SW Engineering CSC 648/848 Fall 2024

GAITORGATE

Section 02

Team 3

Team Lead: Jared Aung (yaung2@sfsu.edu)

Front End Lead: Ulices Gonzalez

Back End Lead: Andre Dargani

Github Master & Back End Engineer: Mowtee Sailan

Front/Back End Engineer: Marco Barraza

Back End Engineer: Sergio Aguilar

Department of Computer Science, San Francisco State University

Professor. Henry Villar

February 25th, 2025

History Table

Version	Date Submitted	Date Revised	Description
1.0	02/25/2025	03/07-11/2025	Initial Submission

1. Executive Summary

Users, whether they be students, professionals, all share a common problem when using search engines. Regardless of which option they patronize, users often are develeider results that lack relevance to their searches and give an overwhelming amount of data with little to no use. While a few widely used options are available worldwide, they can still fall short of what users truly need as they are not designed to solve nuanced queries which leads to them output generic and at times incomplete results. Most solutions also lack any form of accessibility when it comes to searches leading to users being stuck with text input which neglects the needs users have if they cannot provide text. Lastly users are often looking for a direct answer to their search but in many cases they also need to know how they can trust their results and without proper citations. Summaries, and analysis most results cannot be used.

GAITORGATE solves these issues and directly addresses them by prioritizing the needs of users above simplicity. Optimized to work with most modern browsers both mobile and desktop, **GAITORGATE** provides users an interactive experience that while minimalistic is modern and customizable. Users will have the ability to search using Text Prompts, Image Submissions, and even Audio Input for accessibility and usability in searching. Using input **GAITORGATE** will provide users results based on relevancy or other filters based on their preference. While also providing recommended search prompts based on past searches, **GAITORGATE** will allow users to compare results to refine their searches.

What sets **GAITORGATE** apart from the rest of the competition is the inclusion of Alli Gator, our AI chatbot. When in use Alli will generate summaries with real-time citations, and analyze data whether it be about stocks, directions, weather forecasts, or even other personalized options that will be gathered for users by Alli.

Team3 LLC's GAITORGATE is created to revolutionize how search engines are created and used. By addressing the many limitations created by current search engine options **GAITORGATE** provides a powerful resource to users worldwide that gives them the power to tailor their searches to their needs while breaking away from limited results. **Team3** is made up of students with diverse backgrounds in Computer Science ranging from front-end designers to back-end engineers, and database analysts. We have come together through our shared passion for revolutionizing users' search experiences and innovating what search engines can be. Together we are dedicated to bringing users **GAITORGATE,** and believe with continual support we can provide communities around the world with a memorable experience and platform that will change what it means to surf the web.

2. Personas and Main Use Cases

2.1. Cory: SFSU Student

Cory is a full-time student at SFSU and is majoring in Computer Science. Time management is a challenge for him because he is constantly juggling classwork, a job, hobbies, etc. He is very passionate about technology so he frequently searches for resources that will aid him in staying ahead within his field. However, despite his proficiency in using online tools, he often struggles with cluttered and irrelevant search results.

Goals and Pain Points:

- Needs a fast and accurate search engine for academic research
- Wants to find credible sources without surfing through irrelevant results
- Prefers AI-driven suggestions for better learning outcomes
- Feels overwhelmed by the multiple tabs and search engines that don't prioritize academic reliable sources

Tech Comfort:

- Technically proficient with online software but prefers little friction when navigating technology.
- Comfortable with AI-driven suggestions and prefers interfaces that simplify workflow.

2.2. Hubie: Sports Enthusiast/Remote Professional

Hubie is a freelance sports journalist and fitness blogger who works from home. He travels often around the USA to cover sports events such as interviewing athletes and exploring new fitness trends. He relies on online tools for work, networking, and finding local gyms or sports facilities. He enjoys using search engines to look for new opportunities but doesn't find any luck due to the lack of customization that he's looking for. A crucial part of his work-life balance is both speed and accessibility on mobile and desktop/laptop.

Goals and Pain Points:

- Needs reliable location based search results for travel, accommodations, and sports events
- Wants a system that provides location-based recommendations for gyms and training centers
- Frustrated by search engines that don't provide customization for individual preferences
- Prefers a search assistant that can help refine results based on past interactions

Tech Comfort:

- Highly technically proficient and requires a search engine that is accommodating to his frequent travel needs.

- Prefer mobile-friendly solutions that are synchronized across devices for quick access.

2.3. Mary: Retail Business Owner

Mary owns a local retail business and manages online sales. She has basic technical skills but is not very experienced on the web. To help her growing business she is constantly looking up market trends/marking strategies and product suppliers, but falls short because her results end up being generic and unhelpful. Her top priority is efficiency and cost-effective solutions.

Goals and Pain Points:

- Needs an easy-to-use search engine that provides real-time useful analytics
- Wants to have geographically relevant search results that will aid in targeting local customers
- Struggles with generic search results that do not cater to business needs
- Seeks AI-assisted insights to help with decision-making

Tech Comfort:

- Low technical proficiency but happy to use easy-to-use, intuitive solutions.
- Prefers solutions that deliver clear, concise data and insights.

2.4. Main Case 1: Academic Research Assistance

An upcoming project is happening in a few weeks and a college student needs to research a topic. The student uses **GAITORGATE** to aid in finding credible sources for his project while filtering academic articles and giving access to AI-suggested material. Doing so will save time instead of wasting it on irrelevant searches/results. They will receive precise information that will help them complete their work efficiently.

2.5. Main Case 2: Sports Event and Fitness Search

A traveling sports journalist needs to find a gym and upcoming sports events to cover. Using **GAITORGATE**, they input their location and receive AI-powered recommendations for gyms, training centers, and sports venues nearby. The system tailors results based on past searches, ensuring they find relevant facilities quickly.

2.6. Main Case 3: Market Research for Small Businesses

A retail business owner wants to analyze market trends to improve their business. Using **GAITORGATE**, they search for their competitors' insights, customer behavior analytics, and local marketing strategies. The search engine provides

AI-driven reports and location-specific data which will enable informed business decisions.

2.7. Main Case 4: Finding Training and Sports Facilities

A freelance sports reporter is constantly on the move to report the most groundbreaking news. Due to always having to travel the reporter would like to keep up with his training routine. To help with that he logs into **GAITORGATE** and searches for "MMA training," "gyms near me," and "sports events upcoming." The AI search engine looks over the searches and past history to provide a list of some recommended training gyms nearby, available sparring partners, and event schedules. He bookmarks a few possibilities to think about later and selects a gym that fits his training needs.

2.8. Main Case 5: Finding Career Opportunities in the Gaming Industry

A recent college graduate who is very passionate about game development wants to jump right into the job market post-grad. She logs into **GAITORGATE** to look for some job openings and nearby networking events. She types in some keywords such as “game design jobs”, “gaming industry networking”, and “gaming events coming up”. The search engine filters the results based on industry trends, job postings, upcoming gaming career fairs, resume tips, etc. She bookmarks all the relevant listings and refines her search based on company reviews which eventually leads to her applying to a role that aligns with her skill set.

3. List of main data items and entities

3.1. Entity: **User** - Represents any individual who uses **GAITORGATE**.

a. Attributes:

i. User_id (primary key)
ii. Username (unique string)
iii. Email (unique string)
iv. passwordd_hash(securely stored credential)
v. Role (“regular”, admin)
vi. Data_created (DateTime of account creation
vii. Last_login (DateTime of last login)

3.2. Entity: **SearchQuery** - logs each user query(text, image, audio) that is processed

a. Attributes:

i. Query_id (primary key)
ii. User_id (foreign key Referencing User)
iii. query_text(user’s search input or text)
iv. Timestamp (DateTime the query was submitted)
v. Location_enabled (boolean including if the user allowed geographic filters)

3.3. Entity: **SearchResult** - Stores individual results retrieved or generated for a particular search query

a. Attributes:
   i. Results_id (primary key)
   ii. Query_id (foreign key referencing Search Query)
   iii. Title (string containing the results title)
   iv. Url (link to the source)
   v. Snippet (short preview or summary of the content)
   vi. Data_fetched(DateTime the results was retrieved)

3.4. Entity: **ChatMessage** - logs conversational exchanges between the user and our Ai chatbot

a. Attributes:
   i. Message_id (primary key)
   ii. User_id (foreign key referencing User, if it's a user message)
   iii. Sender_type (string: "user" or "bot")
   iv. Content (the message text)
   v. Timestamp (DateTime when the message was sent)

3.5. Entity: **ReviewRating** - Stores user reviews and rating for each search result

a. Attributes:
   i. Review_id (primary key)
   ii. User_id (foreign key referencing User_id)
   iii. Result_id (foreign key referencing SearchResult)
   iv. Rating_value (integer rating the user gives 1-5)
   v. Review_text (string text review or comment from the user)
   vi. Created_at (When the user submitted this review/rating)

4. Initial list of functional requirements

4.1. User Authentication

a. Users shall be able to register, log in, and manage their accounts.
b. User accounts shall be protected by multi-factor authentication (MFA) during login.
c. Users shall be able to update their profile settings and manage their search preferences.
d. Users shall be able to reset their passwords.

4.2. Search Engine Functionalities

4.2.1. Processing Queries

a. The search engine shall accept the following as relevant queries: text (keywords, natural language), images and audio.
b. The system shall retrieve related results from the database.
c. The system shall rank the results in order of relevancy as default.
d. The search engine shall recommend up to 5 related queries based on the user's last searches.
e. The system shall analyze and try to understand the intent of the searches and try to lead users to the correct resources.

4.2.2. Filters and Customization

a. The system shall allow the filtering of results by date, content type, relevancy, and recency.
b. The user shall be able to change the filters or apply multiple filters.

4.3. AI-Generated Summaries

a. The search engine shall generate concise summaries of the search results. The summary can be made longer and more detailed.
b. The system shall cite the source of information in the summaries.
c. The system shall be able to analyze real-time data (weather, stock market, location, and so on).

4.4. ChatBot (Alli)

a. The chatbot shall assist users by refining queries with keywords or suggesting a more relevant question to ask.
b. The chatbot shall be able to answer questions using the information from the search results.
c. The chatbot shall suggest additional material and resources related to the query.
d. The chatbot shall support multi-turn conversations.
e. The chatbot shall summarize the search results and the summary shall contain the links of the original articles or journals.
f. The chatbot shall be accessible by voice or text input.
g. The chatbot shall give recommendations and answers, using and citing the information in the search results and real-time data.

4.5. User Interface (UI) and User Experience (UX)

a. Users shall be able to switch between different UI themes (light mode, dark mode, etc)
b. The search results page shall highlight relevant keywords from the query.

4.6. Rate and Review System

a. The user shall be able to rate search results from 1 to 5.
b. Users can write reviews about search results.

c. The system shall prioritize higher-rated search results in search ranking.

4.7. Feature Comparison

a. Users shall be able to select multiple search results for comparison.
b. The system shall generate side-by-side comparisons for selected results.
c. The system shall highlight the key differences.

4.8. Security and Privacy

a. The system shall provide role-based access control for different types of users (admins, regular users)
b. Users shall be able to delete their search histories at any time.
c. Users shall be able to opt out of having their history stored.

5. List of non-functional requirements

5.1. The application shall be developed, tested, and deployed using tools and servers approved by Class CTO and as agreed in M0 (some may be provided in the class, some may be chosen by the student team but all tools and servers have to be approved by Class CTO).

5.2. The application shall be optimized for standard desktop/laptop browsers e.g., must render correctly on the two latest versions of two major browsers

5.3. Selected application functions must render well on mobile devices (this is a plus)

5.4. Data shall be stored in the team's chosen database technology on the team's deployment server.

5.5. The privacy of users shall be protected, and all privacy policies will be appropriately communicated to the users.

5.6. The language used shall be English.

5.7. The application shall be very easy to use and intuitive.

5.8. Google Maps and analytics shall be added.

5.9. No email clients shall be allowed. You shall use webmail.

5.10. Pay functionality, if any (e.g. paying for goods and services) shall not be implemented nor simulated in UI.

5.11. Site security: basic best practices shall be applied (as covered in the class)

5.12. Modern SE processes and practices shall be used as specified in the class, including collaborative and continuous SW development

5.13. The website shall prominently display the following exact text on all pages "SFSU Software Engineering Project CSC 648-848, Spring 2025. For Demonstration Only" at the top of the WWW page. (Important so as not to confuse this with a real application).

6. Competitive analysis

Feature	**theresanaiforthat.com**	**futurepedia.io**	**insidr.ai**	**GAITORGATE**
Search/Filtering	++	-	+	+
Recommendation	-	-	-	+
AI Chatbot	-	-	-	+
Rate/Review	+	+	-	+
Feature Comparison	-	-	-	+
Registered Developers	+	+	+	+

\+ Feature exists; ++ Superior: - Does not exist

6.1. Competitor Overview

a. **TheresAnAIForThat.com**
   i. TheresAnAIForThat.com provides a comprehensive AI tool directory with search and filtering functionalities. Users can find tools by typing keywords and searching by use case, features, and capabilities (e.g., tutoring, stock analysis). However, only registered users can search by pricing categories such as free, freemium, and free trial. While the platform allows users to set up a personalized "For You" page by selecting relevant tasks, it does not offer AI-driven recommendations. The website lacks an AI chatbot but

includes a rating and review system, making it easy for users to assess tools at a glance. Developers can submit their AI tools and promote them, but there is no detailed feature comparison, only a pros and cons list and an alternatives tab.

b. Futurepedia.io

i. Futurepedia.io organizes AI tools by category but does not support direct searching by use case or features. Users can refine their results using preset filters, such as features and pricing, within each category. Personalized recommendations are available only to registered users who receive AI tool suggestions via email every Thursday. The platform does not include an AI chatbot. Users can rate and review tools, and developers can submit their tools for a fee. However, it lacks a feature comparison tool, offering only a list of alternative tools for reference.

c. Insidr.ai

i. Insidr.ai allows users to search AI tools by use case and features. It also displays pricing, but users cannot filter tools by price. The platform does not provide AI-driven recommendations or a chatbot feature. Unlike the other platforms, Insidr.ai does not include a rating and review system. Developers are permitted to submit their AI tools, but there is no feature comparison tool available.

6.2. Competitive Advantage

GAITORGATE outperforms competitors by integrating AI-driven recommendations and an AI-powered chatbot that suggests the most suitable AI tools based on user preferences. Unlike existing competitors that lack intelligent recommendations or offer only basic search and filtering, **GAITORGATE** features a comprehensive search system that allows users to filter by use case, features, and pricing, ultimately enhancing the experience for users. Additionally, its chatbot provides personalized assistance, making it easier for users to discover the best AI tools without manually sifting through listings. **GAITORGATE** also enhances user engagement with a detailed rating and review system, including expert insights and AI-generated summaries. Furthermore, developers benefit from a more accessible and transparent submission process with promotional opportunities, unlike Futurepedia.io, which charges a fee. Lastly, **GAITORGATE** introduces a built-in feature comparison tool, allowing users to compare multiple AI tools side-by-side based on key attributes, functionality, and pricing. By combining advanced AI capabilities and intuitive search functionality, **GAITORGATE** ensures a more intelligent, seamless, and efficient AI tool discovery experience.

7. High level itemized architecture and technologies used

Architecture Pattern: Model-View-Controller (MVC)
Technologies:

- **Server Host:** AWS EC2 1vCPU 1GB RAM (t2.micro)
- **Operating System:** Linux (Ubuntu Server 24.04 LTS)
- **Front End:** HTML, CSS, Bootstrap
- **Web Framework:** Flask (Python)
- **Database:** MySQL

Tools: Visual Studio Code, MySQL Workbench, GitHub, Draw.IO

8. Team Roles

Team Lead: Jared Aung
Front End Lead: Ulices Gonzalez
Front End Team: Mowtee Sailan, Marco Barraza
Back End Lead: Andre Dargani
Back End Team: Sergio Aguilar, Marco Barraza
Database Lead: Jared Aung
Github Master: Mowtee Sailan

9. Checklist

a. Team found a time slot to meet outside of the class: **DONE**
b. Github master chosen: **DONE**
c. Team decided and agreed together on using the listed SW tools and development server: **DONE**
d. Team ready and able to use the chosen back and front end frameworks and those who need to learn are working on learning and practicing: **DONE**
e. Team lead ensured that all team members read the final M1 and agree/understand it before submission: **DONE**
f. Github organized as discussed in class (e.g. master branch, development branch, folder for milestone documents, etc.): **DONE**

References

Futurepedia. (n.d.). Find the best AI Tools & Software, Futurepedia.io. futurepedia. https://futurepedia.io/

Supercharge your business with ai. Insidr.ai - Everything about AI - Stay up to date with AI, the best AI tools, AI academy, AI guides and resources. (2024, October 29). https://insidr.ai/

There's an AI for that® - browse AI tools for any task. (n.d.). https://theresanaiforthat.com/