

JESS JONES

20 Brunswick Street, Bristol, BS5 9QN
07876116588
jess.jones@bristol.ac.uk

PROFILE

PhD candidate for Robotics and Autonomous Systems at the University of Bristol with a First Class Degree in Computer Science. Jess is a tenacious and hard-working individual with extensive leadership experience at start-up and medium enterprise scale.
In pursuit of diverse opportunities in the application of deep-learning, multi-agent reinforcement learning, and vision-based computing to support both the scientific process, and as a driver of technological change.

RELEVANT EDUCATION

PhD Robotics & Autonomous Systems
University of Bristol | Sept. 2023 - Sept. 2027

Computer Science BSc. (First Class)
University of Bristol | 2020 - 2023

RELATED WORK EXPERIENCE

Developer & Researcher
CASM Technology | Feb 2024 - Present
- Development and research of tools which leverage Foundation Models, Deep-Learning, and other Machine Learning paradigms to support the analysis of social media with respect to the identification of misinformation and hateful content.

Full-stack software engineer
Motion Impossible | May 2023 - Sept 2023
- Designed the architecture and user interface of a system to enable simultaneous control and interaction of multiple robotic camera dollies.
- Implementation of communication network to facilitate one-to-one, one-to-many, and many-to-many control-device interactions.

Research Intern
Bristol High Performance Computing Group | Summer 2022 (8 weeks)
- Benchmarking MGCFD-OP2, an unstructured multi-grid computational fluid dynamics mini application, across various Arm-based architectures: ThunderX2, Graviton 2 and Graviton 3.
- Development and release of two packages to the Spack public repository: mgcfd-op2 and babelstream.

Developer & Researcher
CASM Technology | Summers 2020 & 2021
- Providing support for PhD level research in the field of natural language processing.
- Development of a customised entity linking component within an automated fact-checking system.
- Researcher for UK Cabinet Office report into state of the art technologies targeted at improving operational delivery.

OTHER NOTEABLE EXPERIENCE

Owner & Director
Herb & Bloom | 2017 - 2019
- Indoor vertical farming start-up.
- Responsible for all aspects of establishing, operating and managing a start-up PLC.

Operations Director
Cubitt House | 2014 - 2017
- Five site premium pub & hotel group with a £14m turnover.
- Responsible for operational delivery across the group, including site & management performance, procurement, and strategic planning.

AWARDS

Hargrave Prize
August 2023
Established in 2013/2014, the Hargrave Scholarship for Academic Achievement was set up to recognise and celebrate outstanding students on the BSc Computer Science programme. This prize is awarded to one final year Computer Science BSc student for the best final year thesis project.

NAG HPC Student Prize
July 2023
Awarded for second highest accreditation from the University of Bristol High Performance Computing programme 2023.

Netcraft Prize
July 2022
Awarded to the top 10 second-year Computer Science students at the University of Bristol 2022.

PUBLICATIONS & ACADEMIC WORK

Assessing VLM-Driven Semantic Affordance Inference for Non-Humanoid Robot Morphologies DOI:10.65109/WTKR8312
This AAMAS 2026 paper assesses the zero-shot affordance inference capabilities of Vision-Language Models (VLMs) specifically for non-humanoid robots.

- Demonstrates the limitations and capabilities of large foundation models to infer affordances in the context of non-humanoid robotics.
- Identifies a inherent conservative bias in model inference, an important observation for systems design and operational safety.

A MARL Framework for Learning Abstract Communications with Swarms of DOTS (Python)
Sept 2024
Exploratory work during the taught component of the FARSCOPE CDT, building a simulation framework for running efficient MARL experiments for the Bristol swarm-group's DOTS robots.

- Developed a novel multi-agent scenario in which agents must learn to correctly mix paint colours based on communication accuracy and interpretation.
- Evaluated a broad range of MARL algorithms and deep learning networks across the scenario.

3D Individual Corallite Reconstruction via Volumetric Vision-Transformers and Topological Loss (Python)
May 2023
BSc thesis supervised by Dr. Tilo Burghardt, presenting a novel approach to 3D corallite reconstruction. Awarded Hargrave Prize for best undergraduate thesis.

- Deep-learning pipeline which employs a UNet-ViT architecture, accepting volumetric inputs to generate a segmentation volume of corallite regions from micro-CT scans of coral colonies.
- Creation of a novel, custom topological-based loss function to support domain specific segmentation, and consistent segmentation geometry.
- Development of a fully automated system, using the Blender API to convert the segmentation volume into interactive 3D object data, for structural analysis of individual corallites.

High Performance Computing (C/C++/OpenCL)
May 2023
Development and evaluation of a variety of distributed optimisations of the Lattice-Boltzmann method for computational-fluid dynamics problems. Awarded NAG HPC Student Prize for second highest accreditation.

- Serial, architecture-specific optimisations, including memory allocation and corresponding vectorisation directives.
- OpenMP and MPI implementations for elastic scaling across multi-node, multi-thread systems.
- OpenCL implementation for computational offloading to GPUs.

Image Processing & Computer Vision (Python)
Dec 2022
Awarded 83% for two 1.5 week deliverables:

- 3D reconstruction from stereo vision. Exploratory project using epipolar geometry to reconstruct spheres from two stereo images.
- Object detection task to identify no entry signs across a set of image inputs. Solution leveraged classic image processing techniques such as Hough detection and HSV conversion, integrated with a YOLO detection pipeline.

Graphics Engine (C++)
Dec 2022
Awarded 85% for a built-from-scratch ray-tracing graphics engine. Including advanced features such as parallax occlusion mapping, ambient occlusion, soft shadows, Fresnel equations, and the use of distributed ray tracing for rough surface reflections.

SCaRF Application (C#)
June 2022
Awarded 80% for the development of an application for the Skin Cancer Research Fund.

- Prototype mobile application providing the means for a patient to track the development of moles over time and share with their clinician.
- 3D body-model and mole positioning system to pinpoint mole location accurately.
- Assisted photography guides and image ghosting to aid image repeatability.

TECHNICAL SKILLS

Languages
C, C++, C#, Python, Java, Go, Haskell, SQL.

Tools
PyTorch, TensorFlow, OpenMP, MPI, OpenCL, AWS (Cloud), Git, Unity, Unreal Engine.

CORE SKILLS

- A diverse professional background has cultivated a creative and adaptable approach to problem solving.
- Curiosity and an interest in exploring new spaces has led to a varied research background, and the development of a strong technical skill set.
- Leadership training and experience has driven an approach to teamwork centered around inclusivity and empowerment.

REFERENCES

Sabine Hauert, OBE
Professor
PhD Supervisor
sabine.hauert@bristol.ac.uk

David Weir
Director CASM Technology
Employer
davidw@casmtechnology.com