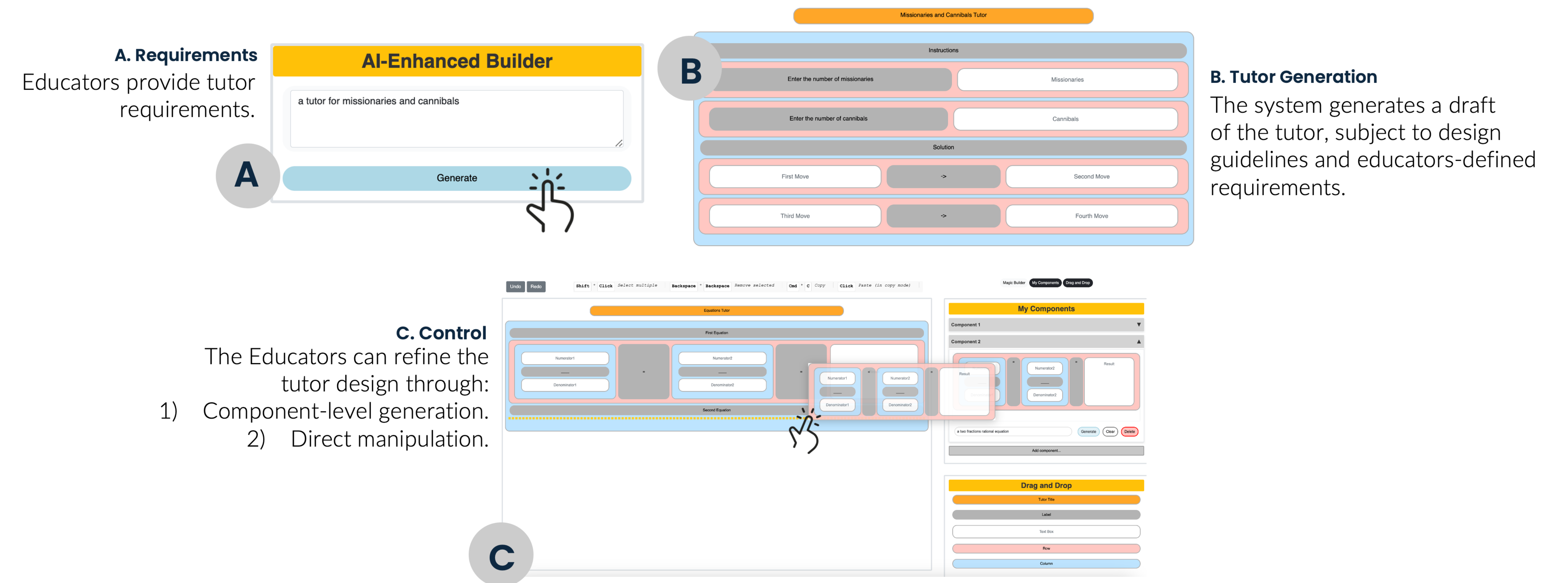


Introduction

- Intelligent Tutoring Systems (ITSs) provide personalized education but their widespread adoption is limited by the specialized skills needed to develop them.
- No-code authoring tools like the Apprentice Tutor Builder (ATB) enable educators to build ITSs, but assume they have the necessary skills to design effective tutor interfaces.
- We propose enhancing ATB with generative AI capabilities to assist educators in creating interfaces based on their requirements, while still allowing for educator customization.



AI-Enhanced Tutor Interface Builder

- The AI-Enhanced Tutor Interface Builder leverages a generative AI approach to assist educators in creating effective and engaging tutor interfaces based on high-level requirements they provide.
- The system supports two levels of generation: **interface generation**, which creates a complete tutor interface layout as a starting point, and **component generation**, which allows educators to create specific reusable components that can be integrated into the final interface.
- To guide the generation process, we employ prompt engineering techniques and a Domain Specific Language (DSL) that enables efficient communication between the educator's requirements and the underlying Large Language Model (LLM).

Evaluation and Results

- We conducted a small-scale preliminary evaluation to compare the efficiency of the AI-enhanced Apprentice Tutor Interface Builder against the version without AI assistance.
- The evaluation involved four team members designing two tutor interfaces (a simple and a complex one) and recording the time and keystrokes required, which were then compared to the performance of high-expertise individuals using the non-AI version of the tool.
- The results showed efficiency gains when using the AI-enhanced tool, with a **23% reduction in time** for the simple interface and a **68% reduction for the complex interface**, suggesting that the AI assistance is particularly beneficial for designing more advanced tutor interfaces.

Acknowledgement

This project is supported by National Science Foundation under Grant No. 2247790 and Grant No. 2112532. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Interface Type	Time (s)			Keystrokes		
	Classical	AI-Enhanced	Reduction	Classical	AI-Enhanced	Reduction
Simple	187	143	-23%	184	126	-31%
Complex	372	116	-68%	141	74	-47%

Table 1: Comparison of time and keystrokes required for building tutor interfaces: Classical vs. AI-Enhanced