A Novel Approach to Generative AI-based Optimized Code Generation for Semiconductor Equipment Interfaces

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***Abstract*— Generally, standardization defined by the SEMI association is well established and utilized in the semiconductor industry. In particular, most semiconductor equipment supports SECS / GEM communication protocols, and the automation and smart factory construction consist of equipment communication control programs using these standard protocols. We propose to improve development efficiency by automatically generating control program code using generative artificial intelligence technology to develop interface programs that control these semiconductor facilities. In addition, to improve the completeness and utilization of the automatically generated code, this paper presents a method to automatically generate semiconductor equipment control interface codes through generative artificial intelligence based on existing codes and minimize the constraints that may occur due to the hallucination effect, which is a significant weakness of generative artificial intelligence.**

***Keyword*— Generative AI, Code Generation, LLM (Large Language Model), RAG (Retrieval Augmented Generation), Prompt**

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