# *Dream Car Finder (tentative)*

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***Abstract*—In this proposal we suggest and explore the development of an AI chatbot designed to assist consumers in searching for the vehicle that best suits their wants and needs. We propose the development of an AI chatbot that leverages natural language processing (NLP) and machine learning algorithms coupled with a comprehensive database of vehicles to engage users in a natural, conversational interface that can understand their preferences and provide personalized car recommendations. The goal is to simplify the car selection process and reduce the stress and burden placed on buyers. We explore related solutions and propose potential approaches to creating a user-centric and efficient automotive search process.**

## I. Introduction

In the modern automotive market, consumers face an overwhelming array of options to decide from. There are thousands of car models available, each with a myriad of features and specifications. In addition to traditional decisions such as those between manufacturers, models, price, and fuel efficiency, modern car buyers also face choices between fuel types, autonomous assistance features, and connectivity and infotainment. This complexity can lead to confusion, indecision, and choice paralysis, and can often result in dissatisfaction with purchase decisions. With advancements in artificial intelligence (AI) and natural language processing (NLP), there is an opportunity to enhance the car-buying experience by providing personalized assistance tailored to individual needs and preferences.

This paper proposes the development of an AI-assisted chatbot designed to guide users in finding a car that best suits their specific wants and needs. The central problem addressed by this research is the difficulty consumers encounter in navigating the vast array of vehicle options and making informed choices. Traditional methods of car shopping often involve time-consuming research and reliance of generic advice, which may not fully align with an individual's unique lifestyle, budget, and preferences. This chatbot aims to lighten the user's burden by simplifying the decision-making process by leveraging user inputs to deliver customized recommendations based on a comprehensive database of vehicles.

The significance of this problem extends beyond mere convenience; it aims to improve consumer satisfaction, economic efficiency, and reduce the rate of post-purchase dissatisfaction. By employing AI technologies, this proposal seeks to contribute to transforming the automotive sales process into a more user-centric and efficient experience.

## II. Related Works

As AI chatbots and database search engines are not novel ideas, we will discuss related works that we can draw inspiration from.

### *A. Akinator*

*Akinator* is a web game that employs machine-learning and a vast database of knowledge to deduce fictional and non-fictional characters and objects [1]. It is similar to the game *Twenty Questions*, in which players ask each other simple yes or no questions to deduce what the other player is thinking about. This process of using user input to narrow down possible results based on a database of knowledge serves as the basis for our proposed research. The problem with an *Akinator* style approach is that *Akinator's* database is built by users and adjusted by user input. This data provided by users can potentially be incorrect, so we propose the use of a carefully curated and comprehensive database to ensure accurate data for our chatbot to draw information from.

### *B. ChatGPT*

*ChatGPT* is a popular AI chatbot that uses NLP to generate human-like conversations and written content [2]. It leverages a generative pre-trained transformer (GPT), a type of large language model (LLM), that is fine-tuned for conversational applications. It produces human-like responses through a combination of supervised learning and reinforcement learning from human feedback. *ChatGPT* provides a user-friendly and conversational interface for users to interact with that we would like to adopt. However, although *ChatGPT* can be used to search for cars, it is not possible to verify the validity of the information it provides. *ChatGPT* is notorious for potentially providing inaccurate or false information, known as hallucinations [6]. For our

purposes, we would like to ensure that all information provided by our chatbot is accurate and citable.

### C. Traditional Search Methods

Traditional search methods for car buyers involve manual searches, the use of websites such as cars.com [4] to find available cars nearby, and a reliance on car dealership sales representatives to find information and narrow down choices. These options either place the burden of the search on the consumer or onto a sales representative that may not have the consumer's best interest as their priority.

## III. Proposed Approaches (Tentative)

We propose the development of an AI chatbot that will leverage NLP and a comprehensive vehicle database to provide users with a user-friendly solution to searching for a car that suits their needs and preferences. To achieve this, we propose an incremental approach to development. The first priority is the creation of a chatbot that uses simple yes and no answers to prompts to narrow down the search results from a database. Once this basic model of the chatbot is created, we can proceed to implementing more complex and user-friendly AI features similar to *ChatGPT*.

### A. Basic Model

To achieve a basic model of our chatbot, we propose the creation of a chatbot similar to *Akinator* [1]. To achieve this, we have found a tutorial on how to create such an application [3]. Using this tutorial as our basis, we can expand upon it and customize it to work with cars instead of characters. For our chatbot to have an accurate and comprehensive database of vehicles to search through, we propose the use of the CarAPI database [5], an automotive API created for developers that provides a free vehicle database.

This basic model of the chatbot will prompt the user with a series of simple questions, such as "What is your budget?" and "Would you prefer to drive gas, hybrid, or electric?". The chatbot will process the answers to these questions, search the database for cars that fit the given criteria, and provide the user with suggestions that meet the requirements they provided.

This model will implement the core features that we believe are integral to this project. It will provide a user-friendly text-based interface that will search a reliable and comprehensive database and provide users with customized suggestions. Using this model as our base, we will improve its user-friendliness by leveraging modern NLP to provide a human-like and conversational interface that can process more complex input.

### B. GPT Model

To achieve a human-like and conversational model of our chatbot that can process complex input, we propose the use of GPTs to create an interface similar to *ChatGPT*. This model will build off the basic model and improve upon how the user interacts with the chatbot. Through the use of GPTs, we hope to create a version of our chatbot that can process more complex user input. This will allow us to create a more conversational approach to searching for a car. For example, the user may be able to start a conversation with the chatbot by listing multiple criteria they want fulfilled, and the chatbot will process all the information and provide follow-up questions.

To accomplish this, we have investigated the use of several generative AI APIs. While OpenAI's custom GPTs look to be the most promising and well-known solution available, the custom GPT service is a premium service [10] and as such is not a feasible option for us. Instead, we

## IV. System Design (Tentative)

We propose a system

## V. References


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## VI. Appendices

### A. Appendix A - Task Assignments

1) *David Del Moral*
   - Paper writing
2) *Ricky Godsey*
   - Paper writing
3) *Ean Shi*
   - Paper writing
4) *Zachary Kao*
   - Paper writing
5) *Matthew Tomme*
   - Webpage setup

### B. Appendix B - Schedule

- Deadline 1: EOD September 29, 2024
  - Project Proposal
  - 3 pages
  - Project Webpage
- Deadline 2: EOD October 27, 2024
  - Project Checkpoint 1
  - 5 pages
  - Progress reports from each member
- Deadline 3: EOD November 24, 2024
  - Project Checkpoint 2
  - 7 pages
  - Progress reports from each member
- Deadline 4: EOD December 8, 2024

- Final Project Report
- 10 pages
- YouTube video
- Project presentation slides
- One-page project summary
- Project source code/data/readme
- Peer evaluations

- Deadline 5: Finals Week?
  - Project Presentation
  - 15-20 minute presentation including Q&A
  - 5 minute YouTube video demonstrating the application