



# Pushkar Ambastha

Roll No.: 210106050

B.Tech - Bio Science and Bio Engineering

Indian Institute Of Technology, Guwahati

+91-9905914189

p.ambastha@iitg.ac.in

pambasthabiz1853@gmail.com

Github | Website | LinkedIn

## EDUCATION

| Degree/Certificate | Institute/Board                          | CGPA/Percentage | Year         |
|--------------------|--|-----------------|--------------|
| B.Tech. Major      | Indian Institute of Technology, Guwahati | 7.48 (Current)  | 2021-Present |
| Senior Secondary   | CBSE Board                               | 92.2%           | 2021         |
| Secondary          | CBSE Board                               | 95.2%           | 2019         |

## EXPERIENCE

- University of Utah** Nov 2022 - Feb. 2023  
*Research Intern* U.S.A
  - Domain Adaptation :
    - \* Fine-tuned **U-Net**, **DeepLabV3** model on GlaS Dataset MICCAI 2015, CRAG, CPM15 to observe domain dependency of models on the dataset, created a pipeline to improve Image masks **mIOU** and **Dice Score**
    - \* Calibrated **U-Net**, and **MobileNet** on Multiclass Segmentation datasets such as Cityscapes and Synthia
  - Model Explainability :
    - \* Successfully trained **U-Net**, **DeepLabV3** on similar datasets, found accuracy drops due to the difference in their activation layers, and analyzed the contrasting nature of datasets based on texture and colors and developed a complete Image processing **pipeline**

## PROJECTS

- Domain-specific Question Answering chatbot** Dec 2022 - Feb 2023  
*11th Inter IIT TechMeet, IIT Kanpur* Github
  - Developed a question-answering system by retrieving the top candidate sentences from the corpus, used up to free collab resources, and **quantized** models to keep **latency** less than 1000 ms.
  - Developed question-answering **pipeline** using techniques like model distillation, sparsification, pruning, and fine-tuning the **DebertaV3-Base** model to decrease inference time and have a minimum loss in accuracy.
- Re-colorisation of monochrome images using conditional GANs** Aug 2022 - Sep 2022  
*Coding Club, IIT Guwahati* Github
  - Trained a conditional Generative Adversarial Networks model (Discriminator and Generator) based on **U-Net** block with **Resnet18** backbone and devised **Image Processing** strategies for colorization of monochrome images.
  - Deployed a web app using **Streamlit** library on HuggingFace for the fine-tuned model over the **COCO** dataset.
- Captcha Breaker Project** Aug 2022 - Dec 2022  
*Consulting and Analytics Club, IIT Guwahati* Github
  - Deployed a **Computer Vision** program using **Streamlit** library that recognizes Text-based **Captcha** images and converts them into writable text.
  - Developed the **pipeline** using **Pytorch** involving the **RCNN** model, giving the **CTC** Loss as 0.03.
- Cover Generation using OpenAI tools** Jan 2023 - March 2023  
*IITG.ai Club, IIT Guwahati* Github
  - Developed a **multi-modal** pipeline that converts **audio/text** input into **images** using state-of-the-art **OpenAI** tools. Generated optimal transcripts for the podcasts and songs with **OpenAI Whisper** to use in creating prompts.
  - Designed **pipeline** with Latent Diffusion Models (**DALL-E**) to generate aesthetic cover images from created prompts using **ChatGPT/GPT-2** models.
- Super Resolution Photographic Mosaic** March 2023 - April 2023  
*Coding Club, IIT Guwahati* Github
  - Developed a **Computer Vision** pipeline that enhances the images by **super-resolution** and image **stitching**.
  - Designed multi-model **pipeline** that consists of mainly Latent Diffusion Upscaler model for super-resolution and Image Stitcher for creating a **panorama**.

## TECHNICAL SKILLS

- Programming:** Python, PyTorch, Tensorflow, OpenCV, Keras; C/C++; Latex; Matlab;
  - Web technologies:** HTML, CSS, Streamlit, Gradio, Javascript\*, Flask\*
  - Machine Learning/Data Analysis:** Deep Learning, including CNNs, RNNs, VAEs, GANs, Bayesian NNs, Transformers; Machine Learning, KNN
- \* Elementary proficiency

## KEY COURSES TAKEN

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- **Mathematics:** Linear Algebra, Basic Calculus, Complex Analysis
- **Computer Science:** Data Structures and Algorithms, Computer Lab
- **Online MOOCs(Coursera):** Machine Learning, Deep Learning, NLP, Computer Vision

## POSITIONS OF RESPONSIBILITY

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- **Coordinator**, Coding Club, IIT Guwahati *Jun 2022 - Present*
- **Associate**, Consulting and Analytics Club, IIT Guwahati *Aug 2022 - Present*
- **Associate**, IITG.ai Club, IIT Guwahati *Sep 2022 - Present*

## ACHIEVEMENTS

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- **Inter IIT Tech Meet 11.0**, Secured **Gold** Medal in High Prep problem statement by DevRev.ai *2023*
  - **Joint Entrance Examination (Mains)**, Achieved a percentile of **99.29** *2021*
  - **Joint Entrance Examination (Advanced)**, Secured All India Rank **8512** among **2,50,000** applicants *2021*
  - **NEST 2021-22**, Secured All India Rank **140** among **1,00,000** candidates *2021*
  - **PRMO 2019**, Qualified for the Pre Regional Mathematics Olympiad *2019*
  - **NTSE 2019**, Secured a seat (first stage) in the top **8000** out of **12,00,000** candidates. *2019*
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