

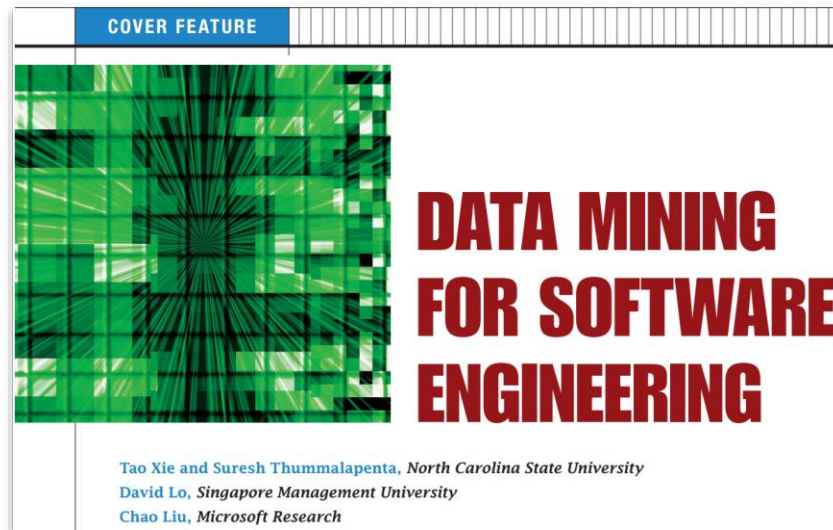


Trustworthy and Synergistic AI4SE: Vision and the Road Ahead

AI4SE and Its Rapid Growth



MSR 2004: International Workshop on Mining Software Repositories
2004.msrfconf.org



**IEEE
Computer
2009**

AI4SE and Its Rapid Growth

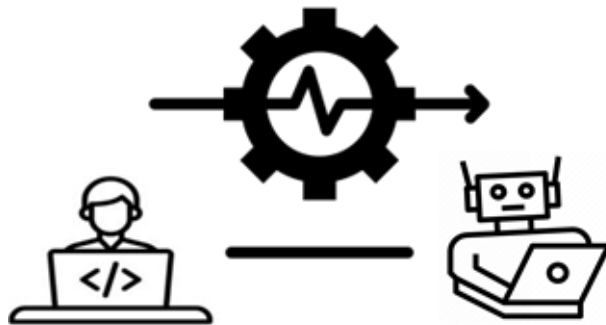
Top 10 Topics – Submitted

Topics	# Submitted Papers	# Accepted Papers	Acceptance Rate
Machine Learning with and for SE	237	74	31,22%
Software Testing	181	47	25,97%
Program Analysis	117	35	29,91%
Evolution and maintenance	105	31	29,52%
Mining Software Repositories	105	23	21,90%
Software Security	85	25	29,41%
Human Aspects of SE	68	20	29,41%
Validation and Verification	53	15	28,30%
Tools and Environments	49	12	24,49%
Reliability and Safety	46	15	32,61%

<https://twitter.com/AndreasZeller/status/1509477594416168964>



Trustworthy AI4SE



Synergistic AI4SE

Need for Trustworthiness

ESEC/FSE 2015

How Practitioners Perceive
the Relevance of Software Engineering Research

“I doubt any automated software can
explain the reason for things ...”

*“It seems that there could be
potentially **disastrous results** if the
automation does not [do things]
correctly..”*



NEWS

Friend or foe: Can computer coders trust ChatGPT?

31 March



The Register®




SOFTWARE

59 

ChatGPT creates mostly insecure code, but won't tell you unless you ask

Boffins warn of risks from chatbot model that,
Dunning–Kruger style, fails to catch its own bad
advice

 [Thomas Claburn](#)

Fri 21 Apr 2023 // 01:28 UTC

Need for Synergy

*“the interaction or **cooperation** of two or more ... agents to produce a **combined effect greater than the sum of their separate effects**” - Oxford*

Human & intelligent agent
may not work well together

1:1

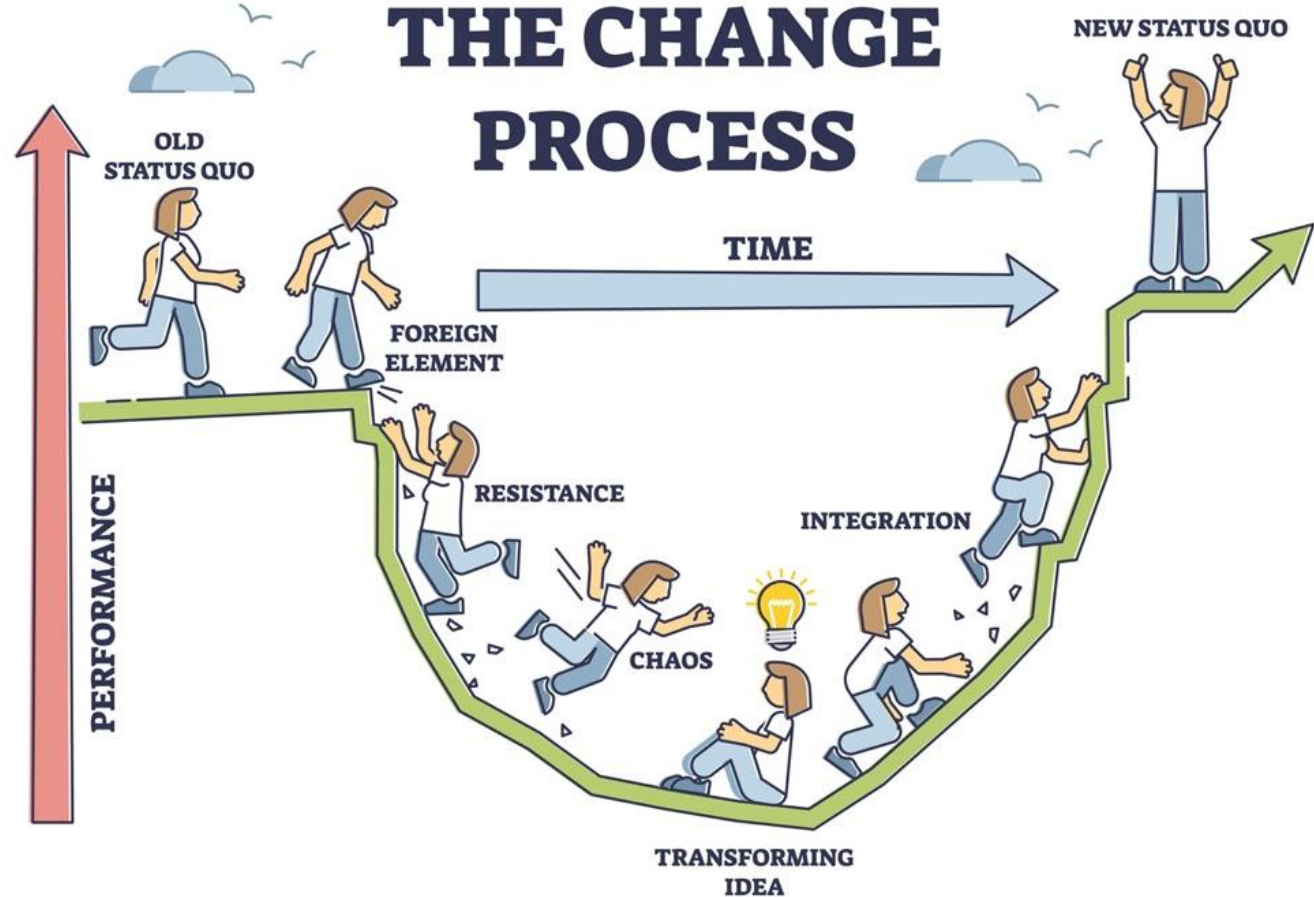


Boy who cried wolf

Need for Synergy

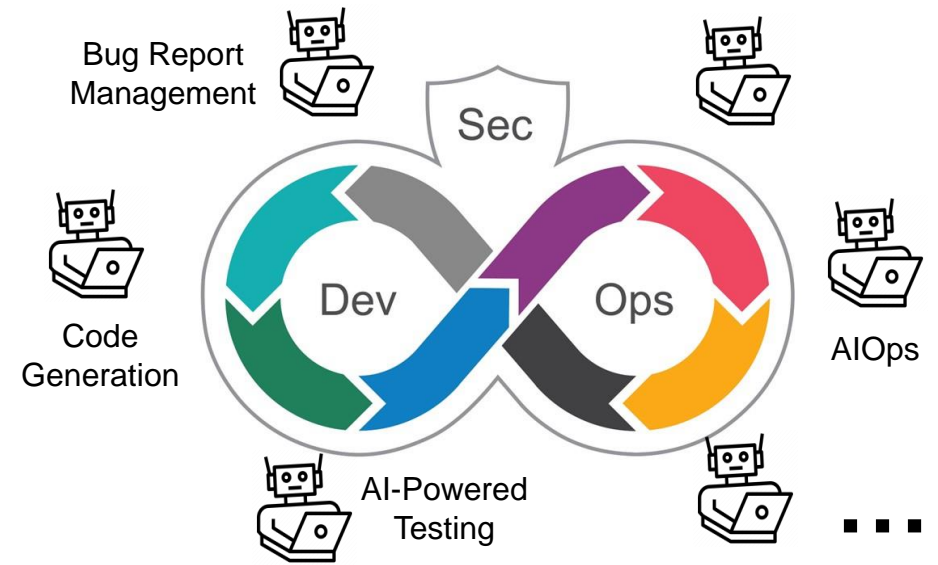
*How to measure?
How to speed up?
Any automated help?*

1:1



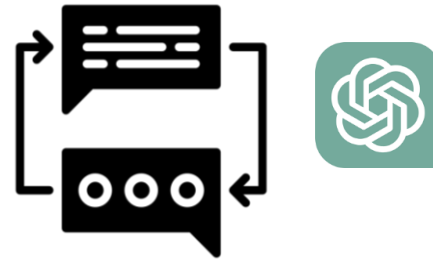
Need for Synergy

Lack of holistic workflow-aware solution



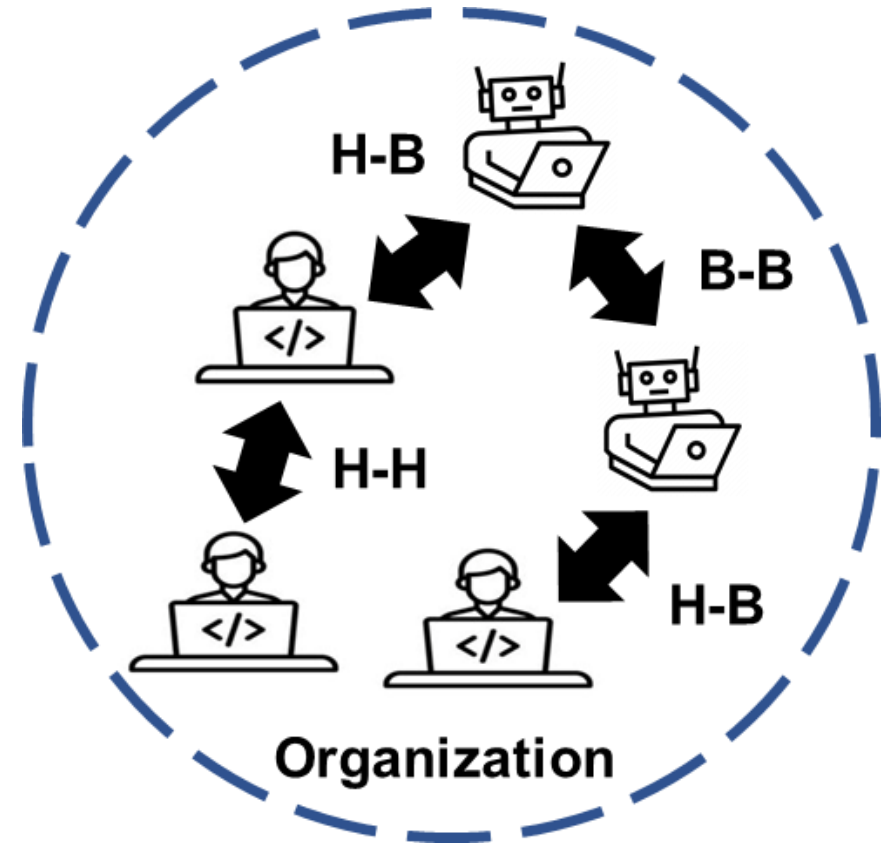
1:1

Limited interactivity



Need for Synergy

N:M??



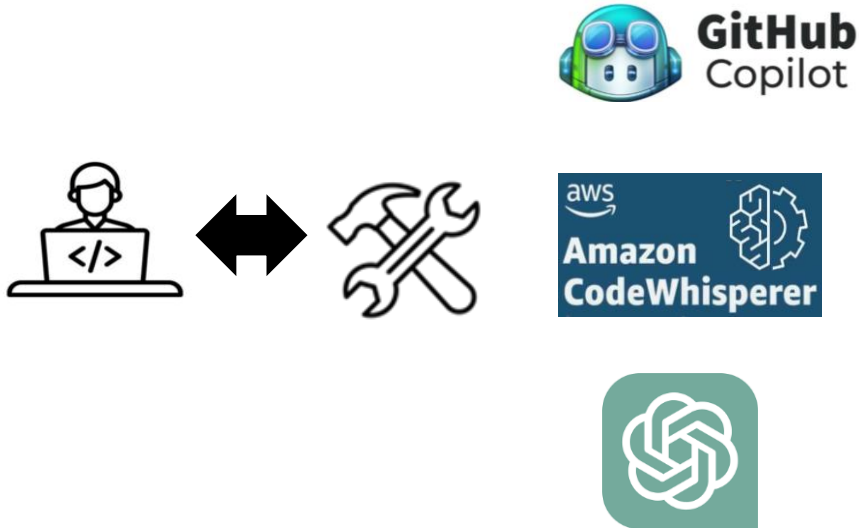
What can we realize with trustworthy and synergistic AI4SE?

Vision 2033:

Symbiotic workforce of *autonomous, responsible, intelligent* bots and software engineers, creating a new way for us to engineer software
(Software Engineering 2.0)

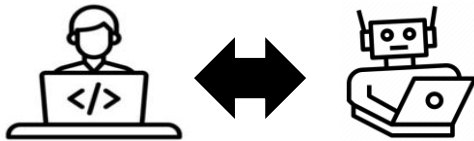
Vision: Software Engineering 2.0 (SE 2.0)

Symbiotic workforce of autonomous, responsible, intelligent bots and software engineers



Vision: Software Engineering 2.0 (SE 2.0)

Symbiotic workforce of autonomous, responsible, intelligent bots and software engineers



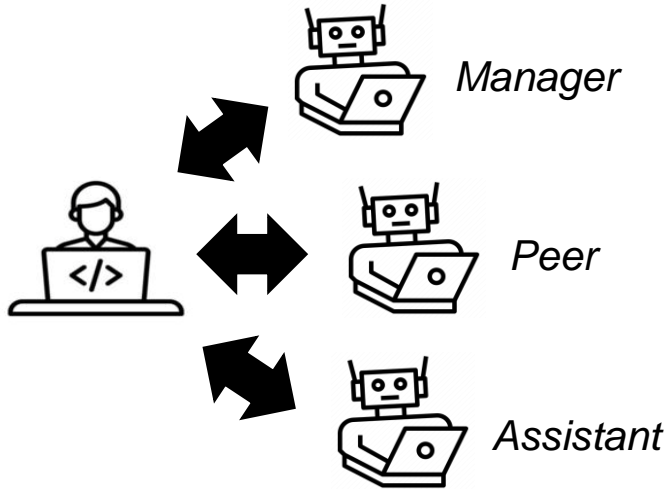
Smart Tool



Smart Workmate

Vision: Software Engineering 2.0 (SE 2.0)

Symbiotic workforce of autonomous, responsible, intelligent bots and software engineers



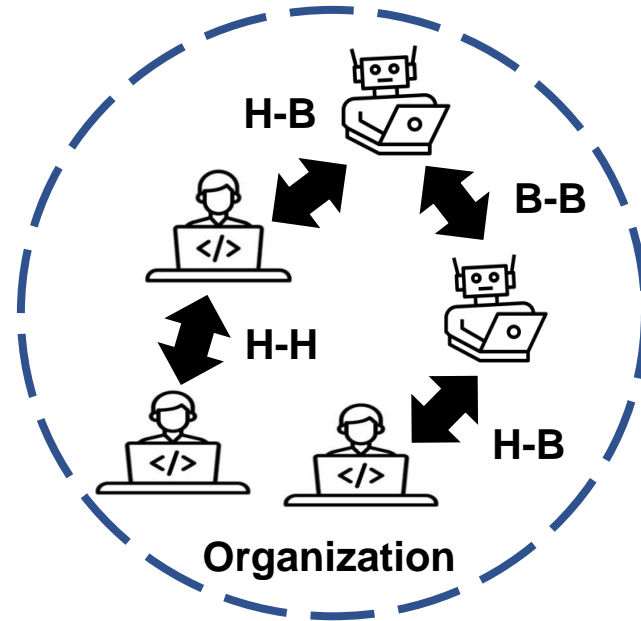
Smart Tool



Smart Workmate

Vision: Software Engineering 2.0 (SE 2.0)

Symbiotic workforce of autonomous, responsible, intelligent bots and software engineers



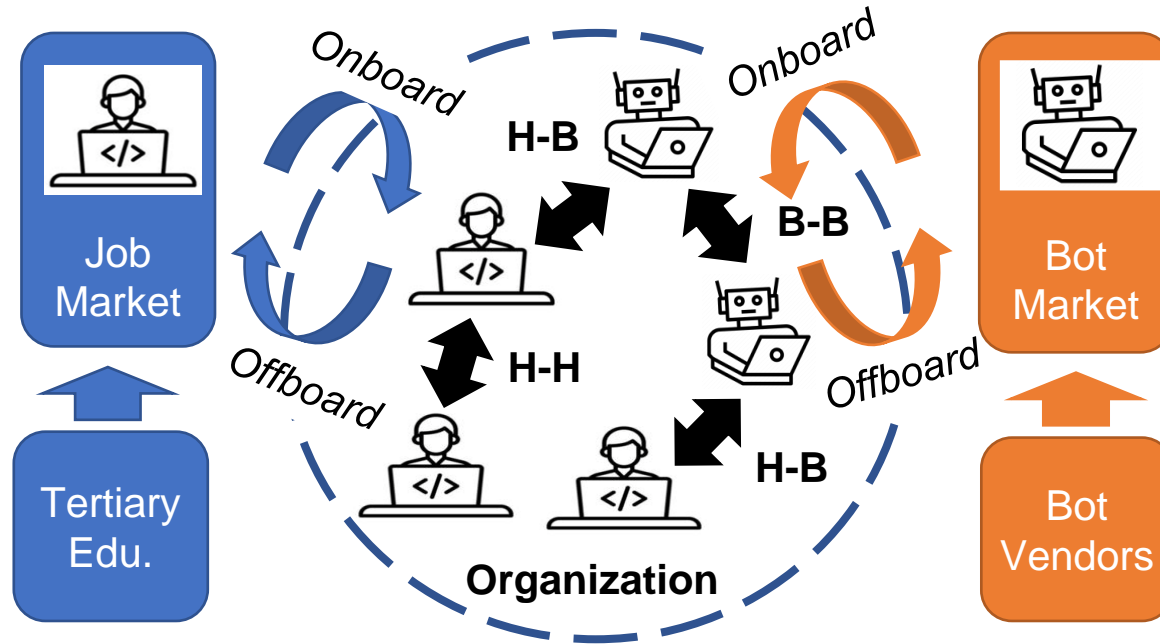
Smart Tool



Smart Workmate

Vision: Software Engineering 2.0 (SE 2.0)

Symbiotic workforce of autonomous, responsible, intelligent bots and software engineers



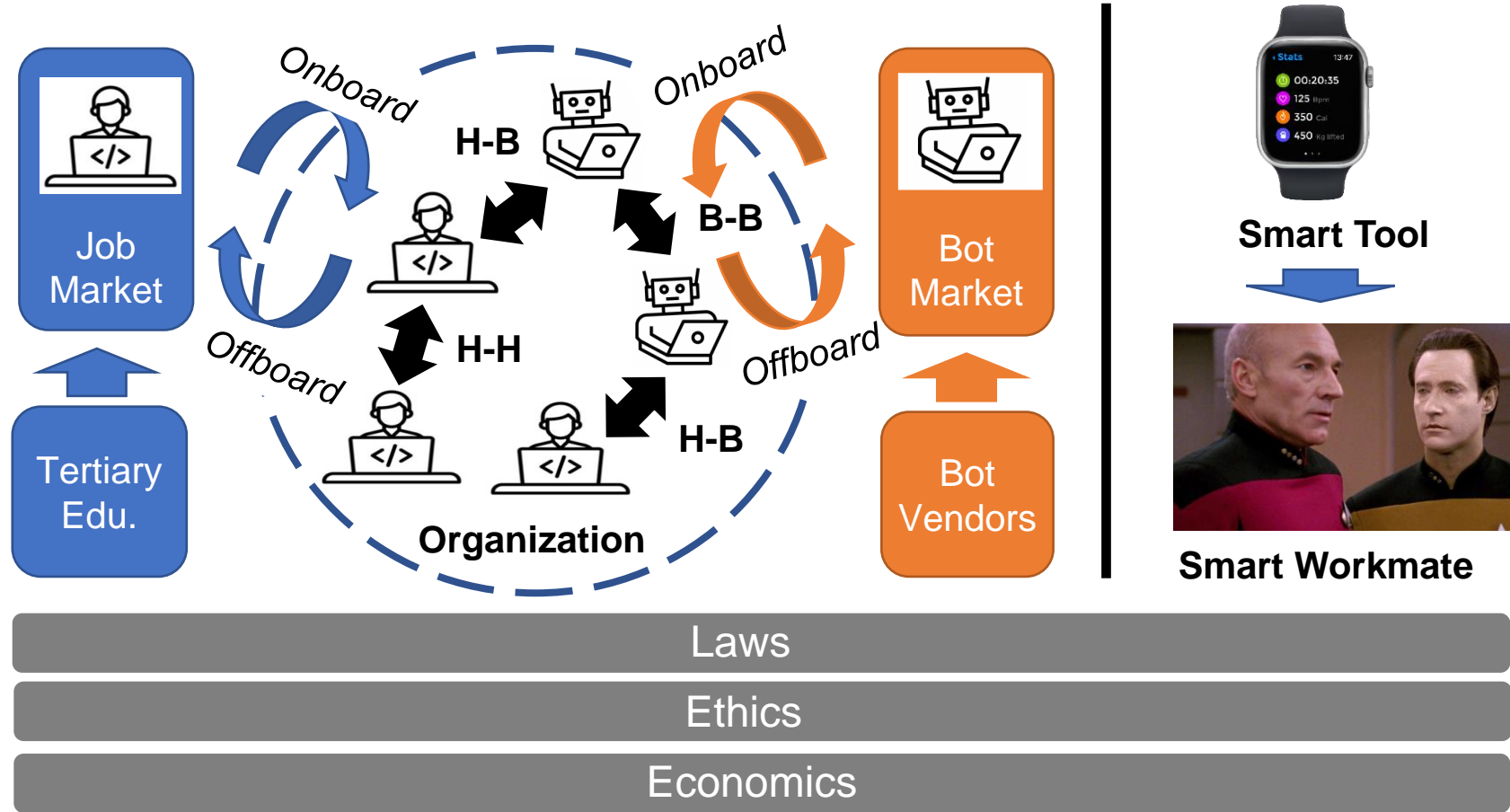
Smart Tool



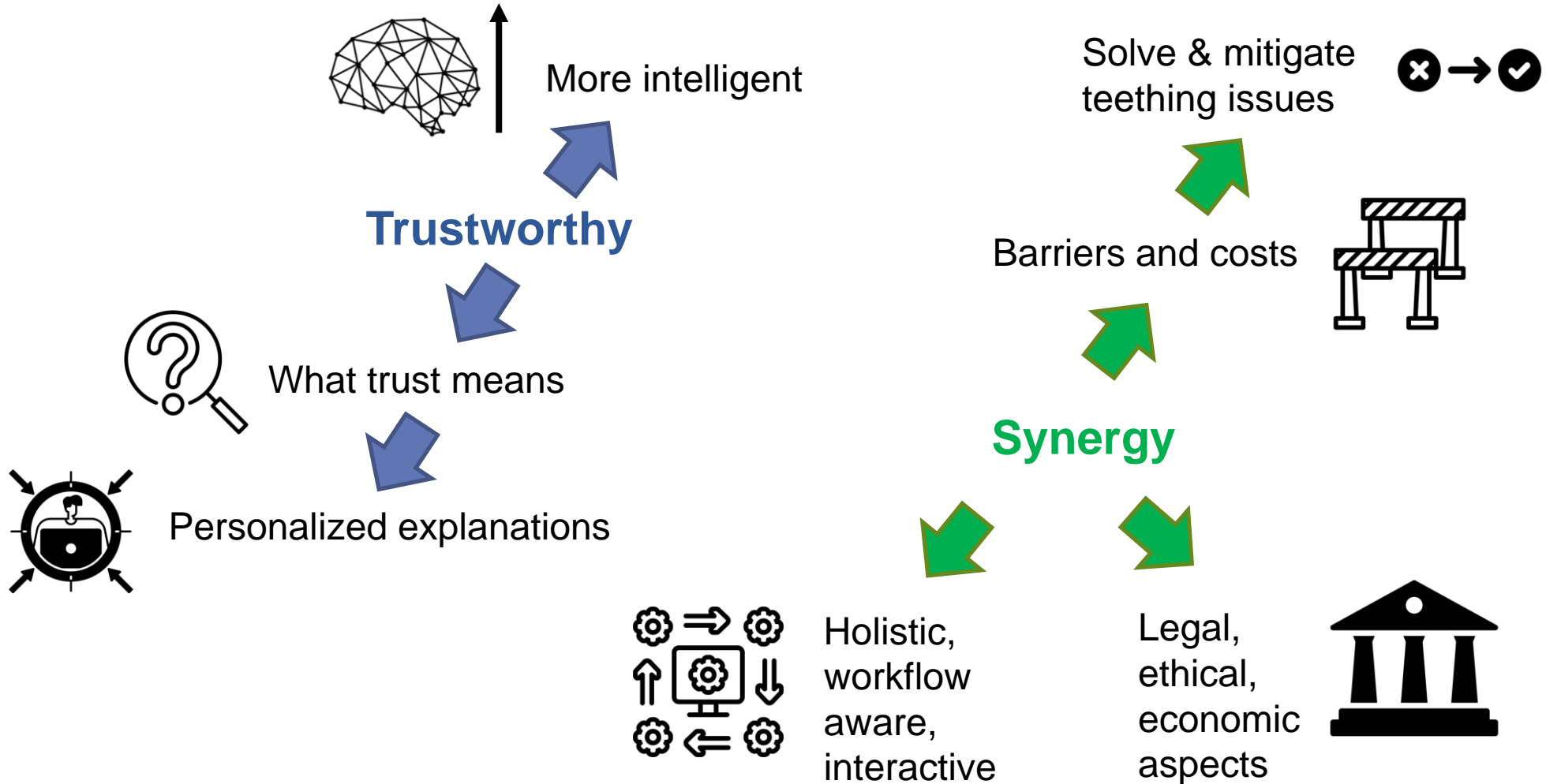
Smart Workmate

Vision: Software Engineering 2.0 (SE 2.0)

Symbiotic workforce of autonomous, responsible, intelligent bots and software engineers



How to make the vision a reality?



ARTIFICIAL INTELLIGENCE / TECH / LAW

The lawsuit that could rewrite the rules of AI copyright /

Microsoft, GitHub, and OpenAI are being sued for allegedly violating copyright law by AI. But the suit could have artificial intelligence.



INSIDER

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ChatGPT may be coming for our jobs. Here are the 10 roles that AI is most likely to replace.

Aaron Mok and Jacob Zinkula Apr 9, 2023, 11:36 PM GMT+8



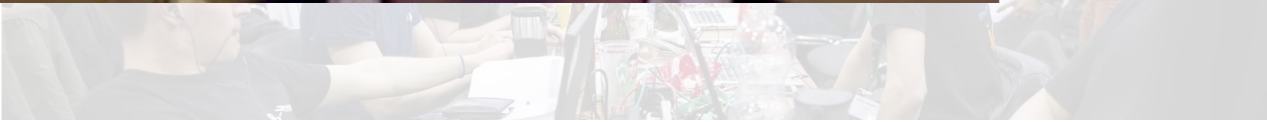
ARTIFICIAL IN
The lawsuit
Microsoft, C
violating co
AI. But the
artificial inte

AI pioneer quits Google to warn about the technology's 'dangers'

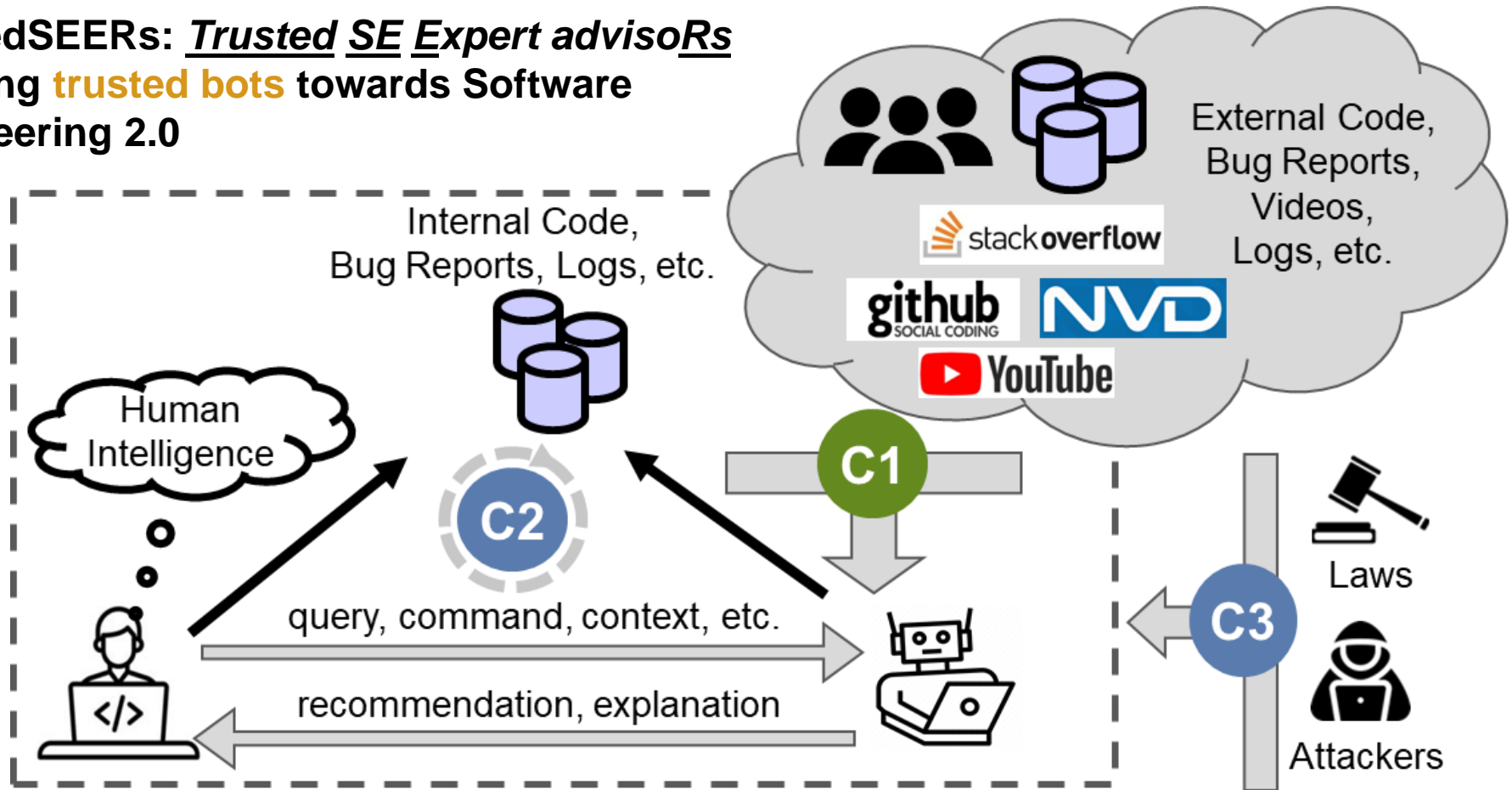


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Here are
place.



TrustedSEERs: Trusted SE Expert advisors Building **trusted bots** towards Software Engineering 2.0



NRF Investigatorship project, 2023-2028 (\$3.2M)
Individual research grant, similar to ERC Advanced



Thank you!

Questions? Comments? Advice?

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