1 Literature Review

The purpose of this literature review is to outline what has already been done in the area of bias in virtual characters and game AI. This review aims to inform our work by detailing how similar datasets have been created and used, what methods have been employed to analyze bias, and how our approach differs. Our project focuses on investigating two forms of bias: (1) linguistic bias in dialogue—specifically, gendered language and stereotypical descriptors; and (2) structural bias in character metadata—such as imbalances in gender distribution, role types, and physical/visual attributes.

2 Data Set Creation and Usage

2.1 SimsChat Dataset

The SimsChat dataset was assembled from a simulated game environment inspired by *The Sims*. It comprises multi-turn dialogue and detailed persona descriptions designed to capture natural in-game conversations. This dataset has been used to analyze language patterns and assess how persona descriptions might reinforce stereotypical roles (**SimsChat Dataset**, GitHub).

2.2 CharacterDB Dataset

CharacterDB is a JSON Lines file that aggregates structured records from multiple online sources, including fan-maintained databases and official documentation. It contains detailed character metadata—such as multilingual names, gender, associated works, and visual/trait descriptors. Previous research has used similar datasets to perform quantitative analyses on character attributes, revealing over-representations and stereotypical trends (**CharacterDB Dataset**, Chen, 2020).

3 Methods Employed in Related Research

Prior research in this domain has employed a variety of methods:

3.1 Quantitative Analysis

Studies have used statistical techniques, including chi-square tests and frequency analyses, to measure the distribution of gender and role types in video games. Such methods reveal whether certain stereotypes, like the predominance of male protagonists, are statistically significant (**Williams et al.**).

3.2 Textual Analysis

Natural Language Processing (NLP) techniques—such as sentiment analysis, tokenization, and keyword extraction—have been applied to dialogue datasets to identify biased language patterns. Industry articles and technical blogs have highlighted the risk of AI models inheriting and amplifying these biases (**Masaar**; **Vakingbizz12**).

3.3 Cross-Modal Integration

More recent work has attempted to correlate findings from textual analyses with those from quantitative metadata studies, though few have integrated these modalities simultaneously. This represents a significant gap in the literature that our project seeks to address.

4 Project Goals, Methodology, and Evaluation

Our project's primary objective is to investigate how linguistic and structural biases manifest in virtual characters generated by game AI. To achieve this, we propose a dual-dataset approach that integrates:

4.1 Data Preprocessing

- **For the SimsChat dataset:** Clean and normalize dialogue data, and apply NLP methods (e.g., sentiment analysis, keyword extraction) to detect instances of gendered language and stereotypical descriptors.
- **For the CharacterDB dataset:** Use Python libraries (e.g., Pandas) to structure the metadata and conduct statistical analyses of character attributes.

4.2 Analytical Methods

- **Linguistic Analysis:** Quantify the prevalence of biased language in dialogue data using NLP techniques.
- **Statistical Analysis:** Conduct quantitative evaluations (e.g., chi-square tests) to assess whether the distribution of character attributes deviates significantly from balanced expectations.
- **Cross-Modal Integration:** Correlate findings from the textual analysis of SimsChat with the quantitative results from CharacterDB to examine whether language biases correspond with structural biases in character design.

4.3 Evaluation Strategy

- **Quantitative Metrics:** Statistical tests (e.g., chi-square) and bias indices will be used to evaluate the significance of observed patterns.
- **Qualitative Assessment:** A subset of dialogue samples and character descriptions will be manually reviewed to validate the automated analyses.
- **Cross-Validation:** Compare results from both data sources to confirm the consistency of bias manifestations across different modalities.

5 Gaps in the Literature and Project Differentiation

While previous research has examined either the visual aspects or the narrative content of virtual characters, very few studies have integrated both. Our work distinguishes itself by combining the dialogue-centric insights from SimsChat with the comprehensive metadata of CharacterDB, offering a more holistic view of bias in virtual character design. This integrated approach addresses

a critical gap in the literature and provides empirical evidence for the interaction between linguistic and structural biases in game AI.

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