



Default Question Block

Using code-generating AI tools at work – Developers' perception

Project funded by ARC Australian Laureate Fellowship FL190100035

Please read this description in full before deciding whether or not to participate in this research. If you would like further information regarding any aspect of this project, you are encouraged to contact the researchers via the email address listed below.

What does the research involve?

Background: Currently, many code-generating AI tools exist for developers to use. The understanding of the usage of such tools in professional environments and their role in generating code meeting human value requirements, especially user data protection requirements, is little to none.

Objective: The objective of this study is to gain an understanding of developers' perception of using code-generating AI tools in developing software, especially with respect to ensuring user data protection requirements are met.

Procedure: This project follows the below step-by-step process.

Data collection: If you are willing to participate in this study, you may fill in this questionnaire (around 15–20 minutes to fill) consisting of the consent to participate, questions on demographics, your opinion and experience (if any) with code-generating AI tools.

Data analysis: The researchers will analyse the collected data quantitatively and qualitatively. Analysis of the data will involve comparing data from one survey response to another in order to identify patterns of common concepts. Further abstraction of data at different levels will lead to new knowledge and insights about developer perception of using code-generating AI tools and their role in generating code to meet user data protection-related software requirements.

Invitation

As a professional software developer, we invite you to participate in this study, and your participation is voluntary.

Consenting to participate in the project and withdrawing from the research

Consenting: As a general practice, you are required to give your consent to participate by ticking the boxes given in the latter part of this page.

Withdrawing: You can exit without completing this questionnaire without giving a reason. All data will be deleted once you exit without completing all the questions. There are no consequences to withdrawal.

Possible benefits

Knowledge and insights about the use of code-generating AI tools and their role in generating code to meet user data protection-related requirements, and recommendations for improving such tools.

Confidentiality

This survey is anonymous. Any research publication published as a result of the study will not identify you, your company or any non-participant in your company. **At the end of the survey, you will be asked if you are interested in participating in a future study. In this case, you will be diverted to a different form to share your contact details.**

Storage of data

Data in a Google Drive with restricted access (only investigators have access) for a period of 5 years and destroyed thereafter.

Use of data for other purposes

In accordance with data-sharing guidelines, data may be made available for use by other researchers. This data will be held in Principal Investigator's GitHub and may be a requirement of some journals prior to publication. Any shared data will not include your identity details.

Results

The findings of this study will be published in academic and practitioner-based journals, conferences, and magazines. Further, free access to the publications in the form of preprints will be available on arXiv (<https://arxiv.org/>).

Complaints

Should you have any concerns or complaints about the conduct of the project, you are welcome to contact the Executive Officer, Monash University Human Research Ethics Committee (MUHREC):

Executive Officer

Monash University Human Research Ethics Committee (MUHREC)

Room 111, Chancellery Building D,

26 Sports Walk, Clayton Campus Research Office

Monash University VIC 3800

Tel: +61 3 9905 2052

Email: muhrec@monash.edu

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Investigators

Dr Kashumi Madampe (Chief Investigator), Prof John Grundy, and Dr Nalin Arachchilage.

Contact Information

If you have any questions regarding this survey and the project, feel free to contact Dr Kashumi Madampe at kashumi.madampe@monash.edu.

Consent

- ☐ I confirm that I have understood the nature of the research, and I have had the opportunity to ask questions and have had them answered to my satisfaction.
- ☐ I confirm that I am a professional software developer
- ☐ I agree to take part in this study
- ☐ I understand that I am free to withdraw my participation before the survey has been completed without giving a reason
- ☐ I agree to fill in this questionnaire
- ☐ I understand my personal information maybe collected in the next section of this questionnaire

Prolific ID

What is your Prolific ID?

Please note that this response should auto-fill with the correct ID.

$\$ \{e://Field/PROLIFIC_PID\}$

Demographics

This section is intended to gather basic information of the participant.

NOTE

We assure details of the participants, and all other confidential information shared will be kept confidential. The details of the participants will not be specified in any of the publications or report.

How old are you?

20 - 25

To which gender identify do you most identify?

- ☐ Man
- ☐ Woman
- ☐ Non-binary / gender diverse
- ☐ My gender identity isn't listed. I identify as:
- ☐ Prefer not to say

In which country do you currently reside?

Afghanistan

Which of the following describes you, if any?

- ☐ I have a concentration and/or memory disorder (e.g., ADHD, etc.)
- ☐ I have an anxiety disorder
- ☐ I have a mood or emotional disorder (e.g., depression, bipolar disorder, etc.)
- ☐ I have autism/an autism spectrum disorder (e.g., Asperger's, etc.)

☐ I have learning differences (e.g., Dyslexic, Dyslexia, etc.)

☐ Other (Please specify)

Professional Experience

Professional experience

Total experience in software industry (years) eg: 2.5 years:

Total agile experience (years), if any

Coding Experience

Coding Experience

Years of coding

Including any education, how many years have you been coding in total?

NOT including education, how many years have coded professionally (as a part of your work)?

How did you learn to code? Select all that apply.

☐ School (i.e., University, College, etc)

☐ Books/Physical media

☐ On the job training

☐ Coding bootcamp

☐ Hackathons (virtual or in-person)

☐ Online courses or certification

☐ Other online resources (e.g., videos, blogs, forum)

☐ Colleague

☐ Friend or family member

☐

Other (Please specify)

Which programming, scripting, and markup languages have you done extensive work on in the past year, and which do you work now?

	Past year	Now
Python	<input type="checkbox"/>	<input type="checkbox"/>
R	<input type="checkbox"/>	<input type="checkbox"/>
Java	<input type="checkbox"/>	<input type="checkbox"/>
C	<input type="checkbox"/>	<input type="checkbox"/>
C#	<input type="checkbox"/>	<input type="checkbox"/>
C++	<input type="checkbox"/>	<input type="checkbox"/>
Objective-C	<input type="checkbox"/>	<input type="checkbox"/>
Ruby	<input type="checkbox"/>	<input type="checkbox"/>
Swift	<input type="checkbox"/>	<input type="checkbox"/>
TypeScript	<input type="checkbox"/>	<input type="checkbox"/>
SQL	<input type="checkbox"/>	<input type="checkbox"/>
PHP	<input type="checkbox"/>	<input type="checkbox"/>
JavaScript	<input type="checkbox"/>	<input type="checkbox"/>
HTML/CSS	<input type="checkbox"/>	<input type="checkbox"/>
Other (Please specify)	<input type="checkbox"/>	<input type="checkbox"/>

Which database environments have you done extensive work on in the past year, and which do you want to work now?

	Past year	Now
MySQL	<input type="checkbox"/>	<input type="checkbox"/>
PostgreSQL	<input type="checkbox"/>	<input type="checkbox"/>
SQLite	<input type="checkbox"/>	<input type="checkbox"/>
MongoDB	<input type="checkbox"/>	<input type="checkbox"/>
Microsoft SQL Server	<input type="checkbox"/>	<input type="checkbox"/>
Redis	<input type="checkbox"/>	<input type="checkbox"/>
MariaDB	<input type="checkbox"/>	<input type="checkbox"/>
Elasticsearch	<input type="checkbox"/>	<input type="checkbox"/>
Oracle	<input type="checkbox"/>	<input type="checkbox"/>
Firebase Realtime Database	<input type="checkbox"/>	<input type="checkbox"/>
Other (Please specify)	<input type="checkbox"/>	<input type="checkbox"/>
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Which web frameworks and web technologies have you done extensive work on in the past year, and which do you want to work now?

	Past year	Now
Node.js	<input type="checkbox"/>	<input type="checkbox"/>
React.js	<input type="checkbox"/>	<input type="checkbox"/>
jQuery	<input type="checkbox"/>	<input type="checkbox"/>
Express	<input type="checkbox"/>	<input type="checkbox"/>
Angular	<input type="checkbox"/>	<input type="checkbox"/>
Vue.js	<input type="checkbox"/>	<input type="checkbox"/>
ASP.NET Core	<input type="checkbox"/>	<input type="checkbox"/>
ASP.NET	<input type="checkbox"/>	<input type="checkbox"/>
Django	<input type="checkbox"/>	<input type="checkbox"/>
Flask	<input type="checkbox"/>	<input type="checkbox"/>

Past year

Now

Laravel

☐☐

Ruby on Rails

☐☐

Other (Please specify)

☐☐

Which other frameworks and libraries have you done extensive work on in the past year, and which do you want to work now?

Past year

Now

.NET

☐☐

NumPy

☐☐

Pandas

☐☐

Spring

☐☐

TensorFlow

☐☐

Flutter

☐☐

Scikit-learn

☐☐

React Native

☐☐

PyTorch

☐☐

Keras

☐☐

Xamarin

☐☐

Hadoop

☐☐

Apache Shark

☐☐

Hugging Face Transformers

☐☐

Tidymverse

☐☐

Other (Please specify)

☐☐

Which development environments did you regularly use over the past year, and which do you want to work with over the next year?

	Past year	Now
Visual Studio Code	<input type="checkbox"/>	<input type="checkbox"/>
Visual Studio	<input type="checkbox"/>	<input type="checkbox"/>
IntelliJ	<input type="checkbox"/>	<input type="checkbox"/>
Notepad++	<input type="checkbox"/>	<input type="checkbox"/>
Vim	<input type="checkbox"/>	<input type="checkbox"/>
Android Studio	<input type="checkbox"/>	<input type="checkbox"/>
PyCharm	<input type="checkbox"/>	<input type="checkbox"/>
Eclipse	<input type="checkbox"/>	<input type="checkbox"/>
XCode	<input type="checkbox"/>	<input type="checkbox"/>
NetBeans	<input type="checkbox"/>	<input type="checkbox"/>
RStudio	<input type="checkbox"/>	<input type="checkbox"/>
Spyder	<input type="checkbox"/>	<input type="checkbox"/>
Other (Please specify)	<input type="checkbox"/>	<input type="checkbox"/>
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What is the primary operating system in which you work?

☐ Windows

☐ Linux-based

☐ macOS

☐

Other

How frequently do you experience each of the following?

	Never	1-2 times a week	3-5 times a week	6-10 times a week	10+ times a week
Encountering knowledge silos at work?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Never	1-2 times a week	3-5 times a week	6-10 times a week	10+ times a week
Needing help from people outside your immediate team?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Context

How many employees work in your organisation?

- ☐ Less than 10
- ☐ 11-50
- ☐ 51-100
- ☐ 101-500
- ☐ 501-1000
- ☐ 1001-5000
- ☐ 5001-10000
- ☐ More than 10000

In which industry are you employed?

- ☐ IT
- ☐ Finance & Banking
- ☐ Transport
- ☐ Medical
- ☐ Telecom
- ☐ Healthcare
- ☐ Manufacturing
- ☐

Other (Please specify)

Which best describes your current work situation?

- ☐ Full in-person
- ☐ Fully remote
- ☐ Hybrid (some remote, some in-person)

Which of the following best describes your current employment status?

- ☐ Employed, full-time
- ☐ Employed, part-time
- ☐ Independent contractor, freelancer, or self-employed
- ☐ Other (Please specify)

Which of the following describes your current job? Select all that apply.

- ☐ Developer, full-stack
- ☐ Developer, back-end
- ☐ Developer, front-end
- ☐ Developer, desktop or enterprise applications
- ☐ Developer, mobile
- ☐ DevOps specialist
- ☐ Data scientist
- ☐ Data analyst
- ☐ Other (Please specify)

Perception about code-generating AI tools

What is your opinion about using code-generating AI tools at work?

How frequently do you use code-generating AI tools at work?

Never

1-2 times a week

3-5 times a week

6-10 times a week

10+ times a week

☐

☐

☐

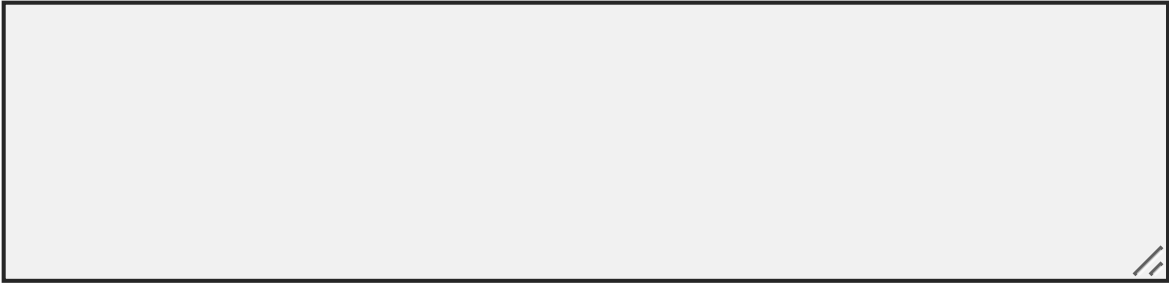
☐

☐

What are the code-generating AI tools you use at work?

Why do you use them?

Why don't you use them?



Please rate your level of agreement with the following statements:

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Code-generating AI tools help me improve my overall individual productivity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Code-generating AI tools help me get rid of knowledge silos I encounter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Support from the organisation

	Yes	No
My employer gives me time to learn new skills	<input type="radio"/>	<input type="radio"/>
My employer allows me to use code-generating AI tools	<input type="radio"/>	<input type="radio"/>

Meeting privacy requirements

The next set of questions are on ensuring privacy requirements in software development.
By “privacy” we mean the protection of “user data” collection, storing, and sharing the collected data.

Yes

No

At the first instance of using the code-generating AI tool, I expected it to ensure privacy requirements are met in the code it generated

☐☐

By “privacy” we mean the protection of “user data” collection, storing, and sharing the collected data.

Never Sometimes About half the time Most of the time Always

According to my experience, even without asking the code-generating AI tool, the code it generates ensures privacy requirements

☐☐☐☐☐

Respond with the choice next to “always” to this item

☐☐☐☐☐

I use code-generating AI tools specifically to generate code to meet the privacy requirements of the software I develop

☐☐☐☐☐

I put extra effort into double-checking the code generated by the AI tool to ensure the privacy requirements are met

☐☐☐☐☐

Select the second choice for this item

☐☐☐☐☐

Even though I use code-generating AI tools, I write code manually to ensure privacy requirements are met

☐☐☐☐☐

What challenges have you encountered when using code-generating AI tools to generate code to ensure privacy requirements are met in the software you developed, if any?

What is your perception of using code-generating AI tools to meet privacy requirements in the software you develop?

A large, empty rectangular text box with a thin black border, intended for the respondent's answer to the first question. A small double-slash icon is visible in the bottom right corner.

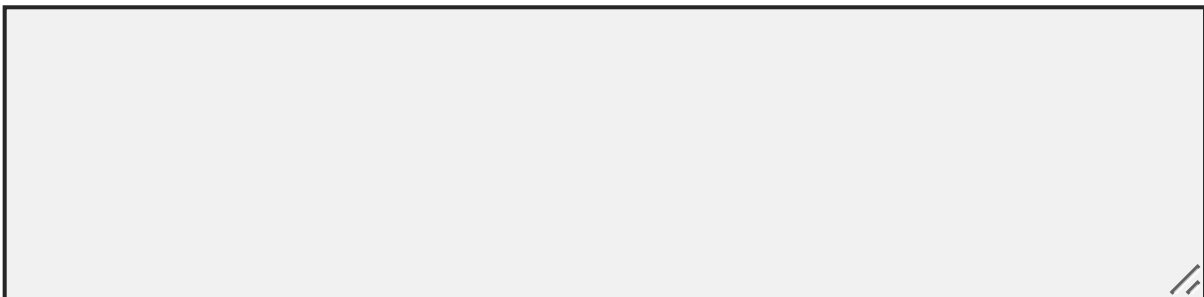
In your opinion, what improvements can be made to the code-generating AI tools to ensure privacy requirements are ensured in the code they generate?

A large, empty rectangular text box with a thin black border, intended for the respondent's answer to the second question. A small double-slash icon is visible in the bottom right corner.

Meeting other human values

Privacy (data protection) is one of the human values. What other human values do you include in the software you develop?

E.g., transparency, honesty, equality, freedom. For more human values refer to the Table on page 6 of this article: <https://arxiv.org/pdf/2012.10095.pdf>

A large, empty rectangular text box with a thin black border, intended for the respondent's answer to the third question. A small double-slash icon is visible in the bottom right corner.

Closure

If you have anything else to share, please feel free to share it below.



We will be conducting an experimental study with code-generating AI tools in which participants are expected to write code. If you are interested in participating in the study, please share your name and email address by clicking [here](#).

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