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***Abstract*—This document is a model and instructions for LaTeX. This and the IEEEtran.cls file define the components of your paper [title, text, heads, etc.]. *CRITICAL: Do Not Use Symbols, Special Characters, Footnotes, or Math in Paper Title or Abstract.**

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I. Introduction

Model-Based Systems Engineering (MBSE) has become a cornerstone methodology for managing the complexity of modern Cyber-Physical Systems (CPS). The development of CPSs is inherently challenging because they combine software with hardware embedded in the physical world. MBSE has become the industry standard for the development and design management of these complex systems, extending the classical systems engineering by utilizing a centralized system model.

By emphasizing the use of **formal models** throughout the system lifecycle, MBSE supports the design, analysis, and verification of system representations, promoting consistency, traceability, and reusability across engineering processes. MBSE enables system architects to respond more quickly and effectively to numerous changes in requirements that occur during the development process.

In this context, the Models are crucial for specifying the high-level, architecture, functionality, uses cases, requirements, and constraints of the technical systems.

+ Problem statement (Introduction to SysML v1 and V2)

+ Research question + Highlight the focus which is on specific scenarios not a holistic overview of the tools + Thesis statement

II. Theoretical Background

A. MBSE

B. SysML v1 Foundations

C. SysML v2 Foundations

III. Results

A. SysML v1

IV. Discussion and Implications

V. Conclusion and Outlook

Identify applicable funding agency here. If none, delete this.

ACKNOWLEDGMENT

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