Giles Billenness

Machine learning researcher & Software Developer

Contact Info

Address:
78 St Stephens Road, Hounslow, Middlesex, TW3 2BN

Phone:
07934335265

Email:
giles.billenness@blueyonder.co.uk

LinkedIn:
linkedin.com/in/giles-billenness

GitHub:
github.com/giles-billenness

Skills

Familiar with:
Web: HTML, CSS & Sass, JavaScript, PHP, MySQL, MongoDB, Ruby on Rails, Flask, React & Carbon, GraphQL

Standard OOP: C++, Python, Java & Android Development, Golang, R

Functional: Haskell & Prolog

DevOps: Jenkins, Tekton, Ansible, SonarQube

Testing: JUnit & Cucumber

Machine learning: TensorFlow, Keras, Pytorch, spaCy, CNN, Transformers, Faster-RCNN

Research skills: a proven ability to work harmoniously within a team on research projects, with a knack for analysing and evaluating appropriate research literature and experience using HPC clusters

Other:
Git & GitHub,
API's & JSON,
Docker & Kubernetes,
Arduino boards – Uno & Assembly,
Raspberry Pi,
Fortran

Developing experience in: NodeJS

Hobbies

Team-based video games, tech & computer hardware, machine learning, quantum physics and cooking.

References

References are available on request.

Profile

An independent and adaptable machine learning researcher (UCL) looking for a position in machine vision research, who achieved the highest grade out of a cohort of 190 students. With professional and academic experience in Front & backend development, DevOps, leadership and machine learning research for computer vision. With a particular interest in the research, application, and design of Machine Learning systems to solve real-world issues, following a final year project which involved the application of vision transformers on large-scale medical data. The project achieved significant results showing transfer learning from a different domain improved the viability of diagnosing systemic conditions.

Education

Data Science and Machine Learning MSc, UCL, London Sep, 2023 – Nov, 2024
Expected: (Distinction), Modules:
MSc Project: under the supervision of Professor Pearse Keane (Keane AI Group) and Yukun Zhou at the UCL Institute of Ophthalmology, predicting ischemic stroke within a 5-year window from retinal imaging (ViT) and text data with multi-modal and fusion-based approaches. Current member of the research group. **(Writing for publication)**

Statistical Natural Language Processing – (85%): Improved C++ code generation in Large Language Models by leveraging compiler feedback and Direct Preference Optimization, achieving significant gains in compilation success. **(Writing for publication)**
Applied Deep Learning – (78.1%): Explored self-supervised learning for semantic segmentation using the MaskContrast approach, compared with supervised SegNet, on the iNaturalist and Oxford-IIIT Pet datasets.
Engineering for Data Analysis 1 – (84.3%): Developed a scalable ML pipeline in Ansible to predict 3D protein structures using distributed cloud (AWS), integrating 2 models.
Artificial Intelligence for Biomedicine and Healthcare – (76.6%)
Applied Machine Learning – (100%)

Computer Science BSc, University of Surrey, Guildford Sep, 2018 – Jun, 2022
Achieved First class honours (85%)
Final year dissertation (84%): 'Self-supervised transformers for the downstream classification of diverse systemic conditions', supervised by Professor H Lilian Tang.
I experimented with unsupervised and transfer learning with vision transformers, specifically the Swin Transformer, for diagnosing systemic medical conditions using retinal (fundus) images. The data used for this project was sourced from large-scale, real-world public datasets (EyePACS and the UK biobank). One of the models created during the project achieved equivalent performance to previous industry-standard research in the diabetic retinopathy grading task using a significantly smaller image size. This project also proved that the task of medical diagnosis from retinal images can be done, and with fewer computational resources than previously thought, with reasonable accuracy (to detect dementia, hypertension, and renal issues), as useful knowledge can be transferred from domains with an abundance of data (ImageNet or EyePACS) to domains with limited samples. Finally, the model's retinal focus points aligned with past theoretical research, showing that those areas have the potential for further research to discover biomarkers for disease. These focus points were identified using class activation mapping with the attention layers of the architecture. Processing for this project was done using Surrey's HPC AI cluster, with jobs scheduled using HTCondor.

Relevant modules:
Deep learning and advanced AI (year 3) (80%, highest in the year):
Our team experimented with and evaluated several state-of-the-art object detection methodologies (Faster-RCNN with Resnet50, Faster-RCNN with Swin transformer, YOLO with DarkNet53, and DETR with Resnet50) for the identification and segmentation of European road signs using the Mapillary traffic sign dataset. This project was done in Python using the MMCV framework. This project developed my knowledge and ability to research and evaluate current object detection architectures to work with large-scale data. Processing for this project was done using Google Cloud.

Computational Intelligence (year 3) (97%):
The first part of this project was to solve a multi-objective optimisation problem implementing the elitist non-dominated sorting genetic algorithm (NSGA-II). Then, using this genetic algorithm to train a feed-forward multi-layer perceptron network to approximate a function. This project was done in Python using the DEAP framework. This project developed my knowledge and ability to use a range of machine learning paradigms to solve a problem.

Natural Language Processing (NLP) (year 3) (83%):
For the first part of this project, I individually experimented with and evaluated Deep Neural networks and Transformers for name entity recognition (NER).
For the second part, our team created a chatbot for customers to create and manage bookings with a local cinema. We hosted the chatbot using a custom web service.
We did this project in Python, SpaCy, and Flask. This project developed my knowledge and ability to utilise machine learning for NLP tasks.
More information and projects on GitHub and my website (on GitHub).

Employment History

Software Developer at IBM International, Sep, 2022 – Present
Graduate training project: In a team of other graduates, we developed an API for a sample banking application to add open banking functionality (PSD2) in Java Springboot deployed in IBM WebSphere Liberty, with its own CI/CD pipeline in Tekton, utilising an interactive web app made using react.
I am currently working in the ZaaS (IBM Z as a service) SRE team on IBM Z features and tooling in IBM cloud.
Responsible for updating and configuring devices in our service, responding to incidents, and developing internal tooling in NodeJS and Python.
Member of the machine learning reading group, reading papers and attending talks from companies and researchers.
Returning member of previous patent group.
On leave to complete machine learning masters. Role change to watsonx Code Assistant LLM team, effective start of 2024.

Software Developer placement at IBM Southbank, Jul, 2020 – Sep, 2021
I took on DevOps, QA Automation Testing and Development roles, where I gained knowledge in industry-standard technology.
- In DevOps, I created custom tooling for the teams on location, learning Golang and using both GitHub & pipeline APIs.
- In QA automation, I extended their tests and data collection using the Kubernetes API.
- In Development, I created React components, GraphQL endpoints and refactored our repository to remove all bugs, security issues, and improved code quality (Smell).

I also took part in give back opportunities and hackathons, such as:
- Receiving Second place in the IBM Green hackathon.
- Submitting 4 patents through the patent scheme, that I developed in collaboration with IBM employees from a diverse range of teams.
- Being a representative for IBM at The University of Surrey - Giving talks, hosting a virtual stand at the careers fair and giving CV & application advice.

PALS Lab Demonstrator at The University of Surrey, Oct, 2019 – Jun, 2020
Assisting first-year Computer Science students during their computing labs. Working with lecturers, communicating advice, and supporting students with their work and understanding.

Honours & Awards

The Department of Computing Prize for best performance, The University of Surrey, Jul, 2022
- Received the award (£250) for the highest overall performance in any department programme out of a cohort of 190 students, from the Department of Computer Science.

Professional Training Award - Highly Commended, The University of Surrey, Apr, 2022
- Received the Professional Training Award – Trailblazer – Highly Commended, for performance during the professional training year from the Department of Employability and Careers.

IBM Green Hackathon, 2nd place, IBM Southbank, Feb, 2021
- For developing a carbon emissions product scanner, demo and presentation, in an undergraduate placement team.

Publications

Published/Filed Patents:
- Browser Platform for Self-Hosting A Web Service, IBM, Jul 12, 2023
- Polarisation Multiplexing in Wi-Fi networks to Increase Bandwidth, IBM, May 24, 2022
- Encryption of IP Addresses Using DNS for Obscuring Hosts in the Prevention of DDOS Attacks, IBM, May 12, 2022
- Reverse Charging Packets for Internet Usage, IBM, Apr 19, 2022

Extra-Curricular Activities

President & Industrial Coordinator of the Computing Society at The University of Surrey, Jun, 2019 – Jun, 2021
A leadership role engaged in event management for students in the field of computing.
During my time as President:
I've chaired meetings, lead my committee to plan and execute events and formed industrial relationships, such as
- Collaborating with Microsoft on improving the university's IT functionality.
- Increasing the active members to 150, an increase of ~30% on the previous year.
- My team and I hosted charitable events throughout the year and donated proceeds of ~£200 to One Laptop per Child
- In collaboration with other societies, we hosted a social event and donated proceeds of ~£700 to SATRO

As the Industrial Coordinator:
I engaged in collaboration with external companies, organising a panel with Intel to provide students with CV and career advice.

Course Representative at The University of Surrey, Sep, 2019 – Jun, 2021
This involved liaising with the head staff of the computer science department ensuring that students' opinions about the course are heard and changes are made to reflect the desires of the student body.

Competed in the NSE and NUEL at The University of Surrey, 2018/19
I represented my university in the NSE and NUEL E-sports leagues.

Mission Discovery Space & STEM Summer School at ISSET, KCL, 2016/17
Collaborated with a team to create a unique experiment and present it to a panel of experts at KCL so it could be sent to the international space station. I competed twice, in 2016 and 2017.

Participated in IBM's Quantum Experience, London May, 2016
I used a set of IBM's quantum processors (five-qubit) and matching simulator, interacting through the quantum composer.