Construction Information Technology Laboratory
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Alwyn Mathew

Research Associate, University of Cambridge

Work Experience

University of Cambridge, England, United Kingdom — *Feb 2022–present*
Research Associate (Mobile mapping)
Construction Information Technology Laboratory

University of Dundee, *Scotland, United Kingdom* — *Dec 2021–Jan 2022*
Postdoctoral Research Assistant (3D Computer Vision)
Division of Imaging Science and Technology

Education

Indian Institute of Technology (IIT) Patna, *Bihar, India* — *Aug 2021*
Ph.D. in 3D Computer Vision

College of Engineering Karunagappally, *Kerala, India* — *May 2016*
Master of Technology in Image Processing (M.Tech)

Tamilnadu College Of Engineering, *Coimbatore, India* — *April 2012*
Bachelor of Technology in Information Technology (B.Tech)

Skills

Programming	Python, C/C++, Java, ASP.NET, C# .NET
Frameworks	Pytorch, TensorFlow, Keras
Leadership & Management	Co-lead EU projects, grant proposals

Research Interests

Computer Vision, 3D Computer Vision, Robotic Vision
Medical Robotics, Autonomous Robots
Adversarial Machine Learning, Adversarial Attacks

Research Experience

Post-Doctoral Research Experience — ***Cambridge, UK***
PI: Dr. Ioannis Brilakis (University of Cambridge) — *Since Feb 2022*

- *Enhancing an in-house **multi-sensor 3D scanning system** for infrastructure inspection, improving data accuracy and usability.*
- *Engineered and optimized **SLAM** algorithms for real-time navigation and mapping in complex environments.*
- *Developed **construction progress monitoring** from 3D inspection data.*
- *Developed **Scan-to-BIM** software to convert raw scans to digital models.*
- *Developed software to **detect and segment** objects from construction inspection scans.*

Post-Doctoral Research Experience — ***Scotland, UK***
PI: Dr. Luigi Manfredi (University of Dundee) — *Dec 2021 – Jan 2022*

- *Developed real-time **lumen detection** model for autonomous colonoscopy.*
- *Developed **supervised depth estimation** models for endoscopy monocular camera.*
- *Developed self-supervised depth estimation models for **high FOV** endoscopy monocular camera.*
- *Developed expertise in **integrating** deep learning models with soft robot.*
- *Developed expertise in **real time** deep learning models.*

Doctoral Research Experience **Patna, India**
Supervisor: Dr. Jimson Mathew (IIT Patna) *July 2016 – May 2021*

- *Developed expertise in* ***camera models****.*
- *Developed expertise in self-supervised* ***depth estimation*** *from a single camera.*
- *Introduced direct depth estimation with a* ***distorted*** *camera lens.*
- *Studied the impact of* ***self-attention*** *in depth estimation network.*
- *Developed expertise in* ***adversarial samples*** *and their effect on deep neural networks.*
- *Studied the* ***vulnerabilities*** *of monocular depth estimators against Adversarial attacks.*
- *Introduced an intelligent agent for* ***shifting load*** *from no-peak to off-peak hours in residential grids.*
- *Studied the complexity of the RL-DSM environment and improved the learning curve of the agent.*

Experience in Research Guidance **Patna, India**
Indian Institute of Technology Patna *July 2017 – May 2021*

Mentored B.Tech. students in Computer Science Department

- *An advanced reinforcement learning-based system for load shifting in a residential grid.*
- *We developed a reinforcement learning-based system for load shifting in a residential grid.*
- *We developed deep learning-based light-weight object detection for embedded systems.*
- *We have developed a system that estimates depth from a single uncalibrated camera.*

Awards & Achievements

Scholarships & Sponsorship

Sponsorship from ***Scheme for Promotion of Academic and Research Collaboration****, Ministry of Human Resource development, Government of India. Grant #P582.* *April 2020*

Three year ***Senior Research Fellowship*** *(SRF) at IIT Patna, Ministry of Human Resource Development, Government of India.* *April 2018*

Two year ***Junior Research Fellowship*** *(JRF) at IIT Patna, Ministry of Human Resource Development, Government of India.* *July 2016*

Two year ***Post Graduate Fellowship*** *at College of Engineering Karunagappally Institute of Human Resources Development, Government of Kerala.* *July 2014*

Competitive Awards

Second Place*, IoT Grand Challenge, Indian Institute of Technology (IIT) Patna.* *2016*

Finalist*, Bosch DNA Challenge, Bosch India.* *2017*

Top 35*, Patna Ideathon, Government of Bihar.* *2018*

Competitive Examinations

*Graduate Aptitude Test in Engineering (****GATE****)* *2016*
All India Rank: 5493 out of 108495 candidates.

References

Available on request.