DAVID WILLIAMS

London, United Kingdom

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STATEMENT

I am a highly motivated first-year Software Engineering PhD Student studying Automated Program Repair (APR) using Large Language Models (LLMs) at University College London.

EDUCATION

University College London (UCL)   **Mar. 2024 – Present**
PhD Computer Science, Topic: Automated Program Repair (APR) using Large Language Models (LLMs)   *London, UK*
Supervised by: Dr Sergey Mechtaev (Primary), Prof. Federica Sarro (Secondary)

University College London (UCL)   **Sep. 2022 – Sep. 2023**
MSc Software Systems Engineering, Final Grade: **Distinction (76%)**   *London, UK*
Key Modules: Research Methods in Software Engineering (78%), Software Development Practice (79%), Practical Program Analysis (85%), Software Systems Integration (70%), Validation & Verification (82%), Complex Networks and Web (77.4%)

University of Surrey   **Sep. 2018 – Jun. 2021**
BSc Computer Science, Final Grade: **First-Class Honours (85%)**   *Guildford, UK*
Key Modules: Software Engineering (96%), Software Engineering Project (90%), Web Applications Development (89%), Programming Fundamentals (94%), Advanced Challenges in Web Technologies (74%), Computer Security (94%)

SKILLS

Programming Languages: I am proficient in Python and Java. I have experience with Ruby, JavaScript(/TS), C and C++.
Development Practices: Agile Methodologies, OOP, Requirements Engineering, Test-Driven Development
Technologies/Frameworks: GitHub, Docker, Kubernetes, SQL/NoSQL Databases, Web Dev (React, Express, Node, etc.)
General: Leadership, Academic Research/Writing, Critical Thinking, Excellent Written and Verbal Communication
Languages: English (Native), French (Native), Dutch (Fluent)

PROJECTS & EXPERIENCE

UCL   **Oct. 2023 – Mar. 2024**
Research Assistant   *London, UK*
- Conducting research in the fields of Automated Program Repair, Genetic Improvement, and Large Language Models.
- Wrote material for publication in internationally renowned software engineering conferences and journals.
- Co-authored a research paper in collaboration with several UCL professors and Bloomberg employees based on the code review tool developed in my prior work with Bloomberg (see below).
- **Publication:** "User-Centric Deployment of Automated Program Repair at Bloomberg" – `https://arxiv.org/abs/2311.10516`
  Awarded the ACM SIGSOFT Distinguished Paper Award @ International Conference on Software Engineering (ICSE) SEIP 2024

UCL/Bloomberg   **May 2023 – Sep. 2023**
Team Lead – MSc Dissertation Group Project   *London, UK*
- Led a team of students through the research and full development lifecycle of a novel code review tool "B-Assist" for Bloomberg.
- Upheld clear communication with clients and stakeholders throughout, ensuring our work was punctual and closely aligned with their expectations, ultimately leading to our primary deliverables being completed a week prior to our deadlines.
- Conducted research in the fields of code reviews, GitHub Suggested Changes and Automated Program Repair (APR).
- Implemented B-Assist in Python as a Flask GitHub App and hosted tool demonstration sessions to gauge engineer interest.
- **Following positive engineer reception, B-Assist was deployed and is now in use in over 1000 Bloomberg repositories.**

UCL/International Federation of Red Cross and Red Crescent Societies (IFRC)   **Nov. 2022 – May 2023**
Software Engineer – Student Project   *London, UK*
- Conducted requirements-gathering activities to identify our client's needs fully and designed a microservice architecture solution.
- Developed a full-stack mobile platform in Flutter/Firebase allowing the IFRC to host focus group discussions (FGDs) asynchronously and remotely through a short video format.
- **Our tool successfully showcased a new format for FGDs and is being explored for future implementation by the IFRC.**

University of Surrey   **Oct. 2020 – Jun. 2021**
BSc Dissertation - "Trustworthy Communication Platform using Blockchain"   *Guildford, UK*

- Conducted research in the fields of Software Development, EC Cryptography, and Blockchain.
- Designed, implemented, and documented a semi-decentralised JavaScript web application developed using MERN stack and integrated Ethereum via Solidity smart contracts.

PUBLICATIONS

Speeding Up Genetic Improvement via Regression Test Selection   **Jul. 2024**
*Giovani Guizzo, **David Williams**, Mark Harman, Justyna Petke, Federica Sarro*
ACM Transactions on Software Engineering and Methodologies (TOSEM)

User-Centric Deployment of Automated Program Repair at Bloomberg   **Apr. 2024**
***David Williams**, James Callan, Serkan Kirbas, Sergey Mechtaev, Justyna Petke, Thomas Prideaux-Ghee, Federica Sarro*   *Lisbon, PT*
International Conference on Software Engineering (ICSE) 2024 - Software Engineering in Practice (SEIP) Track

AWARDS

ACM SIGSOFT Distinguished Paper Award   **Apr. 2024**
Awarded for "User-Centric Deployment of Automated Program Repair at Bloomberg"   *Lisbon, PT*

Fivium Prize   **Jun. 2021**
"Best performance by a final year Computing student on the level 6 module, Advanced Challenges in Web Technologies"   *Guildford, UK*

Gold-i Prize   **Sep. 2020**
"Best performance on the Level 5 module, Advanced Object-oriented Programming using C++"   *Guildford, UK*