The Evolving Role of the Software Engineer in the Age of GAI

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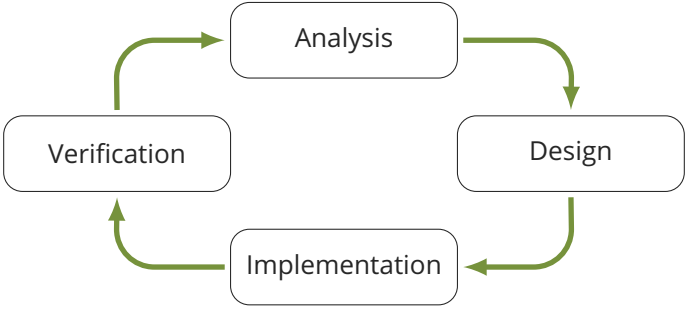
Software Engineering

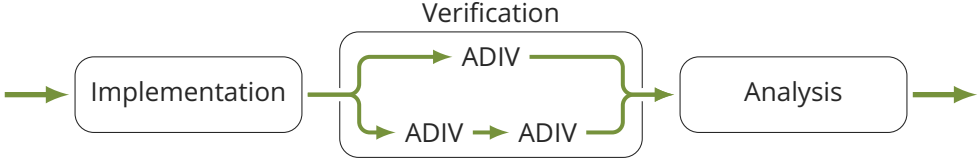
Engineering

- Iterative process of Analysis, Design, Implementation, and Verification.
- Iterations can take from seconds up to decades.



Engineering

- Iterative process of Analysis, Design, Implementation, and Verification.
- Iterations can take from seconds up to decades.
- Each step itself may contain multiple iterations in parallel or in sequence (e.g. creating tests during Verification).
- Nesting can be very deep.



Down the Engineering Rabbit Hole

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Answer

- When there already exists a (good enough) solution.
- Caveat: Sometimes engineering means picking the best trade-off out of many bad solutions.

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1 #include <algorithm>
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3 std::sort( ... );
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Problem

- What if a problem was solved, but not in a way that fits?

Generative AI

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ChatGPT

Generative AI refers to a class of artificial intelligence systems that can create new content — such as text, code, images, audio, or video — by learning patterns from large datasets.

Wikipedia

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Summary

- Generates new data based on learned patterns.

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Summary

- Generates new data based on learned patterns.

Important

- Repeats or rehashes existing patterns.
- Does not do engineering.
- Only as good as the data it was trained on.

Problem with Patterns – An Example

Can you generate a picture of a plane without windows?

Some Observations

- Still has windows.
- Below the clouds.

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- All actual planes have cockpit windows.
- Most pictures of planes are taken during takeoff and landing.

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Training data might have a bias that requires special knowledge to recognise.

Claims

- The role of software engineers does not fundamentally change.
  GAI is just a new type of tool.
- GAI allows engineers to generate custom instances of well known solutions.
- GAI will require from engineers to put more effort on verification and to be aware of shortcomings in training data.

Does it work?

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Some Results

- 26.08 % increase in completed tasks
  Cui et al.: *The Effects of Generative AI on High-Skilled Work: Evidence from Three Field Experiments with Software Developers* (2025)
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Hard to say for now.

- Too few studies and too many variables.
- Rapidly evolving field.
- Engineers are still learning how to best use GAI.

Thank You!