

Grant Stevens

Machine Learning Researcher

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SUMMARY

I am currently an EPSRC Doctoral Prize Fellow at the University of Bristol. I specialise in machine learning techniques applied to astronomical data, with a focus on improving active learning performance and exploring the utility of weak supervision. My work has enabled me to be involved and consult in the morphology classification pipeline of the recently launched ESA telescope Euclid.

SKILLS

Research: Active Learning, Weak Supervision, Computer Vision, Generative Models, Interactive Software Development.

	Proficient:	Experience with:
Languages:	Python	C++, CUDA, BASH.
Technologies:	PyTorch, SKLearn.	PyBind, Tensorflow.

EDUCATION

EPSRC Doctoral Prize Fellow School of Physics, University of Bristol <i>From Noise to Knowledge: Harnessing Diffusion Models for Digital Twin Calibration</i> <ul style="list-style-type: none">• Diffusion Models• Generative Models• Simulation-Based Inference• Digital Twins• Simulation Parameter Estimation• Simulation Calibration	Jun 2024 – Jun 2026
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Interactive Artificial Intelligence, PhD School of Computer Science, University of Bristol <i>Improving The Practicality of Active Learning Pipelines in Real-World Problem Settings : A Case Study in The Classification of Astronomical Data</i> <ul style="list-style-type: none">• Active Learning• Weak Supervision• Computer Vision• Interactive Software Development• ML for Real World Data• Multimodal Learning• Human-in-the-Loop ML• Crowdsourced Labels• Galaxy Classification	Sep 2019 – May 2024
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Computer Science, MEng School of Computer Science, University of Bristol <ul style="list-style-type: none">• Programming & Algorithms• Machine Learning• Deep Learning• Software Engineering• Computer Architecture• Systems Security• Computer Graphics• 3D Modelling & Animation• Web Technologies	Sep 2015 – Jul 2019
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SELECTED PUBLICATIONS

- [1] G. Stevens et al. "AstronomicAL: an interactive dashboard for visualisation, integration and classification of data with Active Learning". In: *Journal of Open Source Software* 6.65 (Sept. 2021), p. 3635. DOI: 10.21105/joss.03635.
- [2] G. Stevens et al. *Euclid Quick Data Release (Q1). Active galactic nuclei identification using diffusion-based inpainting of Euclid VIS images*. 2025. eprint: 2503.15321.
- [3] B. Aussel et al. "Euclid preparation-XLIII. Measuring detailed galaxy morphologies for Euclid with machine learning". In: *Astronomy & Astrophysics* 689 (2024), A274. DOI: 10.1051/0004-6361/202449609.
- [4] R. Desmond Nzoyem et al. "Towards Foundational Models for Dynamical System Reconstruction: Hierarchical Meta-Learning via Mixture of Experts". In: *First Workshop on Scalable Optimization for Efficient and Adaptive Foundation Models, ICLR 2025*.
- [5] T. Matamoro Zatarain et al. *Euclid Quick Data Release (Q1). The active galaxies of Euclid*. 2025. eprint: 2503.15320.
- [6] M. Siudek et al. *Euclid Quick Data Release (Q1) Exploring galaxy properties with a multi-modal foundation model*. 2025. eprint: 2503.15312.
- [7] R. Green et al. *Time-Series Classification for Dynamic Strategies in Multi-Step Forecasting*. 2024. eprint: 2402.08373.
- [8] R. Green et al. *Stratify: Unifying Multi-Step Forecasting Strategies*. 2024. eprint: 2412.20510.

EXPERIENCE

AI Research Engineer Imagination Technologies During this 6-month internship, I worked on creating custom CUDA implementations for Deep Learning Inference on high sparsity data. My novel implementation of sparse convolutions can compete with SOTA latency on LiDAR classification networks. The code has been developed to be able to run on any general-purpose hardware. The project has since been submitted for five patents. C++ CUDA Python PyTorch PyBind	Jun 2022 – Dec 2022
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PATENTS

- **GB2623140** - *Methods and systems for performing a sparse submanifold convolution using an nna*
- **GB2627804** - *Methods and systems for performing a sparse submanifold convolution on a gpu*
- **GB2627805** - *Methods and systems for performing a standard convolution on a gpu*
- **GB2627806** - *Methods and systems for performing a standard deconvolution on a gpu*
- **GB2627807** - *Methods and systems for performing a sparse submanifold deconvolution on a gpu*

PROJECTS

AstronomicAL: Interactive dashboard for visualisation, integration and classification of data with Active Learning

Developed as part of my PhD

AstronomicAL is a human-in-the-loop interactive labelling and training dashboard that allows users to create reliable datasets and robust classifiers using active learning. The system enables researchers to visualise and integrate data from different sources and deal with incorrect or missing labels and imbalanced class sizes by using active learning to help the user focus on correcting the labels of a few key examples. Although showcased with an astronomy use case, the dashboard has been designed to be easily adaptable to any domain and datasets. AstronomicAL enables experts to take full advantage of the benefits of active learning: high accuracy models using just a fraction of the total data, without the requirement of being well versed in underlying libraries.

Python Javascript | PyTorch SKLearn Holoviews Bokeh

Passive Information Extraction System (P.I.E.S)

Interactive AI Group Project - Developed for L.V. Insurance

Our team developed a backend question-answering system for L.V. to support service desk staff by extracting relevant information from live customer call transcripts. This allows operators to focus on the customer rather than data entry. The system processes conversations in real time, auto-filling records while allowing verification by the call handler to ensure accuracy. It uses a BERT model trained on SQuAD, with each call contributing to a growing, labelled dataset tailored to company needs. With thousands of weekly calls, the model can be routinely retrained to maintain high performance.

Python | PyTorch

Multiplayer Rhythm-Based Dungeon Crawler

Games Project - Awarded Best 3rd Year Group Project

For a 3rd Year group project, we created a game called Rave Cave. It is a multiplayer rhythm-based dungeon crawler where large amounts of players rock out simultaneously in time to the music. Players must cooperate with their team to solve puzzles and complete complex button sequences - all in time to the beat of the music. We created our own game engine in C++ by integrating our custom code with external libraries.

C++ | SFML Irrlicht GLM Anax

TEACHING EXPERIENCE

Stars & Planets (PHYS10600) Guest Lecture - AI with Astronomy	2024/2025
Interactive AI Group Project (COMSM0087) Guest Lecture - MLOps & Kubeflow	2021/2022
Artificial Intelligence (COMS30014) Teaching Assistant	2021/2022
Introduction to AI (EMATM0044) Teaching Assistant	2021/2022
Interactive AI Group Project (COMSM0087) Guest Lecture - MLOps & Kubeflow	2020/2021
Machine Learning (COMS30007) Teaching Assistant	2019/2020
Symbols, Patterns & Signals (COMS21202) Teaching Assistant	2018/2019

TALKS

2025-06-24: AIMLAC CDT Conference on Artificial Intelligence - University of Bristol :*"The Impracticalities of ML Pipelines with Scientific Data: Constraints, Assumptions and Complexity"* (invited)

2025-06-18: School of Physics AI and HPC Seminar - University of Bristol :*"Doing more with less: AI for Sparse, Noisy, and Unlabeled Data"* (invited)

2025-06-10: Scientific ML across the Faculty of Science and Engineering Workshop - University of Bristol :*"Improving The Practicality of Active Learning Pipelines in Real-World Problem Settings"*

2025-03-17: The Alan Turing Institute, AI UK Conference - Queen Elizabeth II Centre, London :*"Interactive AI-powered spatial and multimodal data explorer - Booth"* (invited)

2024-10-18: AI Lunch & Learn Seminar - University of Bristol :*"Speeding up Sparse Convolutions: Placement Experience"* (invited)

2024-02-15: Galaxies & AGN with the First Euclid Data and Beyond - University of Bologna :*"Using the QUEST Active Learning Strategy for Efficient Classification and Labeling in Large Datasets"*

2023-03-28: Interactive AI CDT Spring Research Conference - University of Bristol :*"QUEST: QUerying Embedding Spaces through Tessellations"*

2023-02-08: School of Physics Developer Group Seminar - University of Bristol :*"Speeding up Sparse Convolutions: Placement Experience"* (invited)

2022-04-27: Euclid Consortium Annual Meeting 2022 - Oslo, Norway :*"Using active learning to create reliable and robust classifiers for Astronomy"*

2022-03-30: Interactive AI CDT Research Showcase - University of Bristol :*"Using active learning to create reliable and robust classifiers for Astronomy"*

2021-12-16: Euclid Consortium UK Annual Meeting 2021 - Online :*"Using active learning to create reliable and robust classifiers for Euclid"*

CONFERENCES

Simulation Based Inference for Galaxy Evolution 2025 LOC	May 2025
Euclid Legacy Science Advanced analysis tools (ELSA) Meeting LOC	Jan 2025
Simulation Based Inference for Galaxy Evolution 2024 LOC	Apr 2024
Bristol Interactive AI Symposium (BIAS) 23 Planning Group and Organisation Committee	Sep 2023

COLLABORATIONS

Member of Euclid Consortium
Co-Lead of Morphology for AGN Detection Group within Euclid Consortium
Led Machine Learning Journal Club within Astronomy Group
Mentored Masters, PhD and PostDoc students