Mark Wlodawski

ENC3241 Proposal Draft

Proposal topic: Effects of Artificial Intelligence on web and mobile development

Proposal scope: Skill level and performance differences between human and AI developers, changes in career demand and requirements, outlook of advancement in field.

Prospective faculty mentor: Professor John Aedo

Project Title: AI Ruling the Internet: Effects of AI on Web and Mobile Development:

Project Objective or Aim: Will there be a future for developers of web and mobile applications? Will companies forego human employees in exchange for artificial ones? I aim to research the benefits of both human web developers and artificial intelligence software meant to perform many of the tasks that humans are currently paid to do, as well as examine the possible benefits of AI to developers, in the case that they are not replaced, but enhanced. The case has been made that web, mobile, and software developers will not all be replaced, but instead their productivity will increase.

Project Background and Significance: I have several years of experience as a web and mobile application developer as well as an interest in artificial intelligence and machine learning. In addition, I have several certifications in both, and I am currently enrolled at the University of Central Florida as a Computer Science student. All of this means that the future of the fields of web, mobile, and software development, as well as artificial intelligence, are extremely important to me. My fate, as well as those of many students and professionals I know, will be affected by these developments. In order to complete this study, I will have to first examine the history of artificial intelligence in software development and its effect on employment. Next, I will study the current state of artificial intelligence and conduct surveys of developers to examine at what level it is used. I will supplement this with figures estimating the expenditures of companies on AI and compare it to rates paid to developers. Finally, I will forecast the change in employment and demand for services provided by humans versus those that can be easily outsourced to development services provided by AI.

The results of this study will potentially impact the software development, education, and corporate world in several different ways. If I find that the majority of developers can be replaced by AI code-generating software, there will be fewer job openings for them. This will result in lower demand for bootcamps, training classes to prepare inexperienced web developers for these jobs, and online content creators who also depend on this income. Furthermore, the quality of code written will be up to the quality of the AI, and varying levels of it will still need to be modified and maintained by humans who notice issues. Finally, companies like Microsoft and Google have been spending billions of dollars on its development, yet they and smaller companies have yet to show a profit, so they must be cutting spending elsewhere.

On the other hand, if I find that software and web developers, as well as the companies they work for, benefit from AI software supplementing their work, I will need time to estimate and document this. The outcome of the surveys and internal corporate reports may show that jobs are also being created and profits can be achieved, which will result in different external benefits.

Research Methods: I will require several different methods in order to conduct my research concerning the growth of artificial intelligence and its effects on web, software, and application development, as well as forecasting the change in the various industries. First, as part of researching its past influence on software and web development, I will need to find sources of the information and then document the history of the development of artificial intelligence. This will include noting the professions of the initial developers and the growth of the numbers as time progressed. I would also need to chart the increase in supplementary positions, influence on other industries, demand for change in hardware, and the change in software and web development that resulted. Second, in order to report on its recent and current impacts, I will need to look for sources that report on its effects on software and web development, including the decrease in demand for entry-level web and software developers. In addition, the economic and environmental impacts must be reported, which can be found in many areas of the news and places online. Furthermore, I will need to conduct surveys of developers and find documentation of their personal opinions online, which will show how much they currently rely on AI to complete their work. These AI coding programs range from code completion in VS code all the way to Vibe Coding, in which artificial intelligence is told details of an application and most, if not all, of the work is done for developers. Finally, I will forecast and research changes on the industries listed here, changes in software and web quality and employment, education, economic, and environmental impacts. This will require drawing together the results of the previous research, recent economic impacts and investments, and documentation of professional developers concerning the quality of current software.

Expected Outcome: I will produce a white paper with charts, diagrams, and tables, preparing a possible speaker to make a presentation. I expect that the outcome of my research will be important for representatives of many different industries to hear, so it will be beneficial to share the results publicly. It is possible that I will find that advancement in AI has been beneficial and will continue to generate more jobs, growth in industry, and demand for higher education; on the other hand, I may find that corporate investments are geared towards replacing junior and mid-level jobs, just as they have been replacing factory jobs with robots, and code-development software will be sufficient. Another possibility is that there will be a midground in which jobs will be generated and software produced will improve. The results will be interesting and influential for those students choosing educational paths, companies deciding whether to invest in AI development, and professional developers deciding whether to prepare for a different career. Online content, such as blog posts and videos, will make it easier to reach all students, including the remote students who would not be able to attend in person, and those working at the time a speech would be given. In addition to the web content, posters, handouts, and conferences specifically geared towards technical degrees like computer science. This will have several benefits for students, teachers, and university decisions for which classes to promote; however, if I find that AI will result in increased demand for workers and education in other fields, both students and professionals will be interested to know. I will personally benefit because, as a computer science major, I need to choose a series of electives that will be geared towards cybersecurity, artificial intelligence, robotics, or an assortment of each. The electives I choose will most likely have an impact both on my appeal upon graduation and interest in which field to focus on.

Literature Review:

1. **Title:**[**The impact of AI on employment: a historical account of its evolution**](https://www.econstor.eu/bitstream/10419/205178/1/Garcia-Murillo-MacInnes.pdf)
   1. **Authors:**[Garcia-Murillo, Martha](https://www.econstor.eu/browse?type=author&value=Garcia-Murillo%2C+Martha)  
      [MacInnes, Ian](https://www.econstor.eu/browse?type=author&value=MacInnes%2C+Ian)
   2. Link: <https://hdl.handle.net/10419/205178>
2. Title: Help Helps, but only so Much: Research on Help Seeking with Intelligent Tutoring Systems.
   1. Authors: Aleven, V., Roll, I., McLaren, B. M., &amp; Koedinger, K. R
   2. Link: https://www.telegraph.co.uk/technology/news/10129285/Chinesesupercomputer -is-worlds-fastest-at-33860-trillion-calculations-per-second.html
3. Title: Employment by major industry sector.
   1. Authors: Boyle, K.
   2. Link: <https://www.bls.gov/emp/tables/employment-by-major-industry-sector.htm>
4. Title: Does Automation Raise Skill Requirement?
   1. Author: Bright, J. R.
   2. Source: Harvard Business Review, 36, 84-98.
5. Title: An intelligent mobile-enabled expert system for tuberculosis disease diagnosis in real time.
   1. Authors: J., &amp; Hossain, M. A.
   2. Source: doi:https://doi.org/10.1016/j.eswa.2018.07.014
6. Title: The Future of Software Engineering by 2050s: Will AI Replace Software Engineers?
   1. Author: Lubna Mahmoud Abu Zohair
   2. Source: https://www.researchgate.net/profile/Lubna-Mahmoud-Abu-Zohair/publication/330185339\_The\_Future\_of\_Software\_Engineering\_by\_2050s\_Will\_AI\_Replace\_Software\_Engineers/links/650d3c4b82f01628f03a7123/The-Future-of-Software-Engineering-by-2050s-Will-AI-Replace-Software-Engineers.pdf

Preliminary Work and Experience: I have been following the advancement of AI and its impact on software and web development for several years, and have been interested to see the changes in web development programs. I have also experienced the change in amount of work needed for applications, decrease in number of available jobs, and increase in recruiters asking for AI experience. I have earned a certification from the USAII(US AI Institute) as a Certified AI Engineer, and have had to increase my own skill level in several other fields. In addition, I have spent countless hours monitoring growth in the field, advancements in various programs, economic changes, and large number of startups based on AI and machine learning technology. All of this experience will give me a boost in the work and help me know where to look, in addition to making contacts in several companies willing to answer surveys. My personal and professional experience in the relevant fields will speed up the process.

IRB/IACUC statement: Given that the surveys will only be asking developers their opinions and experience benefiting or not from the use of AI, IRB and IACUC approval would not be required.

Budget: The required budget for this study would not exceed $500-$1,000, assuming it would take advantage of free knowledge and videos and require email, survey, and result-recording services and few workers.

Figures and Tables: 

