

Leveraging GenAI for Code Generation

Student Training Workshop (UTS)

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Overview

- 1 The Landscape
 - Challenges in Learning to Code
 - The programming language is human
 - Features to Consider in Text-to-Code Generators
- 2 Writing Effective Prompts
- 3 Benefits of Using LLMs for Coding
- 4 Additional Tools
- 5 Key Takeaways

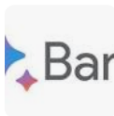
The Landscape of Text-to-Code GenAI



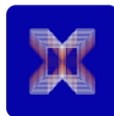
GitHub
Copilot



Microsoft
Copilot



Gemini



OpenAI
Codex



Claude



ChatGPT

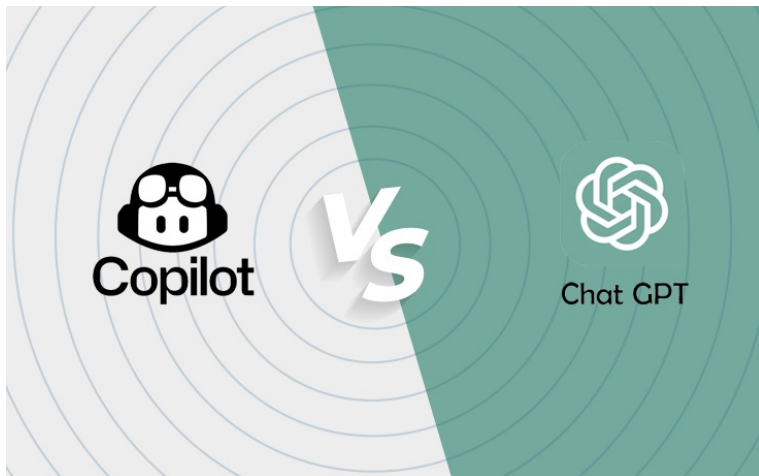
Other contenders:

- Replit
- Tabnine
- Refact.ai
- Codeium
- Amazon CodeWhisperer
- Perplexity

There are, of course, many many more... but some may not be ideal for beginners. Comprehensive reviews:

- Best AI Chatbots for Coding in 2024:
<https://www.geeksforgeeks.org/ai-chatbots-for-coding/>
- A few other variants: <https://www.locusive.com/resources/best-generative-ai-tools-and-chatbots-for-coding>

Which one do I choose?



Challenges in Learning to Code

- Abstract and complex **concepts**
 - Understanding **programming logic**, **data structures**, **algorithms**
 - Mapping finance concepts to code **implementation**
- **Syntax** and language rules
 - Remembering and applying **syntax rules** correctly
 - Dealing with **multiple programming languages** (=confusion)
- Problem-solving and **debugging**
 - Breaking down complex problems into coding solutions
 - Identifying and fixing **errors in code**
- Lack of **engagement and motivation**
 - Traditional teaching methods can be dry and theoretical
 - Difficulty in seeing practical applications in finance
- Time and resource **constraints**
 - Balancing coding with other coursework
 - Limited access to coding **resources/support**
- Transition from **theory to practice**
 - Applying **theoretical knowledge** to real-world coding problems
 - Developing **practical coding skills** and experience

Interview with NVIDIA's CEO

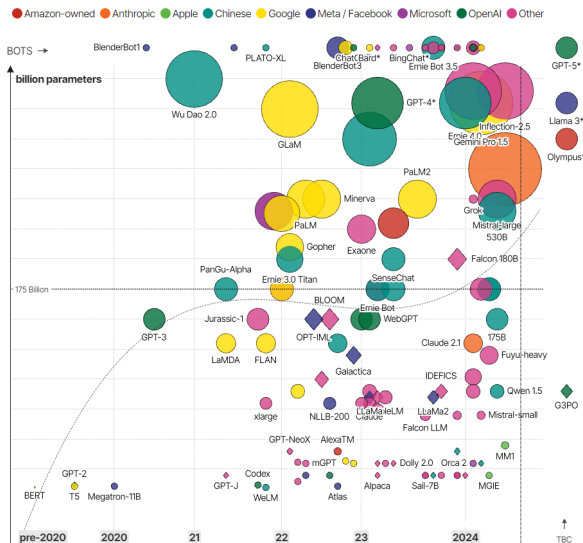
[▶ YouTube clip](#)

World Governments Summit 2024, 12-14 February



- *I'm going to say something, and it's going to sound completely opposite of what people feel. You probably recall, over the course of the last 10-15 years almost everybody who sits on a stage like this would tell you it is vital that your children learn computer science. Everybody should learn how to program. And in fact, it almost exactly the opposite.*
- *It is our job to create computing technology such that nobody has to program. And that the programming language is human.*
- *Everybody in the world is now a programmer. This is the miracle. This the miracle of artificial intelligence. For the very first time, we have closed the gap. The technology divide has been completely closed. And this is reason why so many people can engage artificial intelligence.*

Evolution of Large Language Models (LLMs)

[▶ Explore Interactively](#)


Features to Consider in LLM Code Generators

- **Intelligent Code Completion**
- **Syntax Error Detection**
- **Language Support**
- **Integration**
 - with popular programming environments and IDEs like Visual Studio Code or GitHub
- **Learning and Adaptation**
 - Gradually learn and adapt to a user's unique coding preferences over time, providing more personalised suggestions
- **Code Refactoring**
 - Models that offer code refactoring suggestions can help improve the overall quality of code = more effective learning

ChatGPT and AI guides

The better title:
“AI Conversations:
Yesterday’s News
Today”

Some of the top
sellers:



Dymocks on Collins st

Benefits of Using LLMs for Coding

- Personalized learning experience.
- Immediate feedback and assistance.
- Bridging the gap between theory and practice.

Writing Effective Prompts

- Be specific about the task and desired outcome.
- Use clear and concise language.
- Iterate and refine prompts to improve responses.
- Follow up with "Ask me any questions..."

AI-aided prompt solution:

- Prompt Wizard [▶ My example](#)
 - <https://chatgpt.com/g/g-D5BXGtreN-prompt-wizard>

Additional Tools

futuretools - collects and organizes AI tools.

- <https://www.futuretools.io/?tags-n5zn=generative-code>

Convert Anything - Converts files into different formats.

- <https://chatgpt.com/g/g-kMKw5tFmB-convert-anything>

Video Tutor - Tutors you based on chosen YouTube videos in any language. Generates educational summaries, articles, quizzes, diagrams and answers questions. Paste the link to any YouTube video, and this GPT outputs a useful, concise summary of it. The best part is that you can also drill down into certain aspects and parts of the video if you need more detail.

- <https://chatgpt.com/g/g-GvcYCKPIH-video-tutor>

Key Takeaways

- Treat GenAI as an intern
- Make sure your prompts are clear
- Use AI-Generated code solely as a starting point
- Give AI-Generated code the same scrutiny as Human-Written code
- Frame AI as an accelerator, not a replacement

Q&A

Questions?
Suggestions?
Your experience?
Discussion?

