JOE BADGER

joe.badger@hotmail.co.uk 07833340049

Education

University of Bath 2019-2024

- **MSc Computer Science**
  Predicted Grade: Distinction

- **BEng (Hons) Civil Engineering with year-long work placement**
  Grade: First Class Honours

Stewart's Melville College, Edinburgh, Scotland 2006-2019

- **Advanced Highers (A*A*A)** Mathematics, Mathematics of Mechanics, Physics
- **Highers (A*A*A*A*A)** Mathematics, Physics, Latin, Geography, English
- **National 5 (6A* and 2A)** Mathematics, Physics, German, Product Design

Technical Skills

Python Proficient in Python after completing the 'Learn Python 3' course on Codecademy. During my industrial placement, I created a Python script to improve data entry efficiency for large-scale bridge modelling. I also developed scripts to calculate complex and iterative engineering calculations during my undergraduate degree. I also developed simple machine learning models using Python during the 'Data Science Career Path' course described below.

C# I am experienced with C# language and coding patterns. After completing the 'Learn C#' course on Codecademy, I completed a 12-week summer internship as a software engineer, in which I used C# to develop a production-ready Blazor web application.

C++ I have used C++ to program Arduinos and other microcontrollers as part of my undergraduate dissertation project.

Blazor After completing the 'Blazor: Getting Started' course on Pluralsight, I gained experience developing a Blazor Web Server Application as part of a summer internship. This project is described in more detail below.

ASP.Net Self-taught the basics of ASP.Net and have built some simple MVC applications.

Django Using William S. Vincent's book 'Django for professionals' I taught myself how to use Django as a framework to create web applications. This included creating a website and database for a bookshop.

Data Science Three weeks completing the Codecademy 'Data Science Career Path' course which included Python, SQL, NumPy, Pandas, data visualisation, natural language processing, and machine learning. This valuable course taught me the basics of data science and analytics.

HTML + CSS I have a great understanding of HTML and CSS after building and designing multiple front-end web applications. I also have experience with TailwindCSS, which is a utility-first CSS framework.

SQL Proficient understanding of SQL and SQLite3. I created a simple relational database model of flight information and created a python program to query/add/delete/update the database.

Work Experience

Software Engineer Summer Internship

Jun 2023-Sep 2023

- Worked at System C Healthcare Ltd (www.systemc.com) as a software engineer. Collaborated with both the Systems Interoperability and Research & Development departments.
- Within Systems Interoperability, I worked as part of a SCRUM team to fix bugs in the client interface.
- Worked with R+D to develop a Blazor web application This is a tool to assist the customer support team. More detail below.
- Responsible for developing the front and back end of the web app, which connected to a web service that was built by the lead engineer.
- Met the requirements of the support team and the specification set out by the lead engineer.

Year-long Industrial Placement

Aug 2021-Jul 2022

- Worked at Rendel Ltd (www.rendel-ltd.com) as an undergraduate civil engineer. Worked as part of the bridges team, most of the year working on the category three checks of the viaducts that are being built for the HS2 Project.
- This role involved creating 3D models of the bridges for Finite Element Analysis, using Excel spreadsheets to analyse, and perform calculations on structural members and writing Python scripts that would help to input thousands of rows of data into modelling software.

Projects

Blazor web application support tool

This project aimed to build a web application that would assist the customer support team. System C provides health information technology systems and services to the NHS and social care. One of their services stores and manages patient and baby data for maternity and neonatal care. When the users of this service encounter problems, they can call System C, and the support team can help to diagnose the issue. This web app aims to create a more functional and user-friendly tool to help the support team fix problems quickly. Blazor was used as the framework for this project due to its ability to create dynamic web applications using only C# and HTML. Another benefit of Blazor is being able to design generic components, which can be used throughout the project, which means it is very quick to implement new functionality. The front end was styled using Tailwind CSS, which is a utility-first CSS framework.

Development of a low-cost water level gauge – Undergraduate Dissertation

This research paper aims to investigate the potential for low-cost water level gauges and compare their accuracy to similar existing gauges. Using an ESP32-CAM, Arduino, and ultrasonic sensor, two different gauges were developed using the Arduino IDE and C++. The ESP-32-CAM was used to take images of the water level at regular intervals, which were then passed through an image processing software that I developed using Python. This software could detect the depth of the water from the image, using a reference distance and edge-detecting algorithms. The ultrasonic sensor was used with an Arduino Nano to take regular distance readings. This data was used to measure the relative change in water depth. Both gauges worked off-grid using batteries and saved the relevant data to micro-SD cards. The study concluded that both gauges would be suitable alternatives for existing water level gauges.

Interests

I have played rugby since primary school and continue to do so whilst at university. Some of my highlights include being in the First XV at High School, being selected for Edinburgh U19's and U20's, playing for the University of Bath's first team in BUCS Super Rugby and playing for Scotland at the Junior Touch World Championship. Playing rugby has improved my teamwork skills, commitment and determination.