The Impact of Generative AI on teaching Team Projects in Computer Science

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Research project
The growing use and development of Generative AI tools to aid software developers may have a profound impact on how software products are designed, built and tested in the future. It is as yet unknown if the increased productivity promised by these tools will lead to fewer software products being developed using team-based methodologies, tools and practices previously established over many years, nor what impact these changes may have on the quality and safety of the software that is produced with their assistance. This project will explore the potential impact of using Generative AI to assist software development in teams using university student team projects as an initial case study, with further exploration using industry teams at a later stage. The initial case study will involve interviewing industry experts, students who work on these projects and the academics who teach team projects in Higher Education Computer Science. It will also involve experiments using Generative AI tools for specific (unassessed) tasks and evaluating the impact of these tools on the quality of the code solutions produced by the student teams and on the methods and techniques they use to create their solutions.

Possible research questions include:

- How do we need to adapt our teaching approaches in team projects to account for the use of Generative AI tools to design, build and test systems?
- Does using Generative AI mean we need to change our software development methodologies, the way we plan projects, the way teams work together?
- Does Generative AI increase the productivity of software development teams? Can Generative AI do all the work for the team? What are the limitations?
- Do we need to develop new practices and methodologies to take advantage of Generative AI?
- Do we need new software standards for code produced with the assistance of Generative AI?

Applicant skills/background
This project requires knowledge/exploration of software development methodologies and tools currently used in industry and in teaching Higher Education Computer Science. The applicant should be able to program in Python using frameworks such as Flask, conduct analysis and evaluation of code and documentation artefacts including

those generated by AI tools such as Gemini AI, Chat GPT, LLaMA etc. Ideally they should also have some numerical data analysis experience.

References

https://brainhub.eu/library/software-developer-age-of-ai - [Online] - Accessed 21/05/2024

Denny et Al, "Computing Education in the Era of Generative AI" by Denny et al., Communications of the ACM, Volume 67, Issue 2 (CACM 67:2).

MacNeil et Al, Discussing the Changing Landscape of Generative AI in Computing Education, SIGCSE 2024: Proceedings of the 55th ACM Technical Symposium on Computer Science Education, Volume 2, March 2024, pp1916