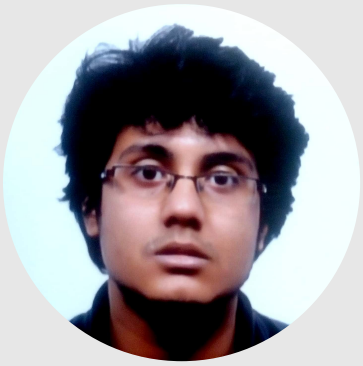

Aratrik
Chattopadhyay

Gmail

LinkedIn

Google Scholar

Research Gate

Education

M.E System Science and Automation IISc,Bangalore | 2015-2017 | GPA: 6.2/8.0

B.E.Electrical Engineering Jadavpur University | 2011-2015 | GPA: 8.5/10

Class XII | Nava Nalanda High School | 2009-2011 | 93.5 %

Class X | Nava Nalanda High School | 2007-2009 | 95%

Achievements and Awards

Technical Publication Award 2024 - Daimler

High Quality Patent Award 2022 - Daimler

Young Inventor Award 2021 - Daimler

AIR 5 in GATE 2015 - Electrical Engineering paper

State Rank 221 - WBJEE (West Bengal Joint Entrance Examination)

State Rank - 1000 in AIEEE

Industry Experience- Mercedes Benz R&D Pvt.Ltd.

June'22 - Present **Facial Analysis in WFOV Cameras** — **Senior Tech Lead**

- Leading development of multi-view ground truth systems for estimating eye-gaze, head position and 3-D facial landmark estimation.
- Developed deep learning architectures for head pose regression in WFOV (Wide Field of View) cameras. The proposed method uses a novel and learnable car invariant transformation module for regressing head pose in Mercedes-Benz car interiors. The product will be shipped as part of DMS (Driver Monitoring System) across all Mercedes-Benz car interiors.

Jun'20 - Jun'22 **On Device Facial Analysis** — **Senior Research Engineer**

- Implemented an architecture for regressing head pose from facial landmarks using random forests. The architecture has close to state-of-the art performance with the benefit of low memory footprint and fast computation.

Jun'20 - Jun'22 **Facial Analysis beyond Real Data** — **Senior Research Engineer**

- Developed deep learning architectures for facial landmark detection using synthetic data.
- Developed domain adaptation techniques for deployment of architecture in Mercedes-Benz Car Interiors.

Dec'18-June'20 **Human Pose and Hand Pose estimation** — **Junior Research Engineer**

- Developed novel and on-chip deployable deep learning architectures for gesture detection and recognition in Mercedes Benz car interiors.
- Worked on Stacked Hour Glass networks for hand localization and driver/co-driver hand distinction for user profile based personalisation. Demonstration of the project can be found at this Link

Publications

Sep'2024 **Learned Ranking and Contrastive Loss for robust Head pose estimation** — **Paper Link**
International Conference on Image processing, 2024, Oral

Apr'2024 **Reinforcement Aided Adaptive Vector Quantization of Deep Neural Networks** — **Paper Link**
Computer Vision and Pattern Recognition, Workshop, 2024.

Sep'2021 **Detail Preserving Conditional Random Field as 2-D RNN for Gland Segmentation in Histology Images** — **Paper Link**
Pattern Recognition Letters 2022.

Nov'2020 **End-to-End Differentiable 6DoF Object Pose Estimation with Local and Global Constraints** — **Paper Link**
DiffCVGP Workshop, Neural Information Processing Systems 2020

Journals Reviewed

IET Image Processing, TIP, Neurips

Seasoned Subjects

Linear Algebra, Probability Theory, Pattern Recognition and Machine Learning, Linear and Non-Linear Optimization, Convex Optimization, Advanced Topics in Computer Vision (3D Vision), Data Structure and Algorithms, Computer Graphics, Game Theory

Test Scores

GRE: 166Q /154V
TOEFL : 102/120
IELTS: 7.5/9.0

Skills

Languages: Python, Lua, C, C++, Matlab
Library: Pytorch, Torch, Tensorflow, Pytorch3D
Other: Git, JIRA, Confluence

Extra-Curricular

Technical volunteer in SPCOM (International Conference on Signal Processing and Communication)

Member of the organizing committee of CONVOLUTION, a Technical fest organized by department of electrical engineering, Jadavpur University

Patents Filed

June'21 **Hand Pose Classification using unsupervised hand crop for car interiors (Patent ID: 2021P02795IN)**

June'21 **System and method for determining orientational attributes of a child seat in a vehicle (Patent ID: 2021P02749IN)**

June'20 **Smart hand crop estimation (Patent ID: 2020PF02515)**

June'19 **Hand Pose Estimation in Vehicles (Patent ID: 2019P01559 IN)**

Research Projects

May-Nov'18 **Image Segmentation** **Research Assistant, Indian Statistical Institute, Calcutta**

- Proposed a novel 2-D recurrent neural network (RNN) which exploits spatial relationship and Gibbs energy between pixels in an image to perform accurate image segmentation.
- The proposed method is capable of preserving fine edges between objects and achieves state-of-the-art performance in different metrics in two publicly available benchmark datasets.

June-May'18 **Unsupervised object detection and recognition** **Research Assistant, Indian Statistical Institute, Calcutta**

- Developed a novel unsupervised algorithm to detect the grocery products present in supermarket stores in cluttered scenarios. We exploited edge and contour information present in supermarket images to achieve competitive results on public benchmark datasets.
- Developed a novel deep learning based pipeline to recognize grocery products from single training images.

Dec-May'17 **Loop Closure prior to boost 3D Scene registration performance** **Master's Thesis, IISc Bengaluru**

- Analyzed how loop closure event detection can act as a rigid constraint for boosting 3D scan registration.
- Experiments on publicly available benchmark datasets yielded comparative performance with current state of the art registration pipelines.

Mini Projects

June-Oct'16 **Computer Graphics** **IISc Bengaluru**

- Implemented various 3-D tranformations like Rotation, Panning, Zooming, Trackball, Explosion to interact with a 3-D object. Moreover implemented Phong shading, Gouraud shading for visualisation of the given 3-D object.
- We explored various techniques for visualizing flow of ocean currents and various other fluid objects using line integral convolution and image based flow visualisation. The project was selected in top 5 best projects. Demonstration of the project can be found at Link
- **Library used**: OpenGL