

Dr Akanda Ashraf

Machine Learning and Computer Vision Leader; 3D LiDAR Perception

Dhaka, Bangladesh (fully remote; works UK and US hours) | akandaashraf.com | akanda@akandaashraf.com | linkedin.com/in/akandaashraf | github.com/AkandaAshraf

PROFESSIONAL SUMMARY

Machine learning leader who takes perception research into deployed products. Currently Lead Perception Engineer at Metrolla, responsible for the real-time, edge-native 3D LiDAR perception platform behind people and vehicle tracking, counting and area analytics. Previously Technical Lead for Machine Learning at Cron AI, running the machine learning function for the senseEDGE 3D perception platform. PhD in Artificial Intelligence; first-named inventor on granted UK patent GB2622032, the technology behind the UK's National Footwear Service, used by 32 police forces; research cited more than 130 times. Has led internationally distributed teams entirely remotely since 2023, across UK and US time zones.

EXPERIENCE

Lead Perception Engineer, Metrolla (Seattle area, USA; remote; contract) May 2026 - Present

- Lead development of Metrolla's real-time, edge-native 3D LiDAR perception platform for people and vehicle tracking, counting and area analytics, from research prototype to deployed product.
- Own the perception pipeline end to end: sensor integration and fusion across multiple LiDAR vendors, 3D object detection, multi-object tracking (probabilistic data association with belief-propagation and Kalman-filter components) and scene understanding.
- Designed the validation programme that qualifies manual observation as a reference standard for automated occupancy and throughput measurement, with acceptance criteria drawn from measurement system analysis.
- Author the technical protocols and progress reports that keep engineering and business stakeholders aligned.

Deep Learning and AI Consultant, Invento Software Limited (Dhaka; freelance) Feb 2026 - Present

- Leading Invento's transition from enterprise software to AI-native systems, embedding predictive intelligence into its ERP and CRM platforms.

Technical Lead, Machine Learning, Cron AI (London, UK; remote) May 2023 - Dec 2025

- Ran the machine learning function for senseEDGE, Cron AI's edge-native 3D LiDAR perception platform, which turns raw LiDAR data into real-time object detection, classification and tracking across diverse sensors and field conditions.
- Led model training, testing and release across the perception stack; fine-tuned and released models for production accuracy and reliability.
- Implemented new features and ran architecture searches to improve model performance.
- Delivered the function remotely for the London-headquartered team.

Machine Learning Scientist; Consultant (Apr - May 2023), Bluestar Software Ltd (UK) Mar 2022 - May 2023

- Led AI and deep learning initiatives for criminal justice and law enforcement systems in the UK and international jurisdictions.
- Architected and deployed production machine learning pipelines using transformer, convolutional and recurrent architectures; implemented multimodal learning across text, audio, image and structured data.
- Led development with large language models for legal and forensic text analytics, case summarisation and decision support; developed speech-to-text systems; designed computer vision re-identification systems using metric learning and similarity search.
- Secured an Innovate UK Knowledge Transfer Partnership grant (2022 to 2023, round 2); supervised and mentored PhD researchers and engineers.

Computer Vision and Deep Learning Engineer (KTP Associate), Bournemouth University with Bluestar Software Ltd (UK) Sep 2019 - Feb 2022

- Built the majority of the deep learning architecture behind the automated footwear-identification technology now used in the UK's National Footwear Service, operated on behalf of the Home Office and used by 32 police forces across the UK, and guided its transition from R&D into an operational platform (Innovate UK KTP011600).
- First-named inventor on the resulting granted UK patent GB2622032 and PCT publication WO2024/047325; underlying research published in Applied Soft Computing (2021).

Earlier roles, Bournemouth University; United International University 2013 - 2018

- Research assistant, course demonstrator and programming support, Bournemouth University (2016 to 2018); undergraduate teaching assistant, United International University (2013 to 2014).

EDUCATION

PhD, Artificial Intelligence, Bournemouth University (complex networks, deep learning, graph theory) 2016 - 2020

- Fully funded doctoral scholarship. Thesis: Prediction and modelling of complex social networks and their evolution; introduced a physics-inspired method for link prediction, since taken up in graph neural network research.

MRes, Statistics, Bournemouth University (time-series modelling and causality analysis) 2015 - 2016

- Erasmus Mundus scholarship. Thesis: Detection and analysis of the causal relation between tourism and greenhouse gas emission.

BSc, Computer Science and Engineering, United International University, Dhaka (GPA 3.78/4.00, first class) 2010 - 2014

SKILLS

Perception: 3D LiDAR perception, point cloud processing, 3D object detection, multi-object tracking, sensor fusion and integration, scene understanding, people and vehicle counting, edge AI, real-time systems

Machine learning: deep learning, computer vision, probabilistic graphical models, Kalman filtering, large language models, natural language processing, speech-to-text, graph neural networks, time-series and causal analysis, MLOps and model release

Method: measurement system analysis, design of experiments, statistics, technical writing

Leadership: technical strategy and architecture, team building and mentoring, engineering standards, end-to-end delivery, remote distributed teams across UK and US time zones

Tools: Python, PyTorch, TensorFlow, Keras, ROS 2, Docker, R, LaTeX

Languages: English (native or bilingual proficiency); Bangla (native)

PATENTS

- GB2622032, Automated footwear identification system and method; granted 17 September 2024; first-named inventor; assignee Bluestar Software Limited. International publication WO2024/047325 (PCT/GB2023/052163), 7 March 2024.

SELECTED PUBLICATIONS

Publishes as Akanda Wahid-Ul-Ashraf; cited more than 130 times.

- How to predict social relationships: physics-inspired approach to link prediction. Physica A: Statistical Mechanics and its Applications, 2019.
- Deep multilabel CNN for forensic footwear impression descriptor identification. Applied Soft Computing, 2021.
- Deep learning enabled fall detection exploiting gait analysis. 44th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), 2022.
- Newton's gravitational law for link prediction in social networks. Complex Networks and Their Applications VI (COMPLEX NETWORKS 2017), Springer, pp. 93-104.
- NetSim: the framework for complex network generator. Procedia Computer Science, 2018.

GRANTS AND SCHOLARSHIPS

- Innovate UK Knowledge Transfer Partnership grant, 2022 to 2023 round 2, Bournemouth University and Bluestar Software Limited.
- Fully funded doctoral scholarship, Bournemouth University; Erasmus Mundus scholarship for the MRes.

OPEN SOURCE

- akanda-method: gravity-inspired link prediction library from the PhD research; MIT-licensed, pip-installable, GPU-accelerated.
- Detection of causal variables in large dynamical systems: neural-network method with paper, code and pre-registrations (CC BY).
- DeepFeatSelection: learnable feature gates and masked-autoencoder representations for feature selection in large time-series systems.