# Hritam Basak

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## Research Interests

**Broad interest**: Computer Vision, Deep Learning, Medical Image analysis

**Specific interest**: Annotation-efficient Learning, Image Segmentation, Domain Adaptation, Optimization

## Education

**Stony Brook University** — Aug. 2022 – Present
*Doctor of Philosophy (Ph.D.) in Computer Science* | *Grade* : 3.89/4 — *New York, USA*

**Jadavpur University** — Jul. 2017 – May 2021
*Bachelor of Engineering in Electrical Engineering* | *Grade* : 8.9/10 — *Kolkata, India*

## Experience

**Graduate Research Assistant** — Jan. 2023 – Present
*Stony Brook University – Advisor: Dr. Zhaozheng Yin* — *New York, USA*

- Summarized medical applications of computer vision encompassing semi-supervised and contrastive representation learning using minimal annotations ($\leq$10%).
- Proposed novel pipeline by utilizing pseudo-labels in contrastive learning, which outperformed state-of-the-art methods by $\sim$5% DSC score.
- Published research papers at CVPR 2023, MICCAI 2022 and 2023, ICASSP 2023 with acceptance rates of 24.8%, 13%, 27%, and 42%, respectively.

**Data Scientist** — Jun. 2021 – Jul. 2022
*Tata Digital Limited* — *Mumbai, India*

- Engineered a visual search engine for fashion recommendations using RCNN for foreground extraction and pre-trained ResNet for feature extraction, achieving over 96% accuracy.
- Developed an automated human-in-the-loop system to annotate Tata Group's native 20M+ fashion image dataset.
- Designed a promotion recommendation algorithm for 80M customer groups employing Churn and CLTV, and collaborative filtering.

**Research Internship** — May 2020 – Aug. 2020
*ETH Zurich – Advisor: Dr. Luc Van Gool* — *Zurich, Switzerland*

- Guided a team of 5 undergraduate students to execute cross-image context mining for label-efficient semantic segmentation employing neural co-attention.
- Collaborated on cross-image pixel contrast project to enforce pixel embeddings belonging to the same semantic class to be more similar than embeddings from different classes.
- Composed over 1000 lines in the ContrastiveSeg repository for understanding contextual dependencies among pixels.

## Technical Skills

**Languages**: Python, MATLAB, Java, C/C++, SQL, JavaScript, HTML/CSS
**Libraries**: Pytorch, TensorFlow, OpenCV, Pandas, NumPy, Matplotlib

## Achievements/Awards

- **IEEE SPS Grant, 2023** for presenting work at IEEE ICASSP (Acceptance Rate - 1%).
- **MICCAI STAR Award, 2022** for exhibiting research at MICCAI (Acceptance Rate - 11%).
- **Charpak Fellowship, 2020** for Summer Research Internship in France (Acceptance Rate - 28%).

## Selected Publications

- *H Basak*, Z Yin. Pseudo-label Guided Contrastive Learning for Semi-supervised Medical Image Segmentation, **CVPR 2023**
- *H Basak*, Z Yin. Semi-supervised Domain Adaptive Medical Image Segmentation through Consistency Regularized Disentangled Contrastive Learning, **MICCAI 2023** [Early Accept: top 13%]
- *H Basak*, S Chattopadhyay, R Kundu, S Nag, R Mallipeddi. Ideal: Improved Dense Local Contrastive Learning For Semi-Supervised Medical Image Segmentation, **IEEE ICASSP 2023**