CHI 2025

Understanding the Potentials and Limitations of Prompt-based Music Generative AI

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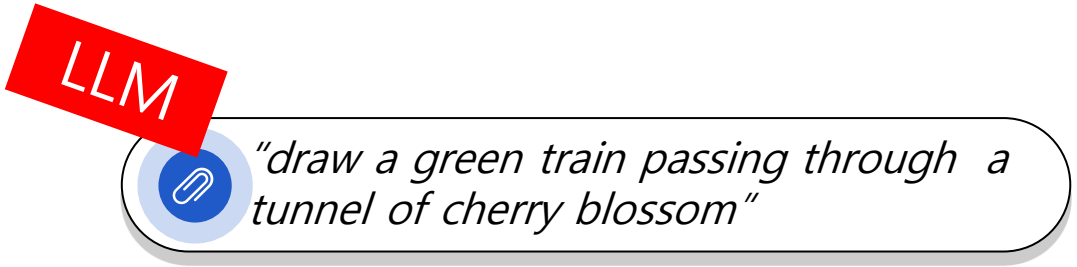
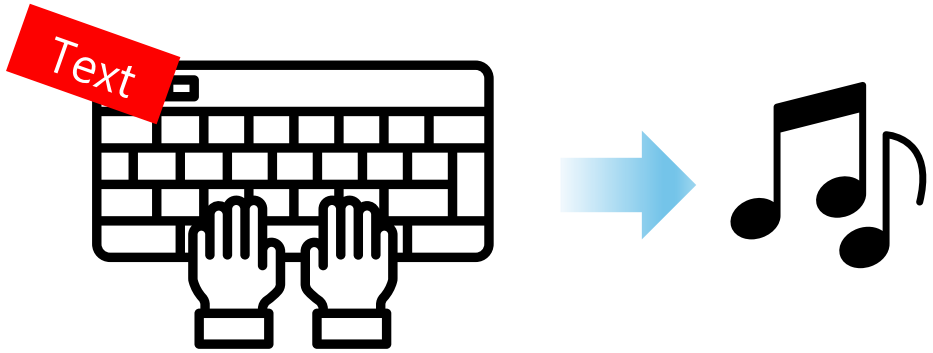
Change in creative methods

Drawing

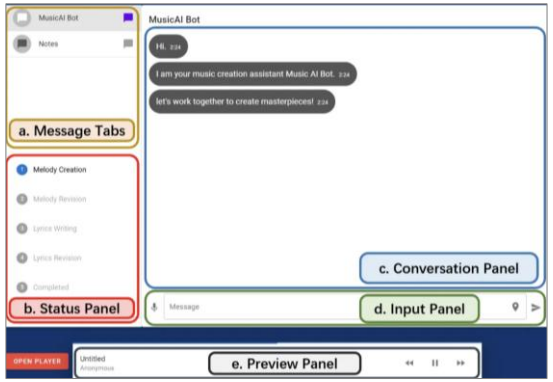


Typing

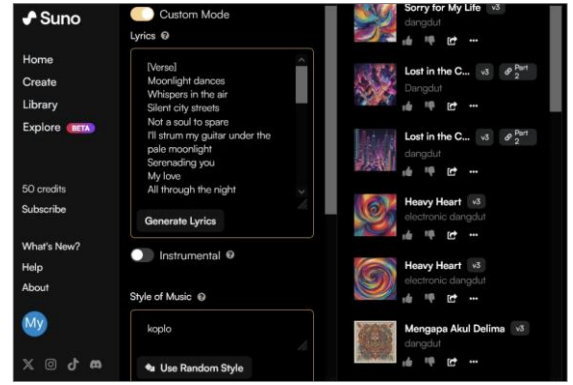
Prompt-based Music Generative AI



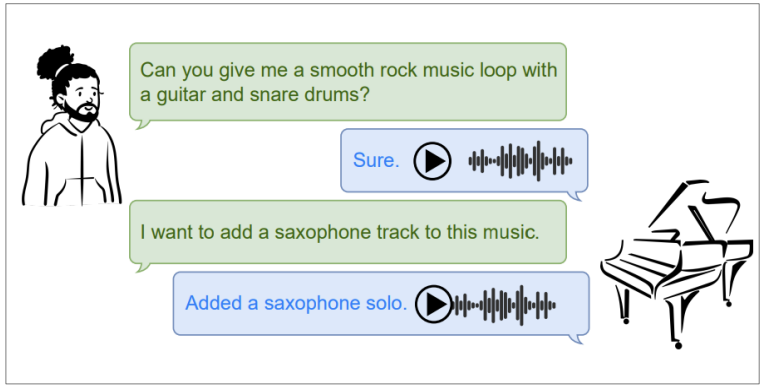
COSMIC (2021)



SUNO



Loop Copilot (2024)



User's musical intent discrepancy

Intended music

Generated music

"create slow and calm piano music suitable for studying "

≠

- Temporal Nature
- Linguistic Ambiguity
- Specialized Expertise

Participants

3 Expertise group

To explore how creators' demand for music GenAI vary with individual characteristic

Expert  Novice  Nonprofessional 

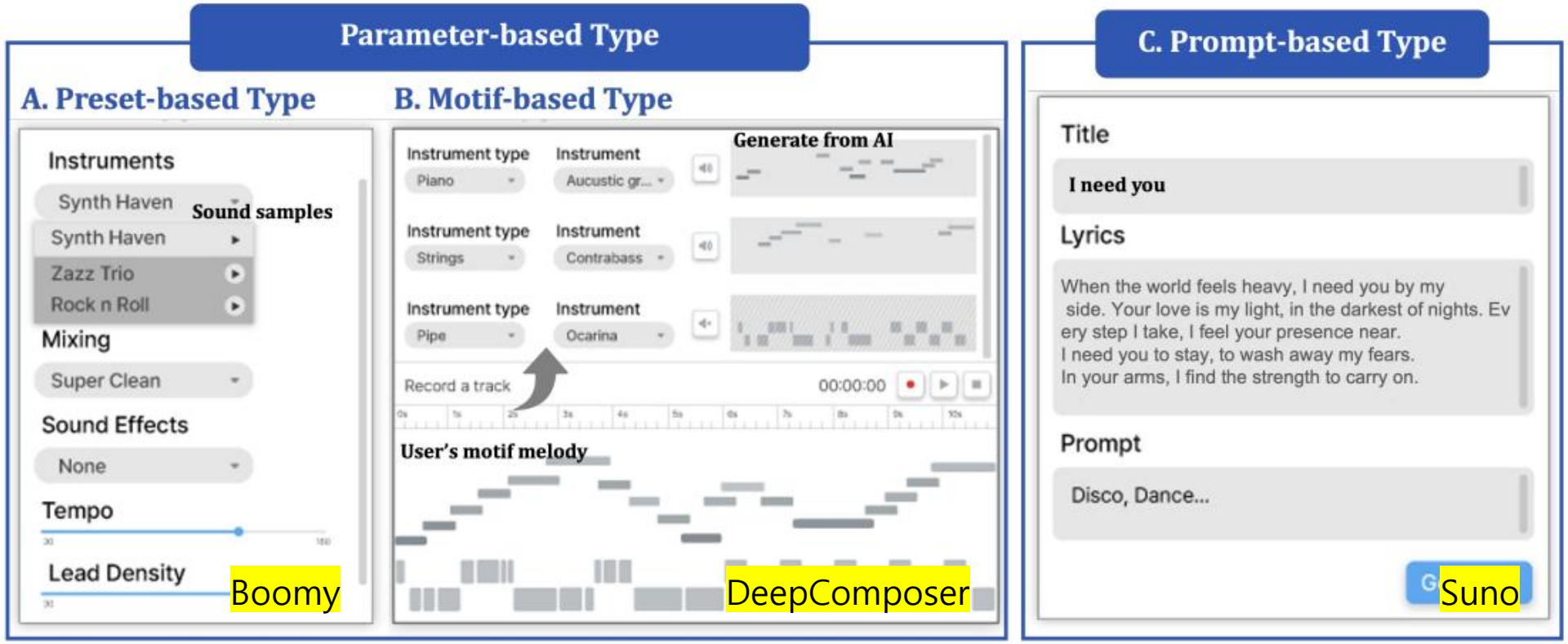
Group	Participant ID	Gender	Age	Job	Composition Genre	Composition Experience	Knowledge of Music GenAI
Expert	E1	Male	24	Composer	K-pop (ballad)	10 years	One-time experience
	E2	Female	30	Composer	Classic	10 years	One-time experience
	E3	Female	34	Composer	K-pop (dance)	10 years	Only heard
	E4	Male	31	Composer	Electronic	11 years	One-time experience
	E5	Female	31	Composer	Classic	13 years	One-time experience
	E6	Female	33	Composer	R&B	11 years	Only heard
Novice	N1	Male	20	Student (guitarist)	Drama	1 year	No Knowledge
	N2	Male	20	Student (guitarist)	Rock	1 year	Only heard
	N3	Female	28	Singer-song writer	K-pop (ballad)	2 years	One-time experience
	N4	Male	20	Student (drummer)	K-pop (ballad)	1 year	Only heard
	N5	Male	22	Student (rapper)	Hip-hop	1 year	Only heard
	N6	Male	24	Music performer (rapper)	Hip-hop	3 years	Only heard
Nonprofessional	NP1	Female	30	Web designer	Christian music	None	One-time experience
	NP2	Female	30	Fiction writer	K-pop (ballad)	None	No knowledge
	NP3	Male	32	Software engineer	Rock	None	No knowledge
	NP4	Male	27	Master's student	K-pop (dance)	None	Only heard
	NP5	Female	26	Master's student	K-pop (dance)	None	One-time experience

Melody-focused gernes Beat-focused gernes

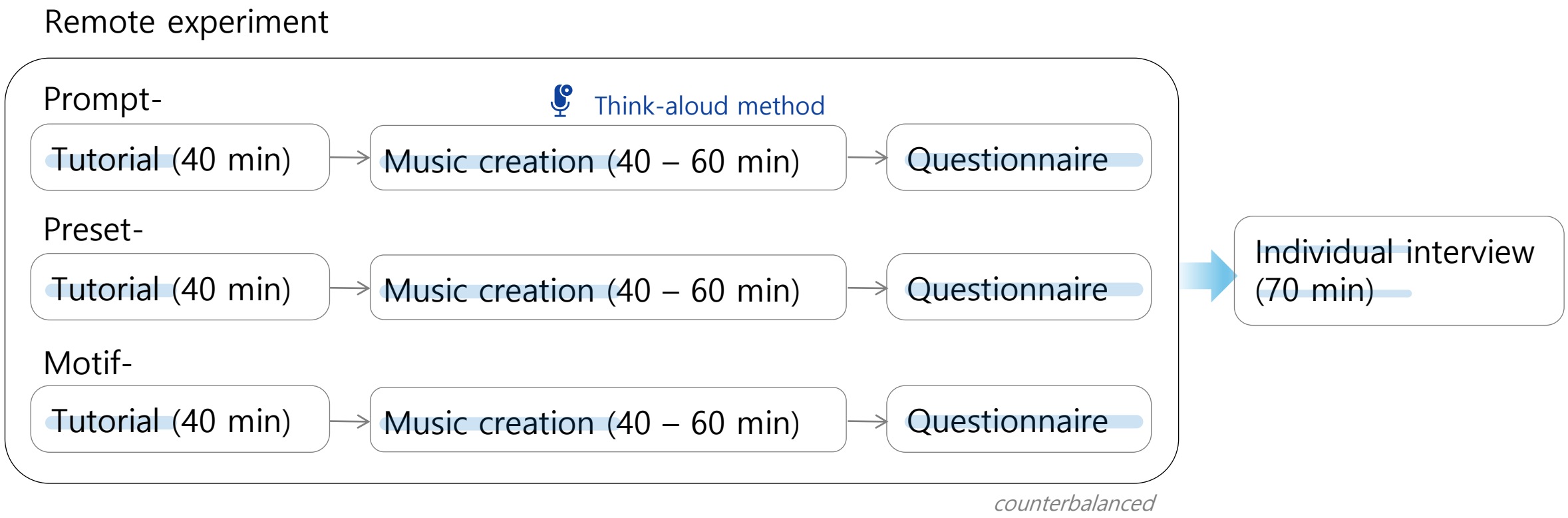
Types of music GenAI

3 commercial AI tools

To explore how creators' demand for music GenAI vary with individual characteristic



Process


Remote experiment
Prompt-
Think-aloud method
Tutorial (40 min)
Music creation (40 – 60 min)
Questionnaire
Preset-
Tutorial (40 min)
Music creation (40 – 60 min)
Questionnaire
Motif-
Tutorial (40 min)
Music creation (40 – 60 min)
Questionnaire
Individual interview (70 min)
counterbalanced

Measures

1. Questionnaire (13 items), 7-point Likert scale
   - **The composition experience**
   - **The attitude toward AI**

2. Post-interview, open-ended questions

   (1) Overall compositional objectives and methods

   (2) Compositional strategies, potentials, and challenges specific to music GenAI

   (3) Design of music GenAI in relation to the Co-Creative Framework for Interaction Design

Analysis

✔ Quantitative analysis

Descriptive analysis to provide insights into the trends and patterns observed across these groups

✔ Qualitative analysis

Thematic analysis approach focused on strategies, potentials, and challenges with AI according to interaction type and expertise group

Finding 1

Compositional goals and AI strategies across expertise levels

Expert group

- ✔ Music GenAI enhances flexibility and efficiency in music creation.

Novice group

- ✔ Music GenAI supporting reference-based creation.

Non-professional group

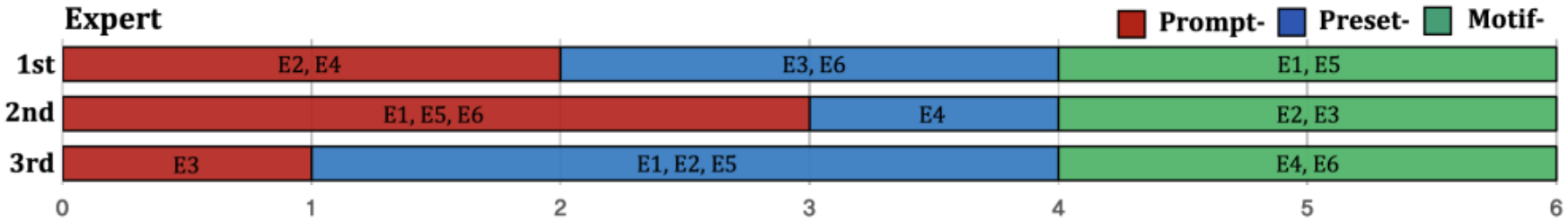
- ✔ Music GenAI transforming textual concepts into music.

Finding 1

Interaction type preferences across groups (1/3)

Expert

Genre-specific preferences



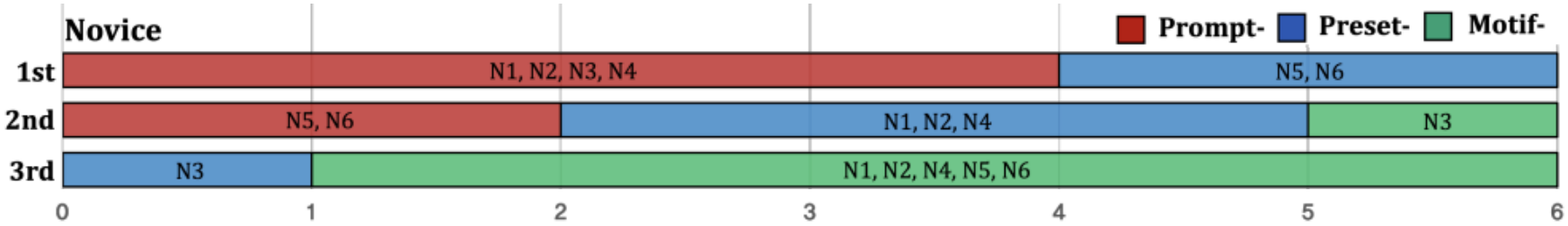
- R&B/hip-hop and K-pop (dance) composers preferred the preset type
- Classical and K-pop (ballad) composers favored the motif type
- The prompt type was favored for genre exploration – useful for exploring various musical styles

Finding 1

Interaction type preferences across groups (2/3)

Novice

Reference-based approach



- Most novice participants (N=4) favored the prompt type, which aligned well with their working style (reference-based approach).

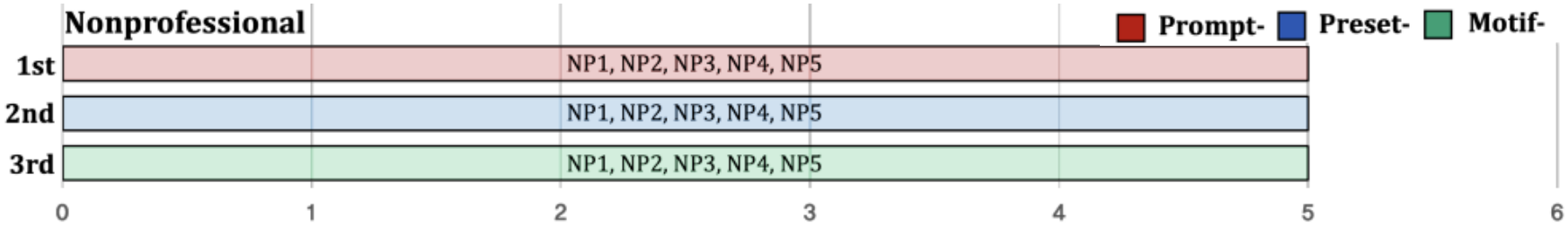
- The preset type was also allowed for music sample configuration.

- The motif type was the least preferred because it required converting motif samples into MIDI melodies for AI processing – challenging to express reference melodies solely through musical notation.

Finding 1

Interaction type preferences across groups (3/3)

NonProf Intuitive language-based interaction



- As the ability of AI to convert abstract musical ideas into actual compositions was crucial for novices, they preferred prompt type.

- As they found it challenging to professionally evaluate and modify AI-generated composition, the motif type was the least preferred, as it required creating melodies from scratch.

Finding 2

Creative opportunities vs. challenges in conveying musical intent

- ✔ Experimentation possibilities for entire compositions

  Hybrid gernes (e.g., "dance and blues")

- ✔ Exploration of unexpected musical outcomes

  Translated visual and tactile concepts into music (e.g., "red dance pop")

- ✔ Integration with one's own field

  Create background music for storytelling
  (e.g., "a tender love story between a man and a woman on a snowy day")

Finding 2

Creative opportunities vs. challenges in conveying musical intent

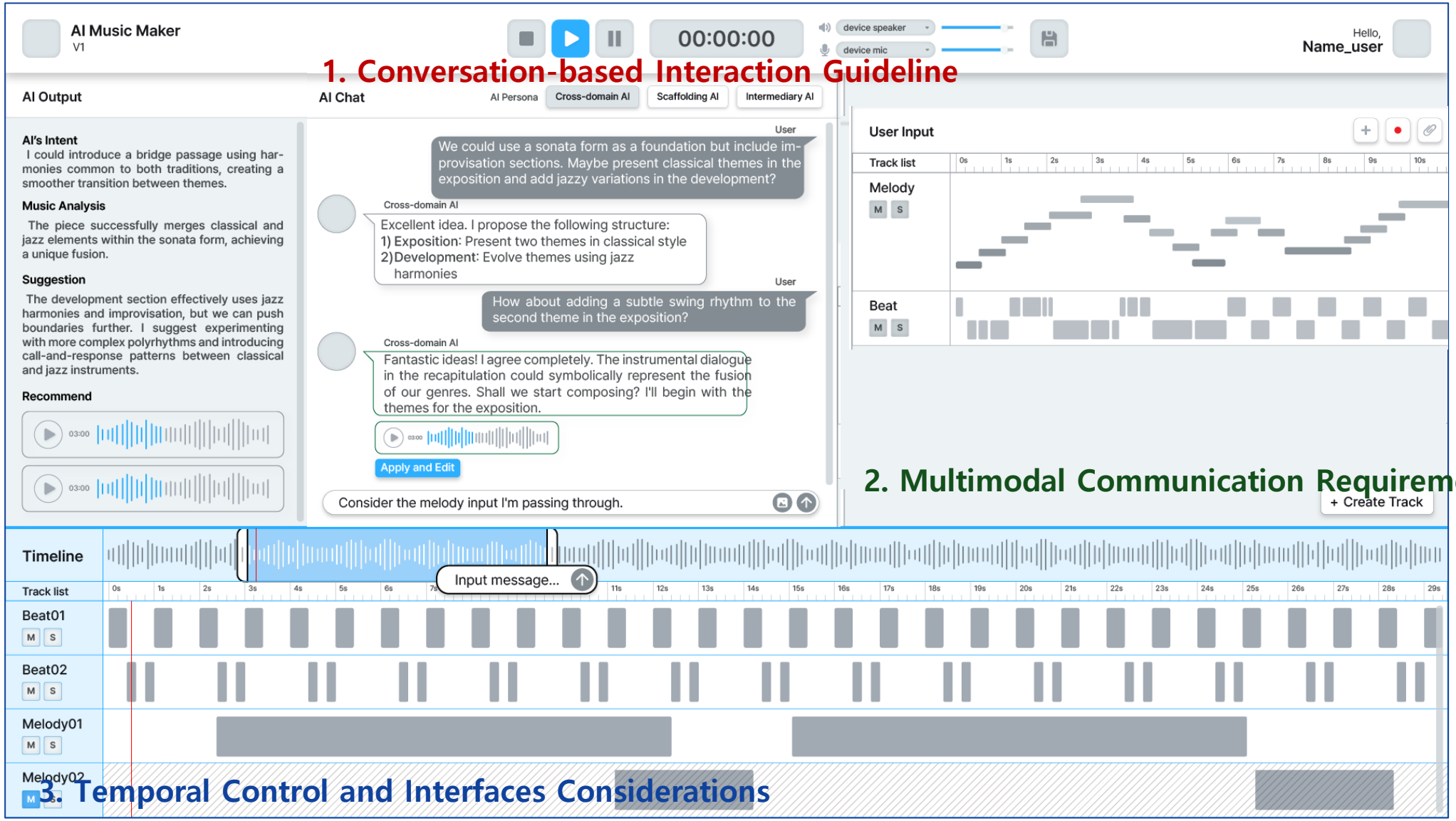
- ✔ Ambiguous descriptors

  e.g., "fast", "slow", "accelerando"

- ✔ Difficult to verbalize ideas during the modification process

  " That's not what I want, but it's hard to explain exactly how to change it"

Discussion and Design Implication



Limitation and Future Work

Limitations

- Limited sample size per expertise group
- Specific restrictions per tool

Future work

- Need for more diverse and larger sample
- Creating unified system all three interaction type

Conclusion

1. The study compared three AI interaction types to understand prompt-based systems' strengths and weaknesses

2. The research provides insights for designing prompt-based music GenAI that considers music creation's complexity

3. By offering practical design guidelines for various interaction types, the study contributes to improving music GenAI's usability and effectiveness

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Thank you for listening

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