

The emergence of transformer-based architectures has fundamentally altered the landscape of computer science research. Large Language Models (LLMs) are no longer viewed merely as sophisticated autocomplete engines; they have evolved into versatile tools for code generation, bug detection, and automated documentation. Recent studies indicate that integrating neural networks into the Integrated Development Environment (IDE) significantly reduces the cognitive load on developers. By leveraging attention mechanisms, these models can understand long-range dependencies within complex codebases, providing context-aware suggestions that traditional static analysis tools often miss. However, challenges regarding data privacy and the potential for hallucinated syntax remain critical areas of investigation. As we move toward autonomous coding agents, the focus of computer science education must shift from rote memorization of syntax to high-level architectural design. Future research should prioritize the development of smaller, more efficient models that offer high performance with lower computational overhead.