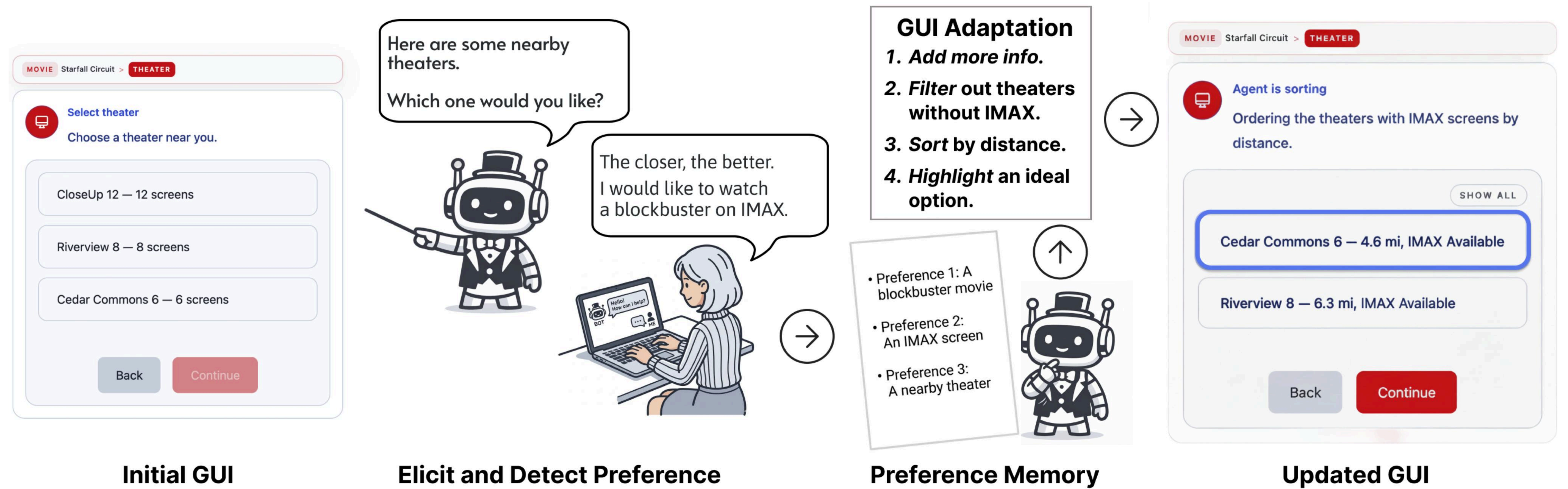


# TUNING: Adaptive GUI Modification as Agent Tools in Task-Oriented Chatbots

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Human-AI-UI Interactions  
Across Modalities



## Problem

- Task-oriented chatbots embed **GUI components** (buttons, calendars) alongside conversation
- Users express preferences in natural language that go beyond what the GUI affords
- **Full automation** agents act on behalf of users, removing them from decisions
- **Generative UI** replaces the original interface, breaking familiar context

## Adapt Before Automate

- Agent **modifies existing GUIs** instead of acting for the user or generating new UIs
- **Clear intent**  
→ perform GUI interaction (select, navigate)
- **Ambiguous/subjective intent**  
→ adapt the GUI to support decision-making
- All adaptations are **in-place** and paired with natural language explanation

## Preference Memory

- Extracts preferences from natural language as structured records
  - **Strength:**  
*hard* (“must,” “only”) vs. *soft* (“prefer,” “ideally”)
  - **Relevant stages:** which workflow steps the preference applies to
- Strength determines which operator to apply:
  - Hard → **Filter**
  - Soft (ordinal) → **Sort**
  - Soft (categorical) → **Highlight**

## Preliminary Findings

Within-subjects study (N=33), movie-ticketing chatbot

- **Fewer requirement violations** in final selections with adaptive GUI ( $p=.047$ )
- **Fewer unpreferred selections** during decision-making — users made better-informed choices ( $p=.008$ )
- Users **ranked adaptive agent higher** than baseline across conditions ( $p<.001$ , Friedman test)

## Four GUI Adaptation Operators

- **Augment** — Surface hidden metadata (e.g., ratings, runtime) onto GUI elements
- **Filter** — Hide options violating hard preferences; reversible via “Show All”
- **Sort** — Reorder by preference-relevant attribute (e.g., shortest runtime first)
- **Highlight** — Emphasize best-matching options with visual border

