DEBARPAN DAS

Computer Vision Researcher │ dasdebarpan10@gmail.com │ +1 (780) 932-5567 │ LinkedIn │ GitHub │ Google Scholar

SUMMARY

Computer Vision Researcher with a proven record of delivering high-impact research and development solutions. With an extensive background in deep learning, medical imaging, statistical modelling and advanced analytics, I have gained hands-on experience in not only developing novel AI-empowered solutions but also integrating them into both clinical and business frameworks. Advanced proficiency in PyTorch, SQL, HPC (Compute Canada) and Cloud Platforms (Google Cloud Platform). Known for cross-functional collaboration, ownership mindset, and strong communication in both technical and go-to-market contexts.

EDUCATION

- UNIVERSITY OF ALBERTA - Master of Science, Radiology and Diagnostic Imaging (GPA: 3.9/4) [2023]
  Supervisors: Professor Kumaradevan Punithakumar, Professor Derek Emery
  Thesis: AI-assisted mole detection for online dermatology triage in telemedicine setting (https://doi.org/10.7939/r3-yhtz-p450)

- JADAVPUR UNIVERSITY – Bachelor of Engineering (First Class Hons.), Department of Electronics and Telecommunication Engineering (GPA: 8.8/10) [2020]

WORK EXPERIENCE

Data Science Researcher (*OROHealth Inc / University of Alberta*)   *Edmonton & Montreal, Canada*
March '22 – February '23

- Built and deployed a mobile-first deep learning triaging system (Vision Transformer using PyTorch) using PyTorch and SQL on Google Cloud Platform to segment and detect melanoma from dermatology images, with a recall rate of 95% in clinical settings reducing diagnostic delays from 92 to 2 days.
- Conducted custom experiments across ViT, NesT, BiT, ViT_21k, InceptionV4 via varying parameters such as learning rates and schedulers, loss functions, gradient accumulation batch, optimizers, etc
- Implemented robust validation protocols, including cross-validation, dataset imbalance prevention, and data leakage prevention strategies to ensure generalizability and performance compliance.
- Analyzed the performance of classical models in RGB, YCrCb and HSV color spaces to objectively segment skin from non-skin areas across multiple Creative Commons images.
- Curated custom dataset by merging images from a HIPAA-compliant clinical database with publicly available DANDERM dataset to mitigate dataset imbalance and prevent model bias
- Collaborated with the Data Science team as well as the compliance teams to support audit trails and maintained interpretability for clinical review.
- Communicated results as well as published the findings of this study in a peer-reviewed journal, Informatics in Medicine Unlocked (2023): https://doi.org/10.1016/j.imu.2023.101311
- Tools: Python, PyTorch, MlFlow, Git, SQL, Docker, Google Compute Engine, Google Buckets, Container Registry, LaTeX

Graduate Research Assistant (*University of Alberta / Alberta Health Services*)   *Edmonton, Canada*
Sep '20 – Feb '23

- Spearheaded the end-to-end implementation of a VoxelMorph-based deformable moving mesh registration framework in PyTorch for cardiac MRI images via a Unet-based image segmentation and registration framework with a mean Dice score of 0.82.
- Implemented registration algorithms (VoxelMorph, SimpleITK, Demons, etc) on MRI and DICOM cardiovascular and neuro-images followed by creating visualizations of corresponding image-mask overlay in 3DSlicer
- Coordinated cross-functional research protocols with radiologists and ethics boards to access and manage sensitive clinical image database following Good Clinical Practices.
- Performed complex troubleshooting in cloud computing clusters of Graham and Cedar of Compute Canada for model training scheduling and assisted in leading initiatives to solve problems in segmentation and visual rendering.
- Tools: Python, PyTorch, Git, SQL, LaTeX, Jira, Bitbucket, 3Dslicer, Mango, SimpleITK, Demons, ANTS

Clinical Research Specialist (*Kent Imaging Inc*)   *Calgary, Canada*
November '23 – present

- Led end-to-end development of predictive models using PyTorch, scikit-learn, and SQL on EMR and multi-site NIRS imaging datasets to analyze patient-outcomes across treatment vs control arms.
- Spearheaded the validation of Plantar-Palmar Index (PPI), a robust Peripheral Arterial Disease (PAD) assessment metric using real-world clinical evidence to potentially replace state-of-the-art Ankle Brachial Index (ABI) assessment (statistically significant: $p < 0.005$). Paper link: https://doi.org/10.63676/m0ww6304
- Spearheaded the data monitoring, validation and analysis of a Randomized-Controlled Trial (RCT) to assess the effect of device's treatment vs SOC on patient-outcomes via A/B tests, ANOVA, Chi-squared test, GLM, Logistic regression, Kaplan Meier Survival Analysis, Percentage Area Reduction (PAR) of Wound, etc.

- Spearheaded the data processing and analysis of a real-world clinical evidence study (19k+ wounds) from multi-state (US) databases to showcase the clinical, economic and diagnostic outcome of product usage and 62% improved healing rate of Pressure-Ulcers with respect to previously published control healing rates. Paper link: https://doi.org/10.12968/jowc.2025.0172
- Delivered customer-facing presentations and data stories using Tableau and PowerPoint at international conferences (e.g., SAWC, CAMPS), enabling strategic decision-making and faster adoption cycles.
- Collaborated with Operations and Regulatory teams to support successful approval of FDA and CER clearances of multiple products.
- Provided subject matter expertise via technical consultations and enablement sessions for clients, shortening onboarding time by 3 months.
- Tools: Python, PySpark, statsmodels, doWhy, PyMC, EconML, SQL, SPSS, Tableau, RedCap, GitHub, Jira, HubSpot, Smartsheets

PROJECTS

Evaluation of Retinal Vessel Segmentation with Dark Channel Prior dehazing (CMPUT 610)
- Implemented a dehazing technique based on Dark Channel Prior (DCP) along with other traditional illumination correction methods for preprocessing fundus images (DRIVE dataset) for retinal vessel segmentation
- Evaluated the effect of this technique across modern segmentation frameworks: U-Net, LadderNet and DU-Net and compared their performance metrics. Find project write-up and results here.

Automatic Segmentation of Hepatocellular Carcinoma Based on Deep Learning and Convolutional Neural Networks
- Implemented an end-to-end U-Net segmentation framework for viable tumor tissues from Whole Slide Histopathology Images (WSI) of liver from the PAIP 2019 segmentation dataset achieving a max mean dice score of 0.62 from sampled images.
- A poster for this study was selected to be presented at the CEPS Poster Day at University of Guelph. Poster can be viewed here.

RELEVANT COURSEWORK

- JADAVPUR UNIVERSITY (B.E.) – Pattern Analysis and Machine Intelligence, Computer Programming and Numerical Analysis, Data Structures and Algorithms, Digital Signal Processing, Signal Theory and Noise, Computer Organization and Architecture, Control Engineering, Probability theory, Linear Algebra and Statistics, Vector Algebra, Calculus
- UNIVERSITY OF ALBERTA (MSc) – Image Processing and Analysis in Diagnostic Imaging (RADDI 514), Deep learning for Medical Image Analysis (CMPUT 605), Advanced topics in Computer vision and Computer Graphics (CMPUT 610)
- CERTIFICATIONS – Machine Learning, Regression Analysis, Statistics, Translating Data into Insights, Python programming, Data Science (all from Google Advanced Data Analytics Professional Certificate)

TECHNICAL SKILLS

- **Languages and Frameworks:** Python (PyTorch, Tensorflow, Scikit-learn, SciPy, Nibabel, Nipy, Pydicom, Numpy, Pandas, OpenCV, statsmodel, Dask, PySpark, doWhy, EconML, PyMC, HuggingFace Transformers), Colab, C++, SQL, MATLAB, SPSS
- **Databases:** MS SQL Server
- **Visualization and Storytelling:** Seaborn, plotly, matplotlib, 3DSlicer, Mango, Tableau, PowerBI
- **Statistical Methods:** Regression, Classification, Imputation (MICE), Hypothesis Testing (ANOVA, GLM, Linear/Logistic Regression, Chi-Squared Test, Maximum Likelihood Estimation, etc), A/B Testing, Time-to-Event/Survival Analysis (Kaplan Meier curves)
- **Machine Learning/ Deep learning:** Supervised and Unsupervised Learning (Regression, XGBoost, SVM, CNN, Transformers), Hyperparameter Tuning (Random and Grid Search, Bayesian and Gradient Optimization), Model Evaluation (Confusion Matrix, ROC/AUC, p-values, R^2)
- **Cloud and DevOps**: Git, Docker, singularity, Compute Canada, Google Cloud Platform, MLflow
- **Interpersonal skills**: Technical Documentation, Public Speaking, Critical thinking, Continuous learning and Collaborative Mindset

PUBLICATIONS

- **Das D**, Ergin E, Morel B, Noga M, Emery D, Punithakumar K (2023) AI-assisted mole detection for online dermatology triage in telemedicine settings. Informatics in Medicine Unlocked. DOI: https://doi.org/10.1016/J.IMU.2023.101311
- Kelso MR, Ohrt AR, Brunkan E, Flynn D, Riley L, Tettelbach WH, Pinky NN, **Das D**, Feight J, Niezgoda J (2025) Use of near infrared spectroscopy in post-acute care: analysis of real-world clinical decision-making. DOI: https://doi.org/10.12968/jowc.2025.0172
- Niezgoda JA, **Das D**, Pinky NN, Gopalakrishnan S, Jones G, Neville R, Walkar C, Niezgoda J (2025) The plantar-palmar index with near infrared spectroscopy as an alternative to the ankle-brachial index for non-invasive evaluation of vascular perfusion and peripheral arterial disease. The International Journal of Tissue Repair (IJTR). DOI: https://doi.org/10.63676/m0ww6304

AWARDS AND ACCOMPLISHMENTS

- Highest Scoring Clinical Poster abstract at Symposium of Advanced Wound Care (SAWC) - May 2025
- Mitacs Business Strategy Internship Research A ward ($45k) – 2022-23
- Mitacs Globalink Graduate Fellowship ($15k) – 2020
- Mitacs Globalink Research Intern award ($8k) – 2019
- First class honours' graduate from Jadavpur University, BE
- Co-founder and Vice president of Finance (Treasurer): Graduate student association of Radiology and Diagnostic Imaging, University of Alberta