

# SUBHAM SHOME

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## RESEARCH INTEREST

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Computer Vision, Image Processing, Deep Learning, Astroinformatics, Applied Mathematics, Semantic Segmentation

## EDUCATION

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**Pazmany Peter Catholic University (PPCU), Budapest, Hungary** Expected Aug 2024

**Autonomous University of Madrid (UAM), Madrid, Spain**

**University of Bordeaux (UBx), Bordeaux, France**

*Master of Science in Image Processing and Computer Vision (IPCV)*, Current Grade: 4.17/5

**Amity University Kolkata, India**

Aug 2015 - May 2019

*Bachelor of Technology in Electronics and Communication Engineering*, Grade: 9.26/10

## RESEARCH PROJECTS

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**Multi-class Classification on Sloan Digital Sky Survey (SDSS) DR14 data** Aug 2023

- Executed a comparative analysis of various machine learning classification models on the SDSS DR14 dataset for the multi-class classification of galaxies, stars, and quasars, leveraging spectroscopic and photometric data.
- Attained accuracy levels of 99.4% and 99.1% utilizing ensemble learning techniques, namely XGBoost and Random Forest respectively.

**Deepfake Detection**

May 2023

- Accomplished image forgery detection using statistical machine learning algorithms including SVMs, combined with texture analysis using image processing techniques, attaining accuracy rates of 97% on UADFV dataset.
- Utilized transfer learning for improved outcomes, resulting in a 96% accuracy and enhanced AUC curve during inter-database analysis on the Celeb-DF dataset.

**Detection of lesions in retinal fundus images (BTech Thesis)**

May 2019

- Developed an algorithm that segmented out the Optic Disc from fundus images, and then performed deep learning using CNN to detect lesions like glaucoma.
- Achieved 94% and 89% accuracy for optic disc segmentation on IDRiD and DRISHTI-GS datasets respectively, and 88% accuracy for detection on IDRiD dataset.

## SKILLS AND EXPERTISE

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**Languages** Python, Matlab, C++, C, SQL

**Libraries** Tensorflow, Keras, OpenCV, Scikit-learn, Pytorch, Scikit-image, Numpy, Pandas, Matplotlib

**Tools** Git, L<sup>A</sup>T<sub>E</sub>X

## HONOURS AND AWARDS

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- **Sponsorship - Synapse AI Symposium** Jun 2023  
Selected among Synapse AI Symposium's top 50 candidates at Milan, alongside global AI luminaries.
- **Winner - Cybathlon 2024** Apr 2023  
Secured Cybathlon 2023-24's Vision Assistance Challenge victory among 21 global teams at ETH Zurich.
- **Erasmus+ Grant** Jan 2023  
Chosen along with 9 applicants to receive the prestigious Erasmus+ Grant as funding for studies in Europe.
- **IPCV Excellence Scholarship - 100%** Apr 2022  
Granted full IPCV scholarship as one of only 3 non-EU citizens selected from more than 1000 applicants.
- **Silver Medalist in Academics, BTech** Oct 2019  
Earned Silver Medal for B. Tech ECE with 9.26/10 GPA across 4 years.

## PROFESSIONAL EXPERIENCE

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### Deep Learning Intern

Jan 2023 - Mar 2023

*Indian Statistical Institute*

*Kolkata, India*

- Designed, trained, and assessed advanced models using TensorFlow and PyTorch, particularly focusing on Convolutional Neural Networks (CNNs).
- Applied gained expertise to more than 3 projects, showcasing hands-on experience in deep learning techniques, with a specific emphasis on CNNs.

### Software Developer

Jun 2019 - Aug 2022

*Tata Consultancy Services Ltd (TCS)*

*Kolkata, India*

- Drove a 20% automation of Walmart's monitoring system, amplifying weekly team efficiency by over 30%.
- Designed and implemented 5% of the UI for Walmart Academy using React JS, and curbed bugs by 15% in 6 months within the ASDA.com production framework.

### Image Processing and Machine Learning Intern

May 2018 - Jul 2018

*Indian Statistical Institute*

*Kolkata, India*

- Mastered the foundational mathematical concepts underpinning a range of statistical machine learning models like Support Vector Machines (SVMs), Random Forests, and Logistic Regression. Became proficient in various image processing techniques encompassing filtering, segmentation, and transforms.
- Initiated the development of an automated system for detecting eye diseases from retinal fundus images, achieving an 86% accuracy, a project that subsequently formed the basis of bachelor's thesis.

## CERTIFICATIONS

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- **Deep Learning: From perceptrons to diffusion models** Mar 2023  
Indian Statistical Institute, Kolkata
- **Mathematics for Machine Learning** May 2022  
Imperial College of London
- **Computer Vision, Graphics and Image Processing** May 2018  
Indian Statistical Institute, Kolkata