Haritha Jayasinghe

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OBJECTIVE

A 3rd year PhD student at the EPSRC FIBE2 CDT, researching 3D modelling and digital twins of industrial infrastructure. I have a strong background in 3D computer vision and deep learning, and am passionate about conducting cutting edge research to contribute to the rapid transformation of our world through computer science. I am self-motivated and capable of adapting to new domains and tackling complex challenges.

RESEARCH INTERESTS

- Computer Vision
- Digital Twins
- 3D Reconstruction
- 3D Data Processing
- Machine Learning / Deep Learning
- Generative Design

TECHNICAL RESEARCH SKILLS

- Deep Learning-Powered Applications for Computer Vision, 3D Point Cloud Processing and geometric modelling
- Experience in PyTorch, TensorFlow, Point Cloud Library (PCL), Python, C++

EDUCATION

PhD in Infrastructure 3D modelling at the EPSRC Centre for Doctoral Training in Future Infrastructure and Built Environment, Department of Engineering, University of Cambridge	**United Kingdom** Sept 2022- Present
Master of Research at the EPSRC Centre for Doctoral Training in Future Infrastructure and Built Environment (FIBE2 CDT), Department of Engineering, University of Cambridge	**United Kingdom** Oct 2021 – Sept 2022
First Class, BSc (Hons) Engineering (Computer Science & Enginering) at the Department of Computer Science & Engineering, University of Moratuwa	**Sri Lanka** Oct 2016 – July 2021
CIMA Advanced Diploma in Management Accounting	**Sri Lanka** Oct 2015 – July 2017

CONFERENCE PUBLICATIONS

- **Towards a Density Preserving Objective Function for Learning on Point Sets**, *European Conference on Computer Vision (ECCV) 2024, Jayasinghe, H. and Brilakis, I.*
- **Learnable Geometry and Connectivity Modelling of BIM Objects,** Oral presentation, *British Machine Vision Conference (BMVC) 2023, Jayasinghe, H. and Brilakis, I.*
- **Topological Relationship Modelling for Industrial Facility Digitisation Using Graph Neural Networks,** *International Conference on Construction Applications of Virtual Reality 2023, Jayasinghe, H. and Brilakis, I.*
- **Data-Driven Simulation of Ride-Hailing Services using Imitation and Reinforcement Learning**, *33rd International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Systems 2021, , Jayasinghe, H., Jayatilaka, T. and Gunawardana, R.*

PROFESSIONAL & TEACHING EXPERIENCE

Supervisor (Part-time)	University of Cambridge	**UK**	Oct 2023 - present
Debate coach - CEM course (part time	University of Cambridge	**UK**	April 2022 - Present
SYNC Cofounding programme	University of Cambridge	**UK**	Dec 2024 - Present
Software Engineer (part-time)	Didimi (Cambridge spin-off startup)	**UK**	April 2024 – Dec 2024
Associate Data Scientist (Part-time)	Veracity AI	**Sri Lanka**	Feb 2020 – Sept 2021
Google Summer of Code Mentor	Point Cloud Library Organisation	**Remote**	Jun 2021 – Aug 2021
Google Summer of Code Intern	Point Cloud Library Organisation	**Remote**	Jun 2020 – Aug 2020
Teaching Assistant (part time)	University of Moratuwa	**Sri Lanka**	Jan 2020 – Present

Research Intern	University of Sydney / CSIRO Data61	**Australia**	Jun 2019 – Dec 2019
Internship in Advertising	Leo Burnett Solutions	**Sri Lanka**	May 2017 – July 2017

COURSES

I have focused on building a multidisciplinary knowledge base, with a strong foundation of computer science, mathematics, machine learning, and deep learning, with courses such as;

- Machine Vision
- Machine Learning
- Data Mining and Information Retrieval
- Calculus for System Modelling
- Intelligent Systems
- Numerical methods for Computer Science
- Probabilistic Machine Learning
- Intelligent systems
- Linear algebra

HONOURS AND AWARDS

- **1st Place – Conference on Everything 2023,** Organised by Churchill College, Cambridge, UK 2023
- **1st Place – Cambridge Climate Hackathon,** Organised by Cambridge Climate Society Cambridge, UK 2023
- **1st Place – CDBB Hacakthon,** Organized by the Center for Digitally Built Britain, UK 2022
- **Most Innovative award, Churchill Enterprise 2022,** Organised by Churchill College, Cambridge, UK 2022
- **First Runners Up, Technology Infusion Grand** Challenge – organized by La Trobe University, Australia 2021
- **1st Place - Code4Good 2019 -** Hackathon on promoting social welfare through ICT, Colombo, Sri Lanka 2019
- **1st place – iHack 2018 -** Island-wide hackathon organized by University of Colombo, Sri Lanka 2018
- **1st runner up - 4IR Hackathon 2018 -** Organized by SLASSCOM and Virtusa, Sri Lanka 2018
- **1st runner up - Unilever Future Leaders League 2017 -** Global Business Case Study Competition, London, UK 2017
- **1st Runners up, Hulftsdorp Inter-university Debating Competition** - Organized by Law College of Sri Lanka. 2017
- **Dean's List Certificate Winner for all 8 Semesters -** Dean's List Certificate is the highest grade that an undergraduate can obtain for the excellence in academic studies in a semester**.** 2016 – 2021

PROJECTS & RESEARCH EXPERIENCE

Geometric Digital twinning of Industrial facilities – University of Cambridge (PhD project) Oct 2021 - Present
3D modelling of geometries from point cloud scans, Construction Information Technology Lab

Vehicle damage detection using Computer Vision / Deep Learning - Veracity AI Sept 2020 – Sept 2021
Worked on Computer Vision based Pipelines for Automated Vehicle Damage Detection.

Building Construction Monitoring Through Point Cloud Processing - Veracity AI Feb 2020 – Sep 2020
Designed algorithms for analysing change detection over time, vertical and horizontal surface analysis, with a focus on scalability across large point clouds, as part of a project for a US-based Civil engineering asset management company.

GPU Accelerated Octree Search Algorithms for Point Cloud Search in PCL - Point Cloud Library May 2020 – Aug 2020
Implemented and modernised octree and other point cloud processing algorithms using C++ and CUDA. The work was supervised by a PhD student from the University of Lisbon. Article published on PCL website - pointclouds.org/gsoc-2020/gpu

Data-Driven Simulation of Sharing Economies Using Deep Reinforcement Learning - University of Moratuwa Mar 2020 – May 2021
Worked on digital simulations of shared economies (specifically ride-hailing platforms) using deep Q-learning with TensorFlow & SimPy.

Tile-based 360-degree Video Streaming on Mobile Devices - University of Sydney Sep 2019 – Dec 2019
Research and development of novel video 360-degree video streaming methods utilizing variable quality options, using Android Studio and OpenGL.

Privacy Leakage Detection through Point Cloud Data in Mixed Reality Devices - University of Sydney / CSIRO Data61 Jun 2019 – Sep 2019
Investigated the impact of privacy leakage through point cloud data using Deep neural networks such as PointNet.

LEADERSHIP & SERVICE ACTIVITIES

- **Computing Officer –** Churchill College MCR 2023-2024
- **Committee Member –** Cambridge Existential Risks Initiative 2023
- **Debate Adjudicator –** Cambridge Union 2023
- **Captain –**University of Moratuwa Debate Team & DS Senanayake College Debate Team 2018-2021, 2013-2014
- **Debating Coach –** DS Senanayake College School Debate Team 2018 - 2021
- **Student Coordinator for Sri Lanka** – South Asia Students for Liberty 2017 - 2018
- **Organizer / Chair -** Sri Lanka Model United Nations Conference 2016