Adam J. **Biggs**

COMPUTER SCIENTIST · ARTIST

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Introduction

I am currently a PhD computer scientist studying robotics at the University of Nottingham. I am finding it increasingly difficult to stay focused and I would like to pursue the world of work instead. I am an avid Dungeons & Dragons player and game master who has been running games for 7 years and I am now seeking to pursue my true passion of planning, designing and creating battlemaps for Role-Playing Games.

Education

PhD Computer Science AI DTC — **The University of Nottingham**

2023 – Present

- Modelling Human-Robot Interaction in Social Spaces
- Can quadruped robot guides increase the safety and independence of people with vision-impairments in outdoor museum spaces?

MSc in Computing Science (Artificial Intelligence) — **The University of Nottingham**

2022 – 2023

- **Merit**.
- Dissertation (74%), **Games**, **Mixed Reality**, **Human-AI Interaction**, Advanced Algorithms & Data Structures, Linear & Discrete Optimization.

BSc (Hons) in Computing Science with a Year in Industry — **The University of East Anglia**

2017 – 2022

- **First Class Honours**.
- Final Year Project (75%), **Graphics 1 & 2**, **Computer Vision**, **Web-Based Programming**, , Data Structures & Algorithms, Software Engineering, Information Retrieval, Database Systems, Machine Learning.

A Level and GCSE — **The Bishop's Stortford High School**

2009 - 2017

- **A Levels**: Art, Computing incl. Project **(94%)**, Maths, Physics.
- **GCSE**: 3A*'s 3A's 6B's — including Art (A*).
- My artwork was included in a public exhibit in Bishop's Stortford.

Research Projects

OSMAI: A Generative OpenStreetMap Artificial Intelligence — **The University of Nottingham**

MSc Dissertation (74%)

- Typically, digital map creation relies on a manual design process which is time-consuming even for expert users. Recently, there has been a growing usage of generative image models to create map images. However, these techniques severely limit the possible applications those maps could then be used in. OSMAI is an AI natural language prompted system for generating map schemas using OpenStreetMap data.
- The dissertation was written in Python 3.8. and made use of the GPT-Neo model, specifically using the 125 Million parameter version, and interfaced using the Happy Transformers Python Library. The OpenStreetMap data set was processed into 25,000 worldwide settlement locations of 100 meters squared areas centred on target GPS coordinates which featured at least one building.
- The project successfully enabled a user to generate web mapping tool-compliant files through an intermediary schema. It could accept a range of input prompts and relied on worldwide data which lowered geographic bias in generated responses.
- Provided a test bed for understanding the operation and application of a GPT model and how it interacts with mathematical coordinate data.

Dungeonify: Generating Dungeons & Dragons Battle Maps from OpenStreetMap — **The University of East Anglia**

BSc Final Year Project (75%)

- The generation of battle maps for role-playing games is time consuming and difficult. Dungeonify aimed to solve this problem by using real-world map data to generate fully textured battle maps for the *Dungeons & Dragons* system.
- The project was built in Python 3, using the Pycairo graphics library and the OpenStreetMap (OSM) API and library.
- The solution enabled a user to select a number of real-world structures from the OSM and generate a correctly positioned battle map using changeable artists' textures and automatically generate a Virtual Table Top compatible file to enable its fast import into an online game.
- The greatest difficulty was correctly orientating each structure such that all walls followed the strict 90 degree lines of the inch square grid.

Mazer: Evaluating Algorithms for Generating & Solving Mazes in Real-Time — **The Bishop's Stortford High School**

The Computer Science Project (95%)

- Project compared various algorithms for generating and solving mazes visually. .NET Framework C# Project utilised Windows Presentation Foundation (WPF) controls, showing the steps in real-time and the instant update of visual settings while the generator or solver is running.
- Algorithms were compared for running time and maze complexity. The results were automatically displayed as a table and histogram.
- A total of twelve generating and solving algorithms were implemented for comparison, from the simple 'Drunkard's Walk' to the much more complex 'A*'. To ensure the solution met the requirements, it's core functionality was unit-tested.

Industrial Experience

School of Computing Sciences

Software Engineer (Paid Intern)

NORWICH *Jun. 2022 - Jul. 2022*

- A system for automated module feedback for all faculties at The University of East Anglia. Used Power Automate to generate template-based forms and create reports of feedback data. Project presented to the Associate Dean of Science at UEA (Simon Lancaster).

ProspectSoft Ltd.

Assistant Developer (Paid Year in Industry)

OXFORD *Nov. 2020 - Aug. 2021*

- Placement as an Assistant Software Developer at ProspectSoft; a business creating Customer Relationship Management (CRM) Software. Worked in the DevOps team fulfilling tickets as part of the tri-weekly Agile Scrum sprints and experienced full-stack development.
- Created and tested code written in typescript, SQL and C# (.NET framework) using Visual Studio Code, Sybase Central and Visual Studio. Jira Software for sprint planning, also Microsoft Azure Pipelines and Azure DevOps for Git Source Control.
- Implemented a main dashboard window, using front-end Typescript and HTML. Reports were displayed through back-end SQL. The daily stand-up meetings aided development throughout the task. Clear recorded evidence was required for each code modification.
- Created a Report Builder page which presented all of the reports in a more readable and accessible manner, which allowed them to be 'favour-ited' by the user. UI elements were coded to respond to the user's mouse movements. This front-end task was tested for use on mobile devices.

Faculty of Environmental Sciences

Software Engineer (Paid Intern)

NORWICH *Jun. 2019 - Sept. 2019*

- Relational Database and Interactive Website Designer in a NEXUSS Research Experience Placement at the University of East Anglia. Worked with Prof. A. Manning on the Atmospheric Greenhouse Gas Measurement Project. Gained experience of using Agile development techniques (series of 2-week sprints).
- Designed and created a MySQL database, migrating the existing Excel data. Implemented an Apache Server hosted web site using PHP7, HTML5/CSS and JavaScript.
- Created a .NET Framework C# utility to ensure data consistency and enable the automatic generation of the SQL, DDL and DML database scripts.
- Implemented a library of reusable PHP7 functions for consistent generation of repeating HTML5 blocks.
- Secured the solution against SQL Injection attacks.
- Source Code Management using GitHub having initially been handled using Dropbox.

Technical Skills

Software Development

- Experience using and developing code for Boston Dynamic's Spot and Unitree's Go2 robots using ROS2.
- Desktop GUI Object-Orientated design using **C#**, **C++**, C, Visual Basic, **Python**, Java and TypeScript. (incl. WPF, Infragistics and Office Add-Ins).
- Knowledge of generics, interfaces, data structures, bitwise logic operations and unit testing.
- Experience developing AI Chat Bot systems and machine learning techniques (incl. NLTK, scikit-learn and Weka) and using MATLAB.
- Web development in Python using Flask, psycopg2, Django, PHP & HTML5, TypeScript, JavaScript, CSS.
- Relational database design: PGAdmin3 using PostgreSQL, Apache web server, HTML5, PHP7 and MySQL.
- Experience with RESTful APIs.
- Proactively explored Robotic Process Automation (RPA).

IDE's & Frameworks

- Microsoft Visual Studio Code & Visual Studio Enterprise Edition. Microsoft .NET Framework (WPF including XAML & WinForms).
- NetBeans IDE (Java), Spyder (Python), CLion (C).
- Unity for 2D and 3D Packages, Blender and C++ OpenGL for 2D and 3D applications.
- Insomnia & Postman for APIs.
- Sybase Central, MySQL Workbench, Microsoft Azure and Power Automate.
- OpenSim, UseBOW.

Professional Skills

- 7 years of experience creating battle maps for Dungeons & Dragons games.
- Experience designing and creating hand-drawn battle maps and character artworks using Clip Studio Paint.
- Experience with **Git** based version control systems (incl. GitHub, GitLab & Azure DevOps)
- Experience using **Agile methodologies** (incl. test driven development) in teams ranging from 1 to 15 people.
- Microsoft Office suite and the LaTeX markup language.
- Completed TheConstruct Ros2 Training Course.
- Full UK Driving Licence Holder.

Extracurricular Activities

I am an active member of the Board Games and *Dungeons & Dragons* societies; often organising sessions. Acting as a Dungeon Master has allowed me to develop my time management, public speaking and team interaction skills. I am a talented artist and a keen reader of fantasy novels. I am also a member of the Badminton Club and enjoy jogging to keep fit.

References

References are available on request.