IS AI RESHAPING THE WORLD?

AI agents will become first point of contact

AI is a rapidly changing technology, and new developments are taking place as I write this piece. Five years into the future, I envision AI as a technology that is more context-aware, relevant, responsible, and reliable. With this advancement, there is no doubt that people will go on to create large language models with more parameters. And if I look at customer interactions, especially relationship management, there will be better assistive tools, preparing ready answers to customers, for employees. AI will mature into autonomous agents representing the ethos and values of organisations, becoming the first point of contact for customers, employees and even investors.

Sindhu Gangadharan | MD, SAP LABS INDIA; VICE CHAIRPERSON, NASSCOM

The Age-Old Debate

SPEED!   UNRELIABLE!

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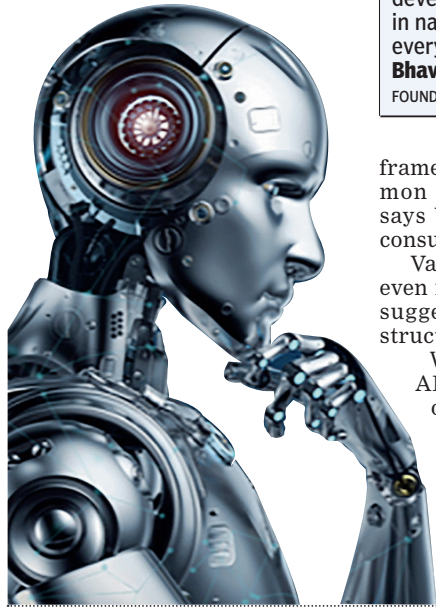SUNILAGARWAL@SUNILCARTOONS.COM

AI IS TRANSFORMING CODING

The models are only getting better at coding tasks, boosting productivity

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When we asked Sarvesha Palamwar, a young software deployment manager at Linecraft AI, a Wipro company, whether she was afraid of AI automation technologies taking away her job, she was unequivocal: "No, not at all." She says she's "extremely excited about how AI is actually going to change everyone's life, especially in the software sector."

Coders in many ways are on the front lines of the ongoing AI wave, and while there might have been some trepidation when generative AI first burst onto our collective consciousness a year and a half ago, the sentiment now is much more positive. A lot of that optimism stems from software developers getting to witness first-hand the productive potential of these tools.

"AI tools excel in scenarios involving repetitive or well-defined tasks, such as writing boilerplate code, unit tests, or standard API integrations. They significantly reduce the time and effort required for these tasks. When working on projects with codebases that the AI model has been trained on or is familiar with, these tools provide highly relevant and accurate suggestions. This is particularly useful for

frameworks, libraries, and common programming patterns," says Varun Rastogi, partner in consulting at Deloitte India.

Varun says these AI tools can even identify potential bugs and suggest improvements to code structure.

While the effectiveness of AI tools may vary depending on the scenario, their real value lies in how questions are framed to them, says Nibu Habel, principal engineer at NetApp India. "For known scenarios, AI tools often provide accurate and valuable insights. However, when faced with new and unknown challenges, multiple iterations of questioning may be required to obtain satisfactory answers. It is through this iterative process and feedback that the AI model continues to learn and improve its responses," he says.

Documentation, a necessary evil in a developer's life, has also been made easier with the help of AI, says Sujatha S Iyer, manager of AI in security at ManageEngine, a division of Zoho Corp. "As much as developers loathe the idea of writing documentation, they also need it to help them

quickly understand code written by fellow developers. This is where AI tools come in handy."

This is especially useful when you consider that multiple developers often must work together on a single project and building on top of code written by a fellow developer is quite usual. "Previously, it was difficult to go through each line to understand what a given piece of code did. AI tools have significantly streamlined the process by summarising what the code does in a concise manner, saving a great deal of time," Sujatha says.

Sindhu Ramachandran, direc-

THEY ARE A SECOND PAIR OF EYES

AI tools like Copilot and ChatGPT offer significant benefits when working with familiar code patterns and established frameworks. They excel at refactoring and debugging, and their ability to identify secure coding practices adds value. GitHub Copilot, in particular, has significantly accelerated my learning curve and strengthened my ability to contribute effectively. On average, I save approximately 20-25% of coding time with its assistance.
Bhagyashree Katti | SOFTWARE ENGINEER, DELL TECHNOLOGIES

For new products or services, especially in specialized domains like automotive, where domain-specific knowledge is crucial, the utility of AI tools may be limited. Without sufficient domain-specific training data, AI's ability to generate relevant and accurate code diminishes. In these scenarios, developers' expertise is crucial for tailoring solutions to the project's unique requirements.
Abinaya Janakiraman | PROJECT MANAGER/DELIVERY LEAD, BOSCH GLOBAL SOFTWARE TECHNOLOGIES

With the advent of AI, coders are not just coding, they're navigating a whole new world, learning new tools and technologies. GitHub Copilot recently introduced a new extension. It introduced AI tools and services integrated into Copilot Chat. Basically, it means that Gen AI suggests codes as the developers writes. The developers can also build and deploy in natural language! AI is transforming every layer of the tech stack.
Bhavesh Goswami | FOUNDER & CEO, CLOUDTHAT

One should be careful while relying on AI for creative thinking, critical problem-solving, or architectural decisions. For instance, you can't treat it like an engineer or magic software that will give you full-fetched working code in all scenarios. I was working on a Manim Python library and used ChatGpt: it was able to help initially with the boilerplate, but the code generated was full of bugs and incorrect.
Meghna Yadav | SOFTWARE DEVELOPMENT ENGINEER 2, SCALER

There are many tools available which are great for suggesting code completions and handling boilerplate tasks. This frees up time to focus on the real brain teasers - designing the overall architecture and solving those tricky logic problems. Some AI tools can also help identify potential bugs in code in real time. There's nothing worse than spending hours debugging a cryptic error, so having AI act as a second pair of eyes is a huge advantage.
Varun Rastogi | PARTNER, CONSULTING, DELOITTE INDIA

As a software developer, I rely heavily on documentation, tutorials, and forums like Stack Overflow for troubleshooting and learning new technologies. These resources are essential for my day-to-day work, but they can also be pretty time-consuming. With AI tools like GitHub Copilot and AI Code Companion, my workflow has become much smoother. I get help with code suggestions, auto-completion, and error detection, which makes my job a lot easier.
Apoorva Srivastava | SENIOR EXPERIENCE ENGINEER, PUBLICIS SAPIENT

tor of technology and head of the centre of excellence for AI at Quest Global, says programmers should view AI tools as an assistant developer working alongside them, and that it's important to maintain a balance between leveraging AI and developing independent coding expertise. "AI source generation technologies, in their current state of maturity, are better suited for developing rapid proofs of concept, source code translation, and test case generation – both unit and functional."

They are also powerful levellers and could potentially expand the pool of software creators in the future, adds Sindhu. "AI-powered low-code/no-code platforms have led to the democratisation of coding and are making it easier for non-programmers to build basic applications."

Aside from Github Copilot and ChatGPT, which are the two most popular code generation tools, there are a lot of AI tools out there for coders. Athreya Ramadas, cofounder & CTO of Rapyder, says that one of his favourite tools is Codewhisperer by Amazon. "Some features like code suggestion filtering to avoid unintentional use of external code, and a built-in security scanner, etc. are great differentiators."

DOUBLE-EDGED SWORD

For all of the advantages that genAI tools have conferred upon coders, it can still be a double-edged sword, especially for freshers, says Praveen Baskaran, head of R&D for vision care India at Zeiss Group. "I would always recommend freshers to go for a hybrid approach, where they learn to use the AI tools while learning the programming languages themselves."

This, Praveen says, is to ensure that novice software developers retain the ability to check and review the integrity and accuracy of the code generated by these AI tools. Considering the pace of advancement, Praveen says that in five years, it's possible that AI code generators will not require reviews. "But right now, I would encourage freshers to learn programming languages and use AI tools to increase their productivity."

Content creators have a great new path in chatbots

Leadership coach Marshall Goldsmith (second from right), with Fractal executives (L-R) Jay Amin, Srikanth Velamakanni, and Nikhil Arora. Fractal has used genAI to create MarshallBot, an AI-powered virtual coach that allows Marshall's thoughts to reach a far bigger audience, and even when physically he's no longer around. It's also available in Marshall's voice; soon in video form too

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Jay Amin asks Marshall-Bot: 'Hi Marshall, my subordinates are unhappy with my performance, what should I do?' and the bot in a clear voice responds: 'Hello, it's important to address the concerns of your subordinates with sincerity and a commitment to improvement. Here's what I recommend,' and goes on to provide several pieces of advice.

Jay is part of the team at Mumbai-based Fractal Analytics that has built the bot, an effort by globally renowned leadership coach Marshall Goldsmith to reach a larger audience. Marshall is 75 and wants to give free access to his thoughts, even when he's physically no longer around. Fractal founders Srikanth Velamakanni and Pranay Agrawal were beneficiaries of Marshall's coaching, and the bot is a guru dakshina.

Jay says when genAI emerged, this project became feasible, because the data included over a million words from Marshall's writings, and only genAI and LLMs could have got the accuracy in answers that Marshall wanted. Each time a question is asked, the LLM searches the 1 million words to find the right content, and then it puts together the right answer based on its reasoning capabilities. Marshall says 60% of the time, the bot can answer a question in his area of expertise better than he can. "In about three seconds, it can provide an answer that would take me hours to mull over," he says.

MarshallBot is available in text, as also in Marshall's voice, and soon it will even have Marshall's video image answering questions. Mar-

shall and Fractal wanted to build a really high-quality bot, given reputational risks. So they had to bring in AI scientists and engineers to build the bot, especially for the audio and video versions.

Simple text

But if you want to build a simple text-based custom GPT, it's easy. Utkarsh Rai, a leadership coach, has done it. He put all of his data in PDF formats, uploaded it onto ChatGPT. Training the system – which involves asking questions, checking the answers, and fine-tuning them if they are not exactly as you want them – took about four hours for three weeks. He made it public in April, and he's continuously improving it with new data and fine-tuning answers.

Jay and Utkarsh say costs are very reasonable, and are dropping fast.

How to build your custom CHATBOT

- You may need a subscription with most GPTs
- Starting off only requires filling in some details like name, category
- Then upload all your relevant files (multiple file formats are accepted)
- Training the system to answer accurately takes the most time – but no coding, it's just a matter of keying in questions, checking the answers provided, and rewriting answers you are not satisfied with
- Once you are confident the answers are reasonably accurate, you can do a public release
- Keep updating and training based on new data

In the future, content creators may be able to generate revenue based on usage. For example, someone could compile all of Einstein's work into a custom GPT, enabling people to ask questions like, `I'm struggling to understand the theory of relativity in this context, you can help explain it?'
Utkarsh Rai | LEADERSHIP COACH, FORMER MD, INFINERA, INDIA & CHINA

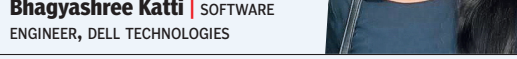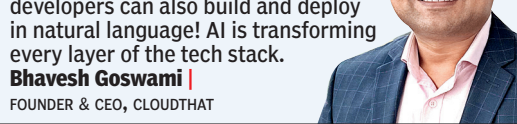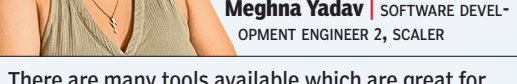## "This is a special time, take advantage of it"

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"My biggest piece of advice is, this is a special time and take advantage of it," Sam Altman, OpenAI's CEO, said during the Microsoft Build 2024 conference held in Seattle recently. "This is not the time to delay what you were planning on doing or wait for the next thing."

Altman, who has gained an almost cult following ever since ChatGPT was released, also emphasised that AI models are only going to get smarter from here on and that we should all be prepared for that.

"The most important thing sounds like the most boring, obvious, trite thing I can say, but I think it is actually much deeper than it sounds. The most important thing is that the models are just going to get smarter — generally, across the board."

Kevin Scott, Microsoft CTO, said there is no point where diminishing marginal returns will kick in and that we can all count on these AI models getting more robust and cheaper at a pretty aggressive clip over time. "There's this really beautiful relationship right now between the sort of exponential progression of compute that we're applying to building the platform to the capability and power of the AI that we get."

Microsoft CEO Satya Nadella announced that developers will soon be able to code in their native language, including in Hindi, and not just in English.

This is probably the most exciting time to be building a product or a startup, at least since the mobile boom...the big opportunities and the ability to build something new and really change the landscape comes at these platform shift times, and we haven't had a platform shift in a while and this looks like it's truly a platform shift. And so, my biggest piece of advice is that this is a special time and to take advantage of it.
Sam Altman | CEO, OPENAI

THEY ENABLE AUTHENTIC LIP-SYNCS IN DUBBED VIDEOS

NeuralGarage founders (L-R) Subhashish Saha, COO; Anjan Banerjee, chief of product; Subhabrata Debnath, CTO; and Mandar Natekar, CEO

▶ Three years ago, IIT Kanpur alumni Subhabrata Debnath, Subhashish Saha, and Anjan Banerjee joined forces with media industry veteran Mandar Natekar to establish **NeuralGarage, a venture that uses GenAI to create realistic dubbed versions of videos.**

▶ Subhabrata, Subhashish, and Anjan, who have been acquainted since 2013, previously collaborated on a facial recognition company called VisageMap after graduating in 2015. The company was later acquired by US firm FaceFirst.

▶ **Anjan, an avid consumer of Korean content, noticed that while dubbed content increases accessibility, it also creates a visual dissonance** that hinders the viewing experience, as the dubbed audio does not synchronise

with the actors' mouth movements. "The three of us got together and decided to solve this. We had reached out to Mandar through a common connection to understand the value it brings to the media industry and whether it is something the industry would be willing to pay for. After visiting around 30 studios and meeting with various producers and directors, we realised the solution is very much needed," Subhabrata says.

▶ Their flagship product, **VisualDub, can alter the lip and jaw movements of actors at studio quality, using audio as a controller.** It takes two inputs: the original video and the new dubbed audio. By utilising activations from the audio, it adjusts the lip, jaw, chin, cheeks, and even smile lines to match the new audio. "Our algorithm has

learnt the relation between sounds and lip movements (phoneme - viseme map) using millions of data points. And using this learning, it can transform any face using audio activations," Subhabrata says. It's like you're watching Money Heist in English where the actors visually speak it.

▶ **The tech also enables hyper-personalisation.** From one video message where an actor is speaking, it can create millions of videos at scale each personalised to a specific user by changing a few variables in the message (say name, age), such that it seems that the video message was specifically meant for them.

▶ NeuralGarage is working with brands like **Amazon, Britannia, Coca-Cola, HP, and Microsoft US.**

NEURAL NETWORKS ARE MODELLED AFTER THE HUMAN BRAIN

Neural networks are a subset of machine learning models inspired by the human brain's structure and function. They consist of layers of interconnected nodes, or "neurons," which process input data to generate output predictions. Each neuron receives one or more inputs, applies a weighted sum, and passes the result through an activation function to produce an output.

A typical neural network has an input layer, one or more hidden layers, and an output layer. The input layer takes in the raw data. Each subsequent hidden layer processes the data further, extracting features and patterns through learned weights and biases. The final output layer generates the prediction or classification based on the processed information from the

hidden layers.

Training a neural network involves adjusting the weights and biases to minimise the error between the predicted and actual outputs. This process is done through an algorithm called backpropagation, which calculates the gradient of the loss function (a measure of prediction error) and updates the weights accordingly using an

optimisation method like gradient descent.

Neural networks excel in tasks involving large and complex datasets, such as image and speech recognition, natural language processing, and game playing. They are capable of capturing intricate patterns and relationships within data, making them powerful tools for a wide range of applications.