Leveraging Large Language Models for Direct Interaction with SysML v2

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Abstract. This paper examines the potential integration of Large Language Models (LLMs) with the Systems Modeling Language version 2 (SysML v2), proposing a novel methodology for systems engineering by capitalizing on the enhanced readability and human-friendly syntax of SysML v2. Given the emergent sophistication of LLMs and the coincidental development of SysML v2—an endeavor that presents a pivot toward naturally articulated model interaction—we explore the possibilities and implications of such an intersection. Our investigation posits that LLMs can serve not only as an interpretive layer, allowing for the syntactically simplified manipulation of system models, but also as a catalyst for a knowledge-driven design approach.

We highlight the efficiencies gained by deploying LLMs for SysML v2 interactions, which reduce the dependency on technical expertise traditionally needed for API navigation and model management. Through case studies and analysis, we demonstrate that the conversational engagement with system models facilitated by LLMs can lead to a democratized and accelerated design process. However, this advent is tempered by a critical awareness of potential pitfalls, such as automation bias and overreliance on automated systems—underscoring the need for continued human oversight and the examination of ethical considerations.

Emphasizing the chance of SysML v2 being inherently English-based and the parallel maturation of LLMs, this paper suggests that the collaborative utilization of these concurrent advancements may offer an opportune fusion, potentially revolutionizing the way systems are modeled and managed. Future work involves the empirical validation of these approaches and a deeper investigation into interoperability with existing and future systems engineering ecosystems. The ultimate goal is to ensure that this fusion not only complements human expertise but also propels systems engineering into a new era of innovation and holistic design.

Keywords. API, , Assistant, Large Language Model, LLM, SysMLv2

Introduction

# Introduction

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| results and conclusions |
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| and reason for the study |
| Text Body | Methodology, analysis, |
| or other value added process |
| Conclusions | Summary in layman's terms |
| of the result of this study |
| Recommendations | Specific steps to follow |
| as a result of this study |
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