[ITMO-CT-2024-Spring] Computational Process Organization

Essay 1

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23.04.2024

After studying the learning materials, I learned some of Bret Victor 's views on future programming and his insights on its development direction. Another learning material details the overview of each programming language and its characteristics. Following is my views on this topic.

Visual Programming

Visual programming simplifies software development by using intuitive graphical interfaces that allow developers to manipulate data and control processes visually. This approach enhances understanding of data structures and program execution, making programming and debugging more convenient. Tools like Figma, Adobe XD, and Webflow are transforming front-end development by enabling seamless design-to-code transitions and fostering collaboration between designers and developers. Although not yet fully mainstream, these tools show promising development and the potential to democratize software and website creation.

Goal-Oriented Programming

Goal-oriented programming, or declarative programming, focuses on defining "what to do" rather than "how to do it," letting computers handle more of the implementation details. This frees developers to concentrate on problem-solving. Advances in AI are crucial here, as AI can translate complex requirements into code, especially using natural language processing. While AI primarily executes and optimizes existing algorithms rather than inventing new ones, it's becoming a key executor in software development, pushing the industry towards more innovation-focused roles for developers.

Parallelization

Parallelization enhances computing efficiency by allowing multiple tasks to run simultaneously. At the hardware level, this is achieved by integrating more processors into chips and optimizing designs for multi-threaded execution, improving performance for complex calculations. At the software level, techniques like multi-threaded programming and using GPUs for parallel data processing enable developers to leverage modern multi-core processors, accelerating application performance.