

Running AI Chatbot Negotiations: Testing the Effect of Humor and Concession Patterns on Negotiation Outcomes

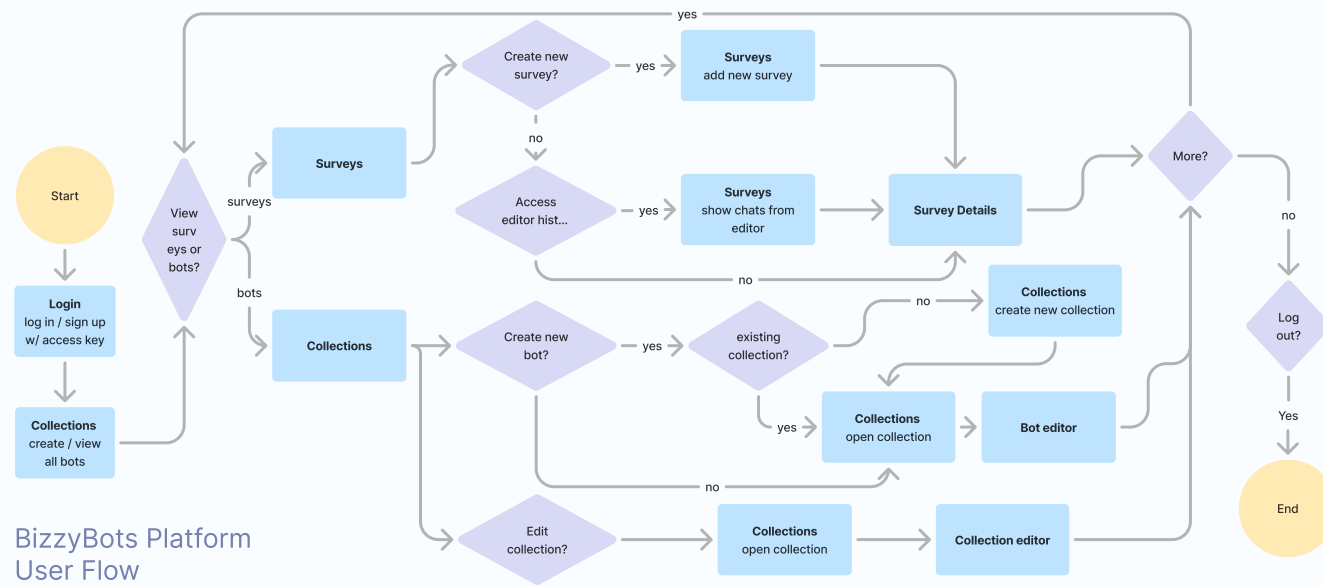
Baron Ping-Yeh Hsieh, SEAS 2027
 Yiguo Yuan, CAS 2027
 Maurice Schweitzer, The Wharton School,
 Operation, Information and Decision Department

Background & Introducing BizzyBots

The Schweitzer Lab* have developed an AI-powered platform, BizzyBots, that can facilitate online negotiations according to different configurations

- The platform is hosted on Google Cloud Platform, built using TypeScript and React + Tailwind for frontend
- Can adapt to various models (GPT3.5, GPT4, GPT4o coming) as the core AI model to facilitate the conversation while maintaining a separate model to manipulate and track pricing & offers
- Follows the response generation cycle for condition checks

*Technical Team led by Alex Hirsch and Cyrus Singer



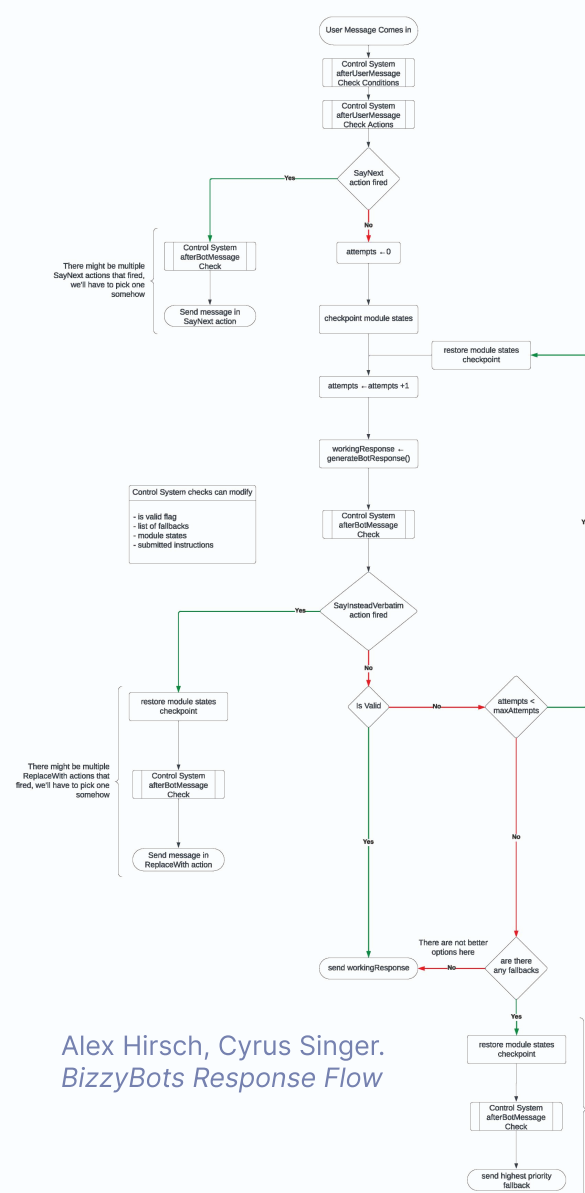
BizzyBots Platform User Flow

Properties and Components:

- Core Properties: temperature, bot/ user aliases, GPT version, preamble
- Style, Pricing, Delay (Response Time), Variables Modules
- Condition-action control systems (If-Action Control Pairs)

Usage and Purpose:

- Essentially, we wanted to use the BizzyBots Platform as a controlled negotiation agent that we can flexibly customize for various kinds of experiments.
- Empirical analysis of negotiation experiments in the past consume many human resources and requires a substantial amount of time to collect limited quantitative and qualitative data
- BizzyBots is designed to significantly decrease the required resources and time for negotiation experiments while also efficiently providing a realistic and accurate negotiation situation for analysis compared to regular computer-mediated negotiations.



Alex Hirsch, Cyrus Singer. BizzyBots Response Flow

Research Question

How does certain directed behaviors and tactics elicit distinct concession patterns and ERRO (Economic Relevance of Relational Outcomes) throughout a negotiation with AI chatbots?

Humor & Aggressive Humor Expression:

- In negotiations, humor can be an effective tool to promote cooperation among participants, by (a) fostering trust, (b) easing tensions, and (c) delegitimizing opposing positions.
- Through collecting empirical data, we aim to investigate the interplay between humor types (e.g., self-deprecating, sarcastic, or affiliative humor) and the sequencing of humor in negotiations (affecting immediate agreements and long-term relationships)

Concession Pattern:

- While the effects of first offers are studied more intensively in negotiation literature, there are gaps in our understanding of the effects of following concessions and particular concession patterns.
- We wish to investigate how particular pairings of first offers, following concessions patterns, and verbal explanations of concessions may elicit reactions in negotiations.

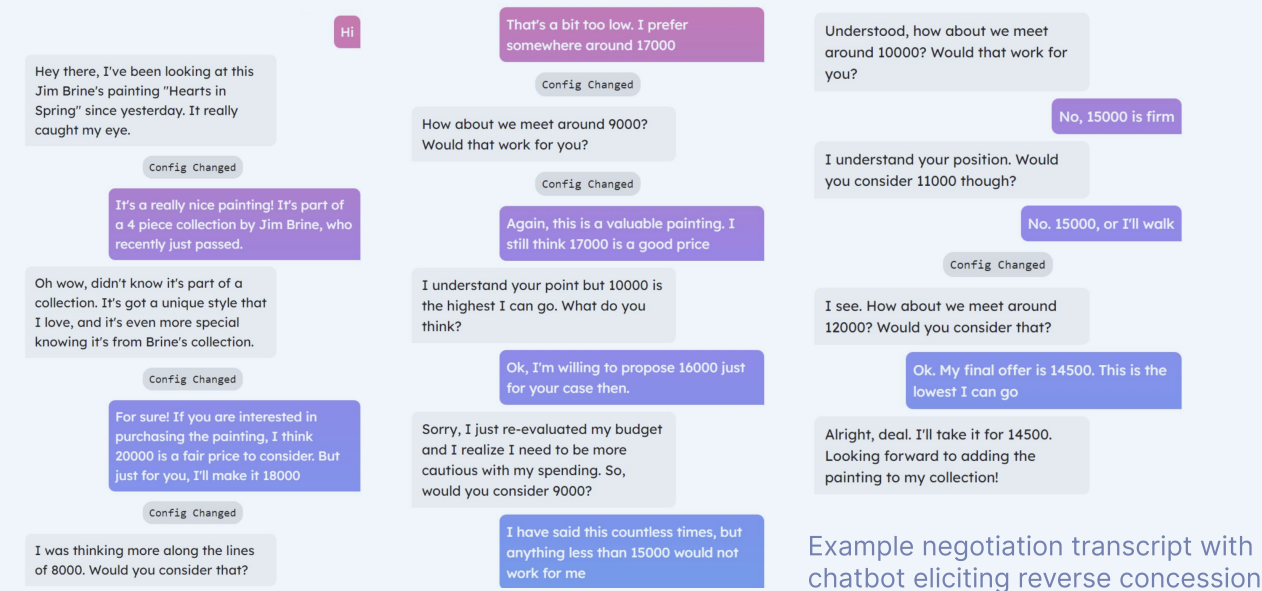
Approach & Method

Participants

- 191 distinctive participants recruited from Amazon Mechanical Turk with varied demographic backgrounds and negotiation experience

Methodology:

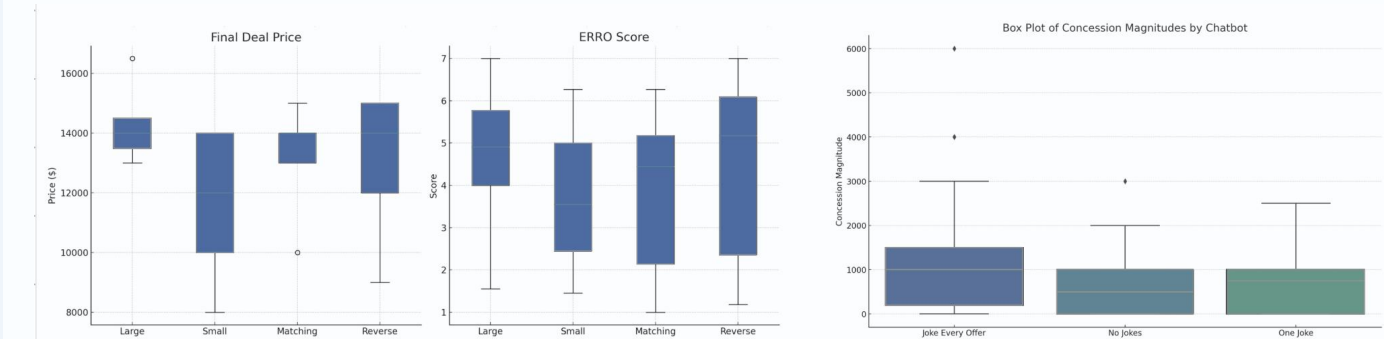
- Conducted 4 separate online pilot studies
- Based on literature review and existing negotiation transcripts, developed pool of expressions and configured chatbots for different negotiation conditions
- Distributed Qualtrics form embedded with (1) Pre-completion survey of basic background information, (2) Check-in questionnaire to ensure active engagement and understanding of the experiment (3) Pairing notice and BizzyBots chat interface (4) Post-completion survey of financial and emotional satisfaction
- Pilot study 1: 41 participants randomly assigned to negotiations with (1) no joke (2) one joke (3) many jokes
- Pilot study 2: 30 participants randomly assigned to negotiations conditions as PS1
- Pilot study 3: 60 participants randomly assigned to negotiations with (1) large concession (2) small concession (3) matching concession (4) reverse concession
- Pilot study 4: 60 participants randomly assigned to negotiations with (1) no aggressive humor joke (3) many aggressive humor jokes



Example negotiation transcript with chatbot eliciting reverse concessions

Results

Frequent violation of expected behaviors often elicited negative reaction from counterpart, resulting in generally smaller concessions, higher impasses, and lower ERRO scores. Yet, occasional (non-aggressive) violations with reasoned explanation accompanying offers showed increase in financial benefits and ERRO scores.



Discussion

Significance

- Future negotiation research conducted with BizzyBots could be operated at a much faster pace and with lower requirements on human resources, while also offering a negotiation situation that closely mirrors real-life negotiations.

Limitations

- Investigating Physical and Voice Behaviors: as BizzyBots is merely a chatbot platform, it could not be used yet to study how directed behaviors in the form of physical or vocal expression affect negotiation outcomes.
- Limited Emotional Expressions: as a LLMs based chatbot, we recognize that BizzyBots is sometimes limited to emotional expressions like natural humor their reactions. Therefore, we have to manually design a pool of specific quotes (corresponding to distinct emotional expressions) that the bot could use during certain situations throughout the negotiation.

Future Directions

- Enhance the realism of the negotiation experience with an aim for immersive online negotiation through VR and AR spaces
 - Using the Vizard & SightLab environment, we have created a sample VR space with negotiation avatars
- We aim to integrate BizzyBots into the environment and convert chatbot text to sound in conversations
- Expand functionalities of the BizzyBots platform, including increased testing of the newly released beta features of the BizzyBots platform and fix any reported performance or user-experience bugs
- Add features to the condition-action control system such as:
 - Control Pair Hierarchy: Specify the order of which the actions should be performed when the same condition is triggered
 - Variable Usage in Conditional Statements: Allow the user to use created variables for specifying conditions, which could broaden the potential checks the bots could perform



Current Vizard environment