

香港中文大學（深圳）
The Chinese University of Hong Kong, Shenzhen

CSC4801
AI-assisted Software Engineering

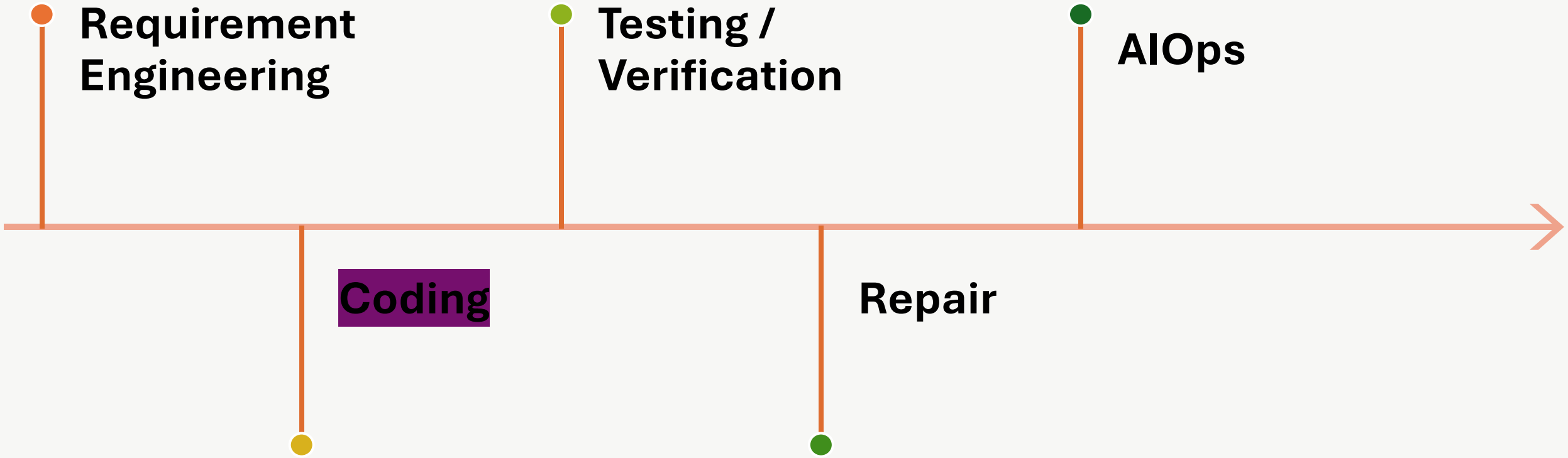
Lecture 11: Beyond Chat

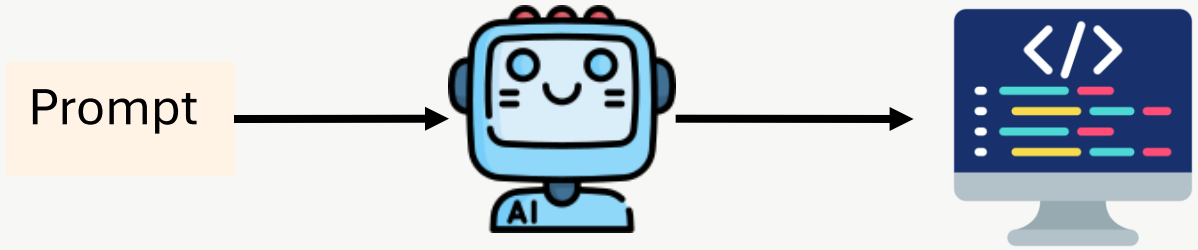
Instructor: Jinsheng Ba | 2026 Fall

Quiz I

- 10/22 Thursday
- 8:30-9:00 Lecture
- 9:00-10:00 Quiz
  - USE your own pens
  - NO electric devices
  - NO cheat sheet

AI-Assisted Software Engineering



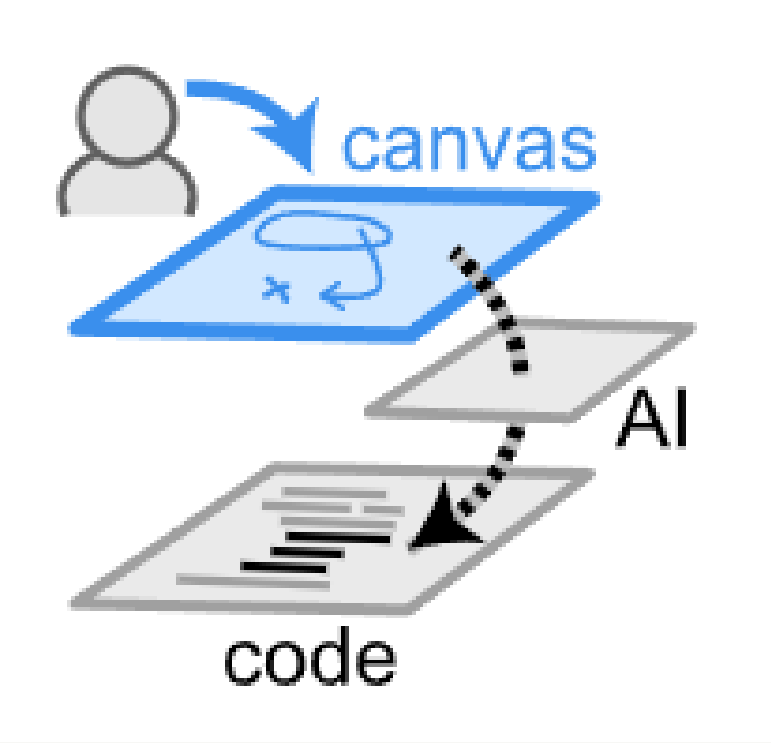


Is chatting the only way to write code?


神笔代码
HelloWorld.py
Create Mountain
Draw Code
神笔代码
Coding Magic
Coding Magic
神笔代码

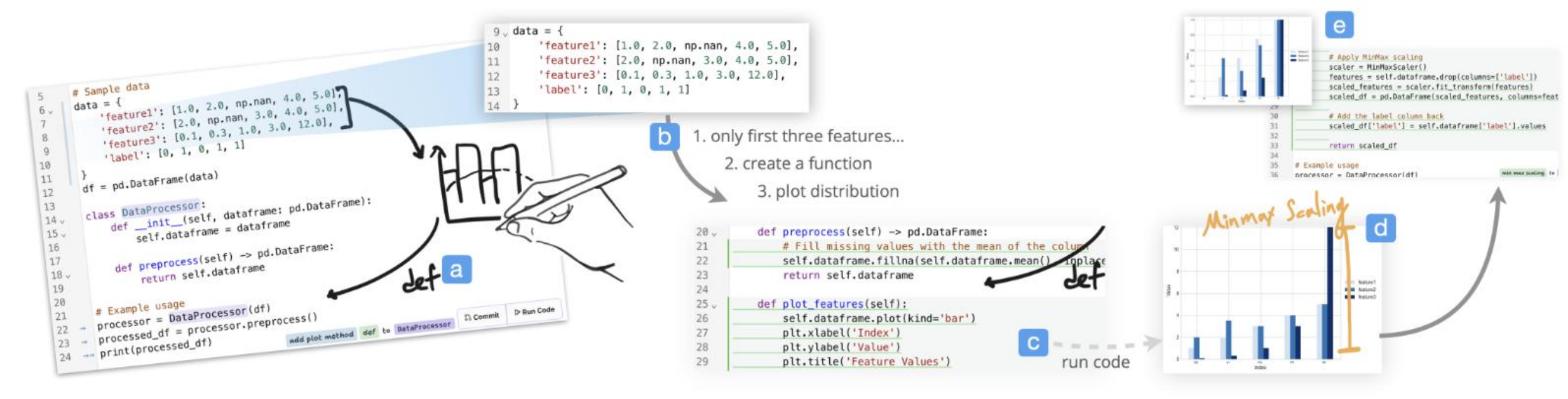
We could draw the specifications to generate the code!

Code Shaping

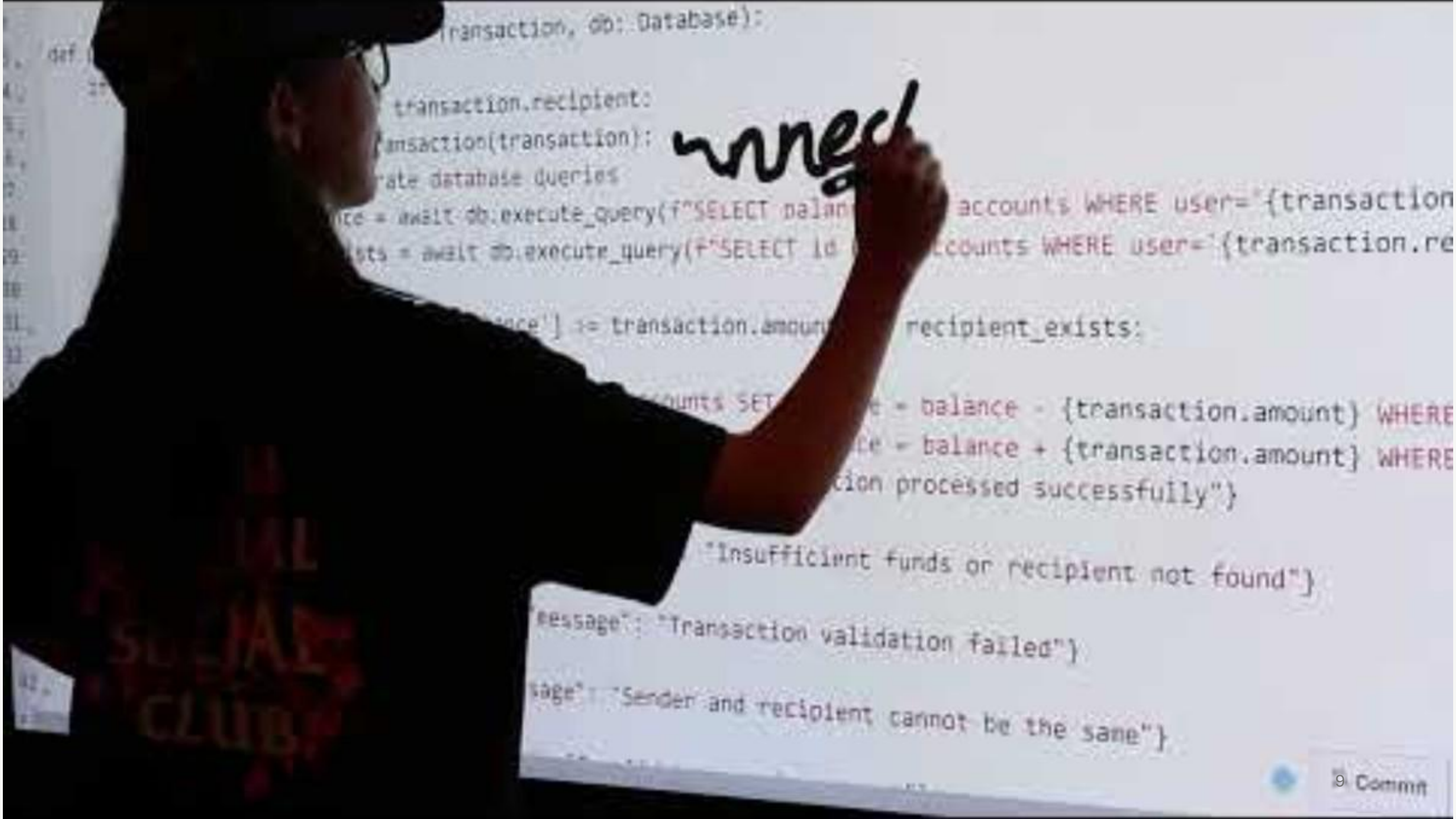


https://arxiv.org/pdf/2502.03719

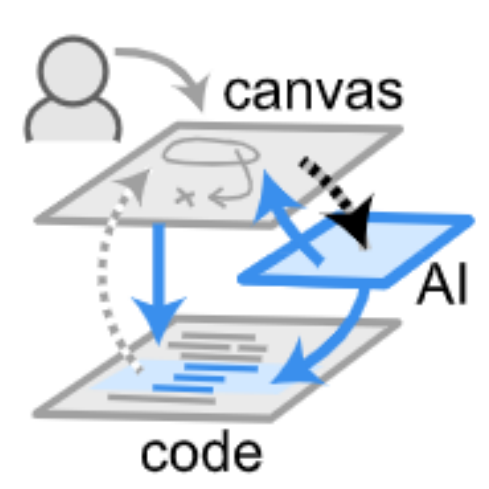
Code Shaping

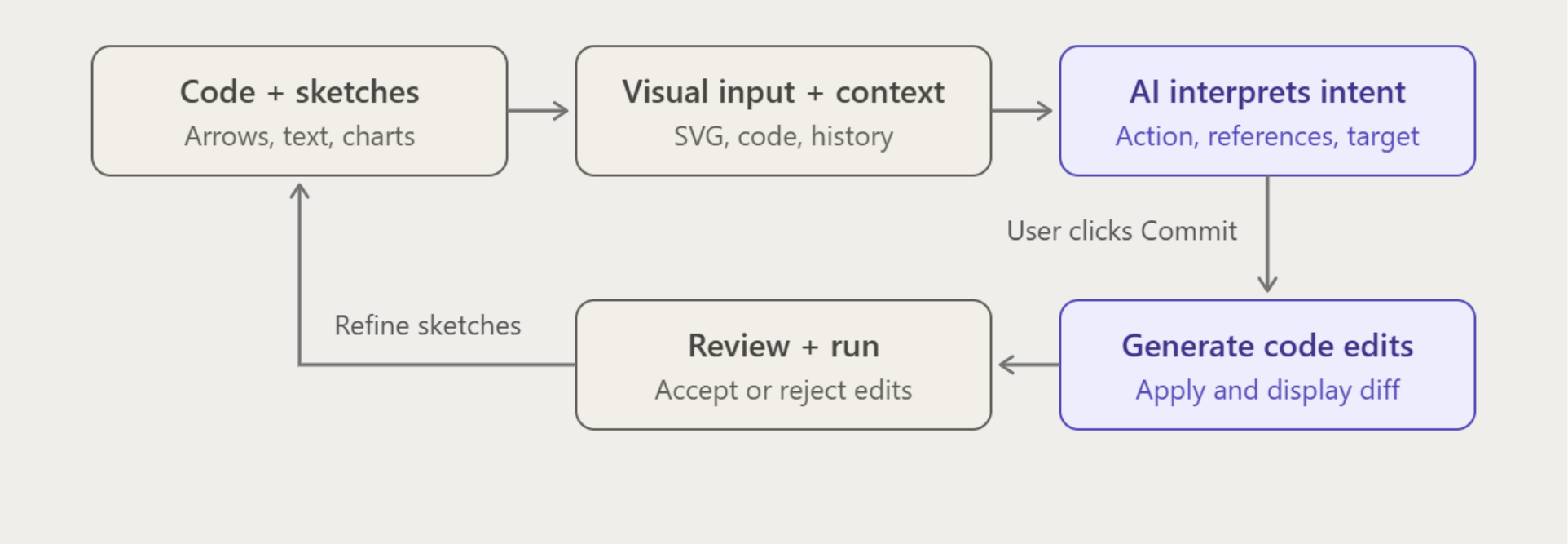


https://arxiv.org/pdf/2502.03719


transaction, db: Database):
transaction.recipient:
ansaction(transaction):
rate database queries
accounts WHERE user='{transaction
recipient_exists:
balance - {transaction.amount} WHERE
balance + {transaction.amount} WHERE
tion processed successfully"}
"Insufficient funds or recipient not found"}
Transaction validation failed"}
Sender and recipient cannot be the same"}

Architecture





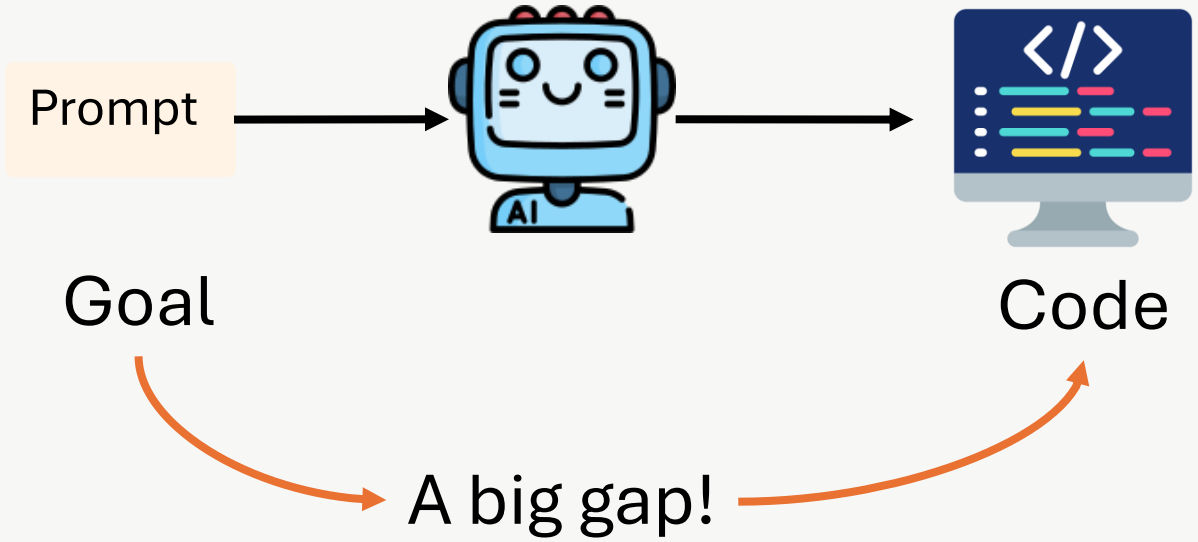
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Discussion

- Application Domain
  - Data analysis
  - Education
  - Exploration coding
  - Collaboration
- Limitations
  - Figure identification accuracy
  - Producibility
  - Limited to small code
  - Code understanding

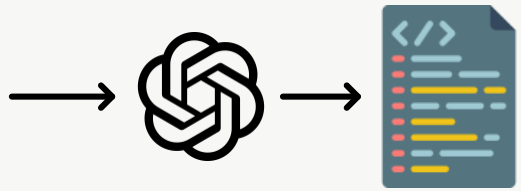
Discussion

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- Limitations
  - Figure identification accuracy
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Prompt
AI
Goal
Code
A big gap!

Code Semantic Zooming

Prompt: Implement a 2048 game with ***AI support***.

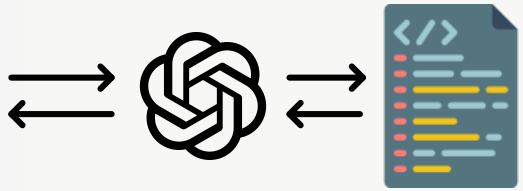


main.py.pseu

```
GOAL: Run the 2048 terminal game;
Dependencies: board.py.pseu, AI/expectimax.py.pseu;

STEPS:
  Ask board-size choices, win-target choices, mode;
  Read user selections, create Board with chosen size;

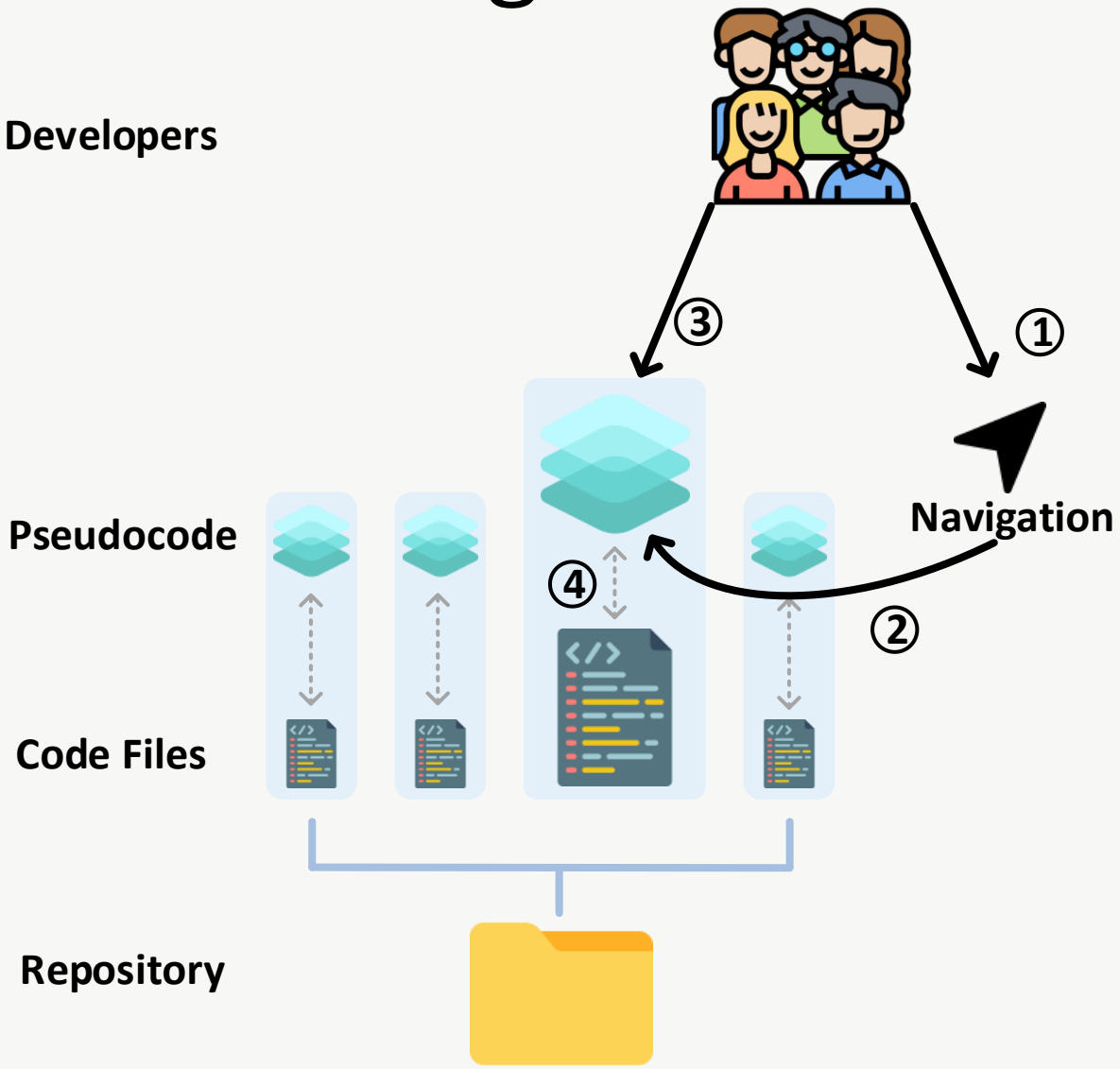
  if (human mode) {
    while (playing) {
      Process user interaction and commands;
    }
  } else if (AI mode) {
    while (playing) {
      Choose best move, apply it, spawn tile;
    }
  }
```



User Interface **LLM** **Source Code**

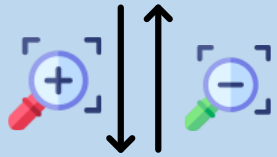
https://arxiv.org/pdf/2510.06452

Code Semantic Zooming



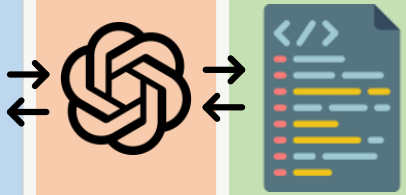
main.py.pseu

```
1  GOAL: Run the 2048 terminal game;
2  Dependencies: board.py.pseu, AI/expectimax.py.pseu;
3
4  STEPS:
5    Ask board-size choices, win-target choices, mode;
6    Read user selections, create Board with chosen size;
7
8    if (human mode) {
9      while (playing) {
10       Process user interaction and commands;
11     }
12   } else if (AI mode) {
13     while (playing) {
14       Choose best move, apply it, spawn tile;
15     }
16   }
```



main.py.pseu (zoom in)

```
8  ...
9      while (playing) {
10       Render board with score and remaining time;
11       if (key == w/a/s/d) {
12         apply move, spawn tile, update score;
13       }
14       elif (key == quit) { exit; }
15     }
16 ...
```



main.py.pseu

LLM

main.py



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Questions

Next class: Validation