Dheeraj Bharti

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ACADEMIC DETAILS

Year	Qualifications	Educational Institute	Marks
2018-23	MTech + PhD	Indian Institute of Technology, Kanpur	8.20/10
2010-14	B. Tech (EC Engg.)	National Institute of Technology, Bhopal	8.03/10
2010	Class XII	Choudhari Mother Care School	83.00 %
2008	Class X	St. Xavier's High School	86.86 %

PATENTS

- **System For Facilitating Autonomous Landings Of Fixed-Wing Aircraft During Single-Pilot Operations And Method Thereof** (Application No: 202411037540) includes a novel framework to detect and extract geometric features from a visible runway to predict the slant distance remaining to land, lateral and vertical deviation from glide slope and height above ground. (DRDO Secrecy Direction) [Mar 2024]
- **A Robust Dehazing Algorithm In CIELAB Colour Space** (Patent No. 409437) includes Dark Channel Prior and mask R-CNN deep neural network to separate foreground and background for transmission map refinement for aviation use-case. [Apr'2022]

WORK EXPERIENCE

- Working as a **Post-Doctoral Researcher** at **EMBRAPA Digital Agriculture**, Sao Paulo, Brazil, on Semantic localization and mapping by proximal multimodal sensing robotics for precise agricultural automation. [Mar 2025 – Present]
- Worked as a **Data Scientist-PhD** at **ION Trading Pvt Ltd,** Noida, India on chatbot design as an internal tool for finance-related blogs and contracts using LLM [Mar 2025 - Mar 2025]
- Worked as an **AI Analytics Intern (IM - DMZ)** at **Airbus** India Pvt. Ltd. In Bangalore, I worked on a research project to design a deep learning-based novel algorithm for proprietary metal surface defect detection accuracy enhancement. [Aug 2022- Sept 2023]
- Worked as JE (ATM) in Chennai Air Traffic Services department in **Airports Authority of India**, a public sector undertaking. [Oct 2015-Feb 2018]

KEY PROJECTS

- **Geo-Referenced Factor-Graph SLAM for Orchard-Scale 3D Apple Reconstruction and Yield Estimation**
  - A factor-graph based 3D map reconstruction and apple yield estimation in apple orchards
    MDPI Agriculture '26 [Mar' 2026]
- **SEEmear: High-Resolution georeferenced 3D Mapping Methodology for Proximal Monitoring of Permanent Crops**
  - A proximal sensing system integrating stereo cameras , RTK-GNSS, and an IMU on a mobile platform for high-resolution geo-referenced 3D mapping in orchards ***XV SBIAgro '25*** [Dec' 2025]
- **Strategies to overcome barriers to the implementation of Agriculture 4.0 Technologies in the Brazilian Agri-food System** ***MDPI IECF '25*** [Oct' 2025]
  - Survey-based statistical analysis like Cronbach's alpha and comprehensive strategies to overcome challenges in implementation of technologies with farmers in Brazil
- **Aleatoric and Epistemic Uncertainty reduction in the Autoland Neural Network pipeline –** ***IEEE Access*** [May' 2025]
  - Measurement of aleatoric uncertainty by variance calculation and reduction of epistemic uncertainty using ensemble architecture in VLS-FWA Autoland pipeline.
- **VLS-FWA an end-to-end pipeline CNN-based custom regression model -** ***IEEE ICPRS '24*** [Jan' 2024]
  - A vision-based landing system for fixed-wing aircraft estimating the vertical and lateral deviations, the slant distance remaining and the altitude during approach to land.
- **Ambiguous Boundary Uncertainty Reduction in Single Stage Object Detector Models -** ***IEEE CVMI '24*** [Aug' 2022]
  - A novel two-stage and single-stage network-based object detection algorithm for enhancing the metal surface defect localization accuracy.
- **Neural Network Based Landing Assist using Remote Sensing Data -** ***IEEE SITIS '22*** [Apr' 2022]
  - A deep learning network implementation trained on Google Earth Engine satellite image data in a stereo camera setup for the design of landing assist for the pilots and guidance system for the Air Traffic Controller**.**
- **Depth Map refinement using Mask R-CNN and Non-linear order statistic rank filter -** ***Journal SSRN***
  - A **novel** technique to refine the transmission map calculation to reduce the halo artefacts in single image

dehazing for airside application in airports. [Dec' 2021]

- **Real-Time YOLOv7 Based Smart Light Control System -** ***IEEE ICAIGE '23*** [Jul' 2023]
  - A vision-based smart lighting system based on single-stage detectors**.**
- **Rest API using Flask** [Jul' 2023]
  - It utilizes a POST method that takes an RTSP URL and a user-defined polygon that uses a person detection model to detect and count the number of people entering that polygon.
- **Variance Reduced Stochastic Gradient Descent implementation term paper** [Apr'2020]
  - Implemented code of the SGD optimization technique by reducing the variance by combining mini-batches for epochs.

INTERNSHIP EXPERIENCE

Company Name: LogicFruit Technologies Pvt Ltd. [May'15 - July'15]

- Implementation of **low-light image enhancement** techniques such as CLAHE, Multi-scale Retinex on MATLAB

Institute Name: IIT, Hyderabad [May'13 – June'13]

- **Design of an Efficient Baseband Architecture for ZIGBEE** transmitter and receiver 2.4 GHz PHY layer architecture on MATLAB SIMULINK and analysis of performance on passing the signal through AWGN channel
- ASIC implementation: Designed the schematic for Serial to Parallel converter and Half Sine Pulse shaper in the transmitter on Cadence Virtuoso.

TECHNICAL SKILLS

- **Programming Languages:** Python (PyTorch, Numpy, OpenCV), MATLAB (Image Processing and Digital Signal Processing), C, C++
- **Tools:** MATLAB, Simulink, MeshLab (point cloud processing), Google Earth Engine JSON
- **Skills:** MS Excel, MS Word, MS PowerPoint
- **Technical hardware interface:** DSP, Atmega-16, 2560 Microcontroller

RELEVANT COURSES

- Introduction to signal analysis
- Convex Optimization
- Representation and Analysis of Random Signals
- Machine Learning for Signal Processing
- Speech Signal Processing
- Monte Carlo Markov Chain
- Image Processing
- Stochastic Processes
- Statistical Signal Processing
- Mathematical Modelling of Signals

POSITIONS OF RESPONSIBILITY

Tutor and Teaching Assistant, Image Processing and other courses [2019-24]	• Created assignments and propagated on **GitHub** and **conducted written exams** of 50+ undergraduate (UG) Students for **Image Processing (EE604) and Digital Signal Processing (EE301)** courses

CO-CURRICULAR ACTIVITIES

- Obtained 1st prize in Green Scavenger Hunt in Technosearch'12, MANIT, Bhopal.
- Obtained 2nd prize in Circuitous in Technosearch'12, MANIT, Bhopal.
- Secured 4th position "GreenX", Techfest, IIT-BHU, Varanasi.

ADDITIONAL INFORMATION

- **Personal Interests:** Singing Classical music, Playing Badminton, Meditation

REFERENCES

- **Dr. Thiago Santos Teixeira**
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