes in UK government policies.
- Identified and corrected the scripts that were misquoting the credit and debit turnover values to the regulatory agencies in the order of millions of dollars. Received recognition for the work by the Head of Business Standards and Governance.

#### Research Assistant

February 2019 – June 2019

*Max Planck Institute for Intelligent Systems* Advisor: Dr Silvia Zuffi, Dr Sergi Pujades

*Tuebingen, Germany*

- Created registration pipelines for learning surface and skeleton parametric models for rats from CT scans. [\[Thesis\]](#)
- Processed CT scans of rats to extract surface and skin pointclouds.
- Created a template mesh by fitting a Global/Local Stitched Shape model (GLOSS) to toy figurines of rats and optimized the registration by aligning keypoints and then using ARAP regularizer for free-vertices alignment, finally learning a realistic shape-space for the surface model.
- Employed a segment-wise registration method by manually segmenting the template mesh for the skeleton model into 33 parts in Blender to achieve better articulation while preserving the rigidity of bones. Also introduced a pose-prior loss term which improved the quality of the registered meshes.

#### Computer vision research intern

July 2018 – November 2018

*CAMP-AR, Technical University of Munich* Advisor: Dr Federico Tombari

*Munich, Germany*

- Compared two methods to produce a two-layered LDI (Layered Depth Image) representation from a single RGB image. [\[Thesis\]](#)
- Leveraged the Resnet-50 architecture to predict a depth map and a mask and used the pix2pix network to inpaint the masked RGB image and produce the second layer of the LDI representation.
- Implemented a paper by Tulsiani et al. and compared the results. Optimized the loss function that resulted in a better prediction for second layer RGB image.

#### Summer student

May 2017 – July 2017

*Institute of Mathematical Science* Advisor: Dr Areejit Samal

*Chennai, India*

- One of the 15 people selected across the country to participate in a two month long summer school.
- Trained machine learning classifiers to classify a given protein sequence as an effector or a non-effector protein on a dataset of protein sequences experimentally verified to be involved in pathogenic activities in plants.
- Created appropriate negative dataset from sequences of non-effector secretomes from the same plant species and sampled the training dataset by varying the ratio of sequences from the positive and negative datasets.
- Compared the performance of classifiers trained on features selected manually based on the literature with those selected by PCA.

## PROJECTS

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### **Multi-camera setup for dynamic data collection** | *Computer vision*

- Working on a calibration module for 4 kinect azure and upgrading the pipeline based on Truncated Signed Distance Field (TSDF) to Microsoft's Fusion4D.

### **Cross-domain adaptation for image classification** | *Computer Vision*

- Designed a model with a pre-trained ResNet-50 as a feature-extractor and a classifier that trains on labelled source domain (images) and unlabelled target domain (sketches).

### **Fuzzy logic controller for a UAV** | *Neural networks and fuzzy logic*

- Implemented a paper that employed fuzzy logic to design vertical and horizontal controllers for a UAV using MATLAB/Simulink. Used kinematic equations for UAV control and defined membership using C-means clustering.

## TECHNICAL SKILLS

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**Languages:** C/C++, Python, Java, SQL, Verilog

**Cloud and deep learning frameworks:** GCP, Pytorch, Pytorch3d, Tensorflow, MATLAB, Blender, Meshlab

## WORKSHOPS

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**Deep Learning workshop - Neuromatch Academy; August, 2021:** Accepted to participate in DL workshop organised by Neuromatch Academy which is a 3-week intensive computer vision training program.

## AWARDS AND RECOGNITION

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**International Undergraduate Excellence Award:** Recipient of one of the four International Undergraduate Excellence Award 2018 by the chair of Computer-Aided Medical Procedures and Augmented Reality (CAMPAR) at the Faculty of Informatics and Mathematics, Technical University of Munich. This included a scholarship of 4500 euros and an invitation to spend a semester at TUM.

**International Programs and Collaborations Division (IPCD) Scholarship:** Recipient of International Programs and Collaborations Division (IPCD) Scholarship by BITS-Pilani for pursuing an off-campus thesis abroad.

## MISCELLANEOUS

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**Joint-Coordinator of the Department of Informalz, BOSM (BITS Open Sports Meet), 2016.:** Led a 3-tiered team of 25 people for a period of 2 months for organising and monitoring 4 events in a fest with a footfall of over 10,000 students.

**Core member of Photography Club.:** Created and displayed theme-based panels for Photography Club Exhibition, "Exposure" in the cultural fest, 2015 and APOGEE, 2016.