Human and AI Understandable Interactive Design Grammars

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Research Area「NextAI-Math-Info」
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Outline

The game industry and other creative fields are being limited due to the growing complexity of projects and shortage of personnel. Generative AI seems poised to help, but is plagued by low explainability, difficulty to control, and limitations in extrapolating to new ideas outside of the training data. This research aims to overcome the fundamental problems of existing generative AI approaches by leveraging expressive and flexible grammars that are understandable to both humans creators and AI, in order to boost creativity and productivity while keeping the human creator in full control of the final product.

Research Goals

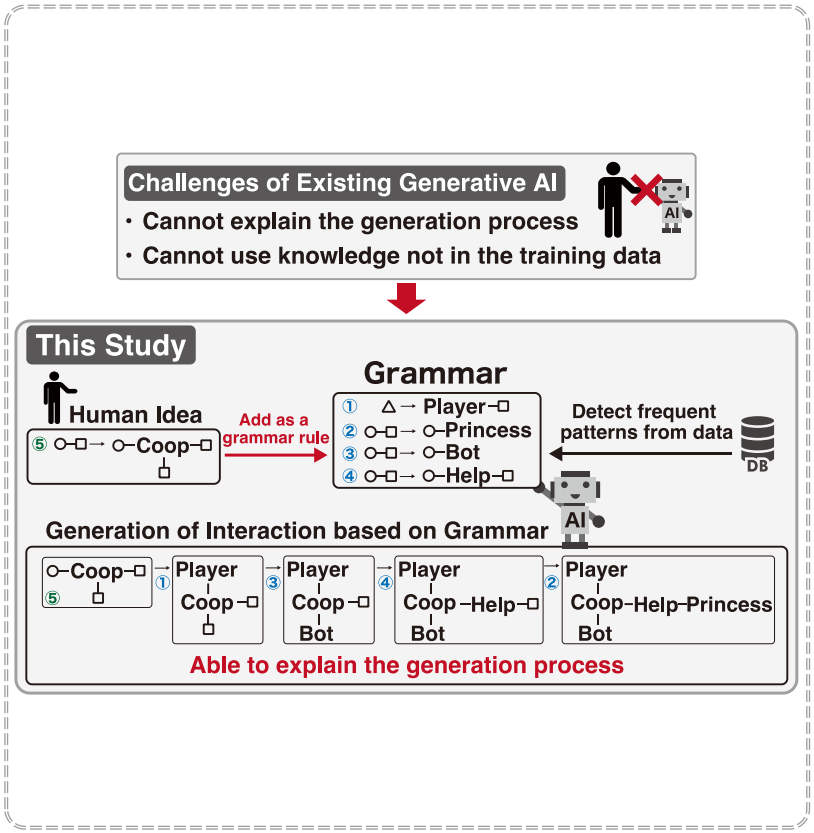
Develop grammar-based AI technology in the game design domain as a proof of concept.

Originality and Novelty

- Existing generative AIs cannot explain their generation process. In this research, we propose extracting grammar that both humans and AI can interpret, and by employing these grammars, we enable interpretable and and modifiable complex design paradigms.
- Existing generative AIs have difficulties using human ideas that are not included in the training data. In this study, by adding human ideas as grammar rules, we enable the AI to utilize human ideas that are not in the training data.

Challenges

Low data paradigm in combination with a necessity to design the grammars to be both amenable for machine learning techniques and human interaction while not suppressing human creativity.



Future Deployment & Research Plan

- (Vision) We aim to establish a collaborative creative process where humans and AI work together using a shared set of concepts and language. Instead of leaving everything to AI based on a single prompt or relying solely on manual efforts, we hope to blend these approaches gradually for a more integrated creation.
- As a practical implementation of this vision, we will focus on applications within the game design development area and then expand into other areas of productive creative activities. Specifically, our goal is to dramatically reduce the labor involved in prototyping games, aspiring to create a world where anyone can easily craft new games.
- The study during the ACT-X period is positioned to develop the fundamental technologies necessary to realize these aspirations.