SLR Data Extraction Form

Large Language Model-based Tools and Novice Software Developers.

* In	dicates required question	
1.	Email *	
2.	Paper ID *	
3.	Paper Title *	
4.	Authors' Name *	
5.	First Author's Affiliation Country *	
6.	Published Year *	

7.	Published Venue *		
8.	Source Type *	•	Dropdown
	Mark only one oval.		
	ACM DL		
	IEEE Xplore		
	SpringerLink		
	Wiley		
	Scopus		
	ScienceDirect		
	Arxiv		
	Backward Snowballing		
	Forward Snowballing		
9.	Type of study *	\odot	Dropdown
	Mark only one oval.		
	Journal publication		
	Conference paper		
	Workshop paper		
	Magazine paper		
	Report		

10.	Domain *	
	Tick all that apply.	
	Human-Al interaction	
	Computing Education	
	Virtual Reality Development	
	Embedded Systems	
	Security	
	Game development	
	Code Quality	
	Learning Agent-based Modeling	
	Other:	
11.	Ranking of the Venue (<u>CORE</u> for Conference paper/ <u>Scimago</u> for * Dropdow	n
	Journal paper)	1
	Mark only one oval.	
	A*	
	A	
	В	
	Australasian B	
	С	
	Q1	
	Q2	
	Q3	
	Q4	
	NOT RANKED	
	NOT PUBLISHED (ArXiv)	
	National: Romania	
	◯ N/A	

RQ1: Motivations and Methodological Approaches

12.	Study Motivation (or N/A) *
13.	Study Aim / Goal (or N/A) *
14.	Research Questions (or N/A) *

15.	Research Method (Use Other to add other research methods). *	
	Tick all that apply.	
	Survey/Questionnaire	
	Controlled experiment	
	Case Study	
	Semi-structured Interview	
	Observation	
	Retrospective Interview study	
	Design Probe study	
	Within-subject comparative study	
	Action Research	
	Fieldwork	
	Task-based user study	
	Other:	
16.	Type of Research Method *	Dropdown
	Mark only one oval.	
	Qualitative	
	Quantitative	
	Mixed Methods	

17.

What Data Analysis Technique are used in the paper? Use Other to add other data analysis techniques. Tick all that apply. coding categorization open coding open-ended coding thematic analysis content analysis grounded theory socio-technical grounded theory conversation analysis descriptive anaylsis student t-test paired t-test multivariate regression analysis logistic regression analysis Mann Whitney U test Pearson correlation Spearman correlation Wilcoxon test Shapiro Wilk test Friedman test ANOVA test Chi-squared test Krippendorff's Partial Least Squares-Structural Equation Modeling Heterotrait-Monotrait ratio of correlations (HTMT) Cronbach's alpha average variance extracted (AVE) Collinearity Analysis N/A Other:

18.	Does the study has Ethics Approval? *	\odot	Dropdown
	Mark only one oval.		
	Yes		
	Not identified		
19.	What are the Participants' Profiles in the paper?		*
	We defined <u>Industry Junior software developers</u> as professionals we or equal to two years of industry experience	ith le :	ss than
	Tick all that apply.		
	Computer Science Students		
	Industry Junior Developers		
20.	(If applicable) Level of the Computer Science Students		
	Tick all that apply.		
	Undergraduate		
	Graduate		
	Unstated/Unclear		
21.	Do the authors make clear the definition applied for "junior softwa	re de	veloper"?
	Mark only one oval.		
	Yes		
	◯ No		

22.	If Yes, tell about how the study defines?
23.	Does the study come up with any framework/ model/ theory/ a set of guidelines as the final outcomes? (Explain about it)
24.	(If applicable) How do they evaluate their results/ framework/ model?
25.	Is the study based in Academia or Industry? * Mark only one oval.
	Academia Industry Mixed Unspecified

RQ2: Key Software Development Tasks

26. What key software development tasks are Junior Software Developers/CS Students using LLM-based tools for?

Tick all that apply.
to understand Computer Science-related concepts (conceptual understanding)
for brainstorm
to understand the problem (problem understanding)
to produce game content
to generate boilerplate code / starter code / repetitive code
to generate regular expression
to generate log messages
to correcting syntax
to improve code style
to improve code performance
to understand code
refactoring code (e.g., rewrite code with new conventions)
research / searching (e.g., replacing Google or Stack Overflow)
test case generation
to generate data for tests
unit test generation
debugging
rubber duck debugging
to generate documentation
to generate comments
code analysis (e.g., runtime analysis)
convert code from a language to another
□ N/A
Other:

27.	(If applicable) What key educational-related tasks are Computer Science students using LLM-based tools for?
	Tick all that apply.
	for programming assignments
	for Non-CS related assignments
	to study (e.g., study buddy)
	writing assistant
	assisting during project work
	Other:
28.	What are the LLM-based tools being used by the Software Developers/Teams? *
20.	What are the Lew based tools being asea by the software bevelopers, realing.
	Tick all that apply.
	ChatGPT
	Github Copilot
	Big Chat (Microsoft Copilot)
	Bard (Gemini)
	Tabnine
	Claude
	☐ Kite
	Codewhisperer
	Phind
	Perplexity
	Codex
	DeepCode
	Polycoder
	AiXcoder
	MidJourney
	Dall-E
	□ N/A
	Other:

RQ3: Perceptions about LLM4SE

Tick all that apply.	
usefulness	
trust	
engagement	
privacy	
security	
motivation	
improvements	
emotions (e.g., fear, frustration, surprise, hesitation, pessimism, satisfaction)	
job market	
evolution/progress stage	
collaboration	
easy to use	
education	
productivity	
impact on developers' skills	
culture	
fairness / bias	
ethical aspects (e.g., copyrights)	
output quality	
Other:	
What are the major benefits/ advantages reported of Junior Software Developers/CS Students adopting LLM-based tools?	
3	

What are major challenges reported from Junior Software Developers/CS Students adopting LLM-based tools?
What are the major recommendations/ best practices reported for Junior Software Developers/CS Students ?
What are the major recommendations/ best practices reported for Educators
What are the major gaps/limitations about Junior Software Developers/CS Students adopting LLM-based tools?

	impact?			
36.	What is the nature of the impact of LLMs for SE from study participants' perception?	*⊙	Dropdowr	
	Mark only one oval.			
	Positive			
	Negative			
	Undertermined			
	Mixed			
	○ N/A			
RC	(4: Limitations and Future Research Needs			
37.	Main Findings/Outcomes (or Not Identified) *			

38.	(For controlled experiments) does participant using LLM-based tools demonstrate significant difference to non-users?
	Mark only one oval.
	Yes
	No
	Mixed
	Unspecified
39.	Main Limitations (or Not Identified) *
40.	Future Research Needs (or Not Identified) *

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