

CS4242 Social Media Computing

AY22/23 Semester 2

Project Report - Cafenaut, Group G5

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GitHub Repo link: <https://github.com/ooawagaeri/cafenaut>

1. Abstract

Given the ever-expanding food landscape of Singapore, identifying quality cafes of interest that have been popping up all over Singapore has become an increasingly challenging problem with the rise of more coffee establishments than ever, as well as malicious actors, threatening the sovereignty of blog sites and authenticity of reviews online. In this report, we will be reviewing the current problems and issues existing review platforms face in Singapore and how our proposed solution, Cafenaut, can potentially resolve these issues whilst providing new and compelling features that would enhance cafe-searching in Singapore.

2. Background

Cafes have sprouted up all over the local food scene of Singapore in recent years. Being a cosmopolitan city-state with many diverse communities, Singapore offers a thriving food scene that provides diverse culinary experiences for locals and visitors alike. Along with the many world-renowned restaurants and iconic hawker centres, a growing number of cafes and unique beverage establishments in Singapore have caught the attention of food enthusiasts today. According to a report by the Singapore Department of Statistics ([2023](#)), 938 cafes establishments were formed between 2019 to 2022 and cumulatively, with other coffee chains and houses, consumed a whopping total of 5,700,000 kg worth of coffee in 2022 alone ([Statista, 2022](#)).

Just as the Singapore cafe culture has evolved and expanded, so has the landscape of online food reviews. In recent years, there has been a surge in online food review platforms, with social media platforms such as Instagram and Facebook and websites such as TripAdvisor, Yelp, and local food blogs. Thus, this allows people to share their experiences at cafes and other food establishments. As a result, cafe-goers in Singapore have also turned to such platforms to seek recommendations for the best coffee establishments in the city or area.

Online reviews, establishment recommendations, and peer opinions play an increasingly important role in the decision-making process for customers. These tools not only assist consumers in discovering food establishments and making purchase decisions but benefit cafes too, which rely on rating systems to build trust and reputation for their potential customers. Thus, it has become vital for businesses to maintain their reputation and for consumers to trust these stores amid malicious actors. These include spam, false reviews, and fake accounts. It has become the responsibility of online platforms and blog sites to identify legitimate reviews and mitigate disinformation whilst providing a reliable and trustworthy source of food information, allowing casuals or connoisseurs to discover new locations and

give constructive feedback to businesses, and providing businesses insight into their customer characteristics and criticisms.

3. Objective

3.1. Target Users

In particular, the target users of our project are Singapore cafe-goers who rely on online food review platforms to decide whether they should try out a cafe spot or are looking to explore new options, either recommended by experienced cafe enthusiasts or conveniently located between cafe-goers.

3.2. Proposed Solution

Cafenaut, derived from the words cafe and naut (voyager), describes someone who loves discovering new and specialised cafes. The name of this application sums up the objective of this application which is to provide users with a reliable and trustworthy source of cafe reviews, allowing cafe-goers of similar tastes to interact with one another, discover hidden treasures, and express their insights into the Singapore coffee and tea landscape.

3.3. Use Cases

- As a user, I would like to create reviews easily so that I can share my opinions on a cafe.
- As a user, I would like to view a cafe review based on aspects so that I can easily analyse the review based on my needs.
- As a user, I would like to view my following / followers so that I can see how influential my reviews are.
- As a user, I would like to have review ratings tailored for me based on my drink preferences (Coffee / Tea Casual / Connoisseur).
- As a user, I would like to explore reviews that are written by users I have not followed to gain a broader perspective of reviews.
- As a user, I would like to explore reviews that are written by users I have followed to keep up-to-date.
- As a user, I would like to view all reviews written for a particular cafe so I can make an informed decision about visiting the cafe.
- As a user, I would like the option to report a suspicious review if it seems unauthentic.
- As a user, I would like to plan potential cafes to visit based on my friend's location so that we can go to an accessible cafe for both parties.
- As a user, I would like to view the authenticity of a particular location, where I can see how many reviews there are and how credible these reviews are so that I can easily decide which cafe to visit.

Based on the above requirements, users have vastly different needs and wants (drink preferences). This is why Cafenaut needs to have various sub-ratings for the elements in a cafe, so the user can see reviews that are the most relevant for them, and display a custom aggregated rating. Users will want to read reviews that belong to their demographic.

4. Problem Analysis & Review of Related Apps

In Singapore, the most prominent food reviews come in text and, sometimes, accompanied by images. However, finding these reviews or potential recommendations does not come easy

due to the large variety of social media platforms on which these text and audiovisual media can be posted.

4.1. Flaws of Existing Apps

This section will highlight the current downfalls of these platforms and sites.

Platform	Current flaws of the platform
Burpple	<ul style="list-style-type: none"> ❖ Lack of rating system. This increases the difficulty of evaluating a restaurant or cafe at first glance, requiring users to scroll through individual reviews to conclude themselves. ❖ Limit of one image per review. This restricts users from uploading more visual information about the cafe.
Google Reviews	<ul style="list-style-type: none"> ❖ Despite having a five-star rating, textual, and image-uploading system, Google Reviews allows rating-only reviews. Consequently, this increases the difficulty for users to determine whether the cafe fits their requirements. ❖ Lack of cafe specificity. Google Reviews lacks cafe, coffee, and tea-specific parameters in which cafe-goers may be interested. Thus, it is not suitable for cafe enthusiasts.
TripAdvisor & Yelp	<ul style="list-style-type: none"> ❖ Sponsored recommendations. Restaurants listed on the front page of these applications are legitimate recommendations but paid promotions. As a result, the authenticity of the establishments and applications would be lower as the listings do not meet user requirements. ❖ Paid and fraudulent reviews. Annually, platforms such as TripAdvisor and Yelp have a concerning number of paid fake reviewers. (TripAdvisor, 2019) (Yelp, 2021)
Food blogs	<ul style="list-style-type: none"> ❖ Sponsored reviews. Similar to TripAdvisor and Yelp, reviews posted on food blogs could be skewed as restaurants or cafes may pay bloggers to write biased information, affecting the authenticity of these sites.
Social Networks (Instagram & Facebook)	<ul style="list-style-type: none"> ❖ Sponsored reviews. Like food blogs, reviews posted by influencers could be unauthentic as cafes may pay them to publish biased reviews, affecting the authenticity of these sites. ❖ Lack of cafe specificity. They only offer text, image and video inputs, and the tedious task of scanning through paragraphs of text or image posts is required by users to find specific information about a cafe. ❖ Lack of map recommendation system. As mentioned in Section 2.2, Instagram and Facebook do not provide an easy way to find similar cafes.
Meet Halfway	<ul style="list-style-type: none"> ❖ Lack of review and cafe system. Despite providing a solution to finding halfway points between two locations, it does not offer reviews on the place. Thus, cafe-goers have to do a separate search on the cafes they find for reviews which is troublesome and time-consuming.

4.2. Summary of Flaws

In summary, we determined that today's cafe and restaurant review apps either lack a comprehensive rating system, limit one image per review, lack cafe-enthusiast-specific

criterias, do not support map recommendations, populate feeds with sponsored posts, or flood pages with fake reviews. As such, these flaws ultimately impede cafe-goers' evaluation and selection processes.

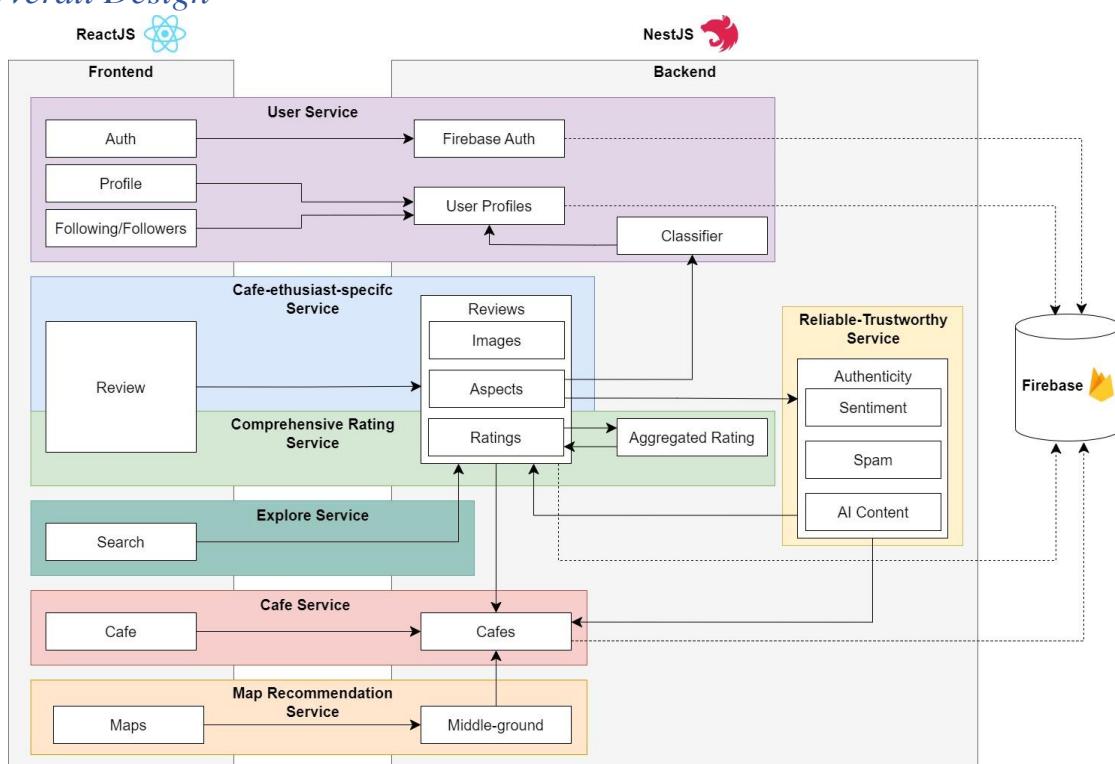
4.3. How Our Solution Tackles These Flaws

With these shortcomings in mind, Cafenaut aims to tackle these flaws by providing an all-in-one review platform, featuring:

- A comprehensive rating system (multiple aspect star-ratings) and cafe-enthusiast-specific criterias (multiple feedback fields for different cafe aspects) in which cafe-goers are more interested in. By capturing more information relevant to them, user reviews and impressions of cafes would become more detailed and relatable for other cafe-goers.
- Support for multiple images per review, which allows cafe-goers to upload multiple photos to express their viewpoints and menu items of the cafe. Capturing more visual data would enable searching-cafe-goers to visualise and make better-informed decisions.
- Map recommendations based on the location of cafe-goers by triangulating a middle-ground area with cafes and reviews. This enables convenient cafe searches that are accessible to all users quickly and effectively without dabbling with a separate application.
- No advertisement or sponsored post algorithm. By populating users' feeds with the latest posts by other users and varying star ratings based on their profile, this prevents advertisers or influencers from dominating the front page whilst allowing cafe-goers to find genuine posts and relevant cafes of their liking.
- A reliable-trustworthy source of cafe reviews by visualising the degree of authenticity and sentiment of reviews and cafes. This provides a transparent way to check the legitimacy of the information posted and allows users to identify false or fake reviews.

5. Solution, Technology, & Innovation

5.1. Overall Design



5.2. Features

5.2.1. Cafe Reviews

A component of Cafe-enthusiast-specific and Comprehensive Rating service, users can use reviews to share their opinions, provide feedback, and find detailed information about other cafes. It consists of free-text inputs, multiple image uploads, multiple-choice sections and aspect ratings to create a cohesive review by cafe-goers.

The screenshot shows a user interface for a cafe review. On the left, there's a section for adding a review with various aspects to rate. On the right, a specific review is displayed for a cafe named "Tea Time". The review includes a title, posted date, sentiment, and a summary. Below the summary, there are sections for "ASPECT: COFFEE" and "ASPECT: TEA", each with their own rating, beans, leaves, and milk options. A note at the bottom states they serve premium tea with proper brewing equipment.

Images

Drag 'n' drop some images here, or click to select images

Review

A very quaint place and nice tea store~
Posted by: Tea Hero
05/04/2023, 17:42:28
Sentiment: 😊
Authenticity: 79%

Tea Time (茶
侍) **Tea Time**

Add Review (Please fill in aspects if applicable)

Select Cafe Overall Coffee Tea Ambience

Work/Stud
y Friendly Pricing Cuisine Speciality Amenities

Pet-Friendliness

Tea Leaves Selection

Black Green Oolong Pu-erh White

Milk Selection

Low-fat Almond Oat Soy

Thoughts on Tea

They serve premium tea with all the proper tea brewing pots and devices. Each pot can be shared by 2!

★★★★★

Prev Next

Cancel

5.2.1.1. Specific Aspects for Cafes

A component of Cafe-enthusiast-specific service, where for cafes, there are various aspects and specificities in which cafe-goers are more interested than are not covered by existing solutions. By capturing more information, user reviews and impressions of cafes would become more detailed and relevant for the target users.

Here is a list of aspects we have identified that are essential for a cohesive cafe review:

- Coffee:
 - Beans: Arabica, Robusta, Excelsa, and Liberica.
 - Available types of milk: Low fat, Almond, Oat, Soy
 - Caffeine-free option
- Tea:
 - Leaves: Black, White, Green, Oolong, and Pu-erh.
 - Available types of milk: Low fat, Almond, Oat, Soy
- Work/Study Friendly:
 - Charging ports, WiFi.
 - Vital for some customers like students and businessmen. They are cafe-goers who want to stay for long periods at a cafe to do their work. However, not all places are suitable for patrons to study/work either during peak periods or necessary elements.

- Ambience
 - Lighting: Is it conducive for work or more for a casual meet-up?
 - Option of Alfresco dining
 - Vibe: Chill, cosy, rustic, industrial or modern
- Pricing
 - Average pricing and presence of student / elderly deals
- Cuisine (Food)
 - Western / Japanese / Local / None (Just serving drinks)
- Speciality
 - Some cafes may have a unique speciality or niche. e.g. Audiophiles ([Zeppelin & Co](#)), animals ([The Cat Cafe](#)) and themed ([Joji's Diner](#)).
- Amenities
 - Playgrounds, Toilets, etc.
 - In some locations, the cafes may not be in shopping centres and are in deserted areas. Thus, having basic amenities is a crucial consideration.
- Pet-Friendliness
 - Users with pet dogs or cats will find it crucial to know if the cafe allows pets and if they provide water bowls/treats.

5.2.1.2. Custom Aggregated Rating System

A component of the Comprehensive Rating service, rating specific parts of a cafe experience would allow highly particular cafe-goers to find their most suitable cafe.

From each element mentioned in [Section 5.2.1.1](#), users can give a sub-rating. We will use these sub-ratings to calculate an aggregated score for the overall review.

	Casual Coffee	Coffee Connoisseur	Casual Tea	Tea Connoisseur
Coffee	0.4	0.6	0.01	0.01
Tea	0.01	0.01	0.4	0.6
Ambience	0.19	0.08	0.19	0.08
Price	0.1	0.01	0.1	0.01

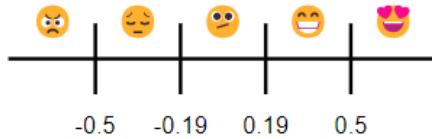
For *Coffee, Tea, Ambience and Price aspects*, it will sum up to 70% of the total weightage.

For the remaining 30%, it will be divided equally among *Work/Study Friendly, Cuisine, Speciality, Amenities and Pet Friendliness aspects*.

For users that are not classified yet, the aspects will be unweighted and have equal weightage. For aspects that are unrated, we will exclude them in the calculation to ensure the rating is not skewed.

5.2.2. Emojified Sentiment of Reviews

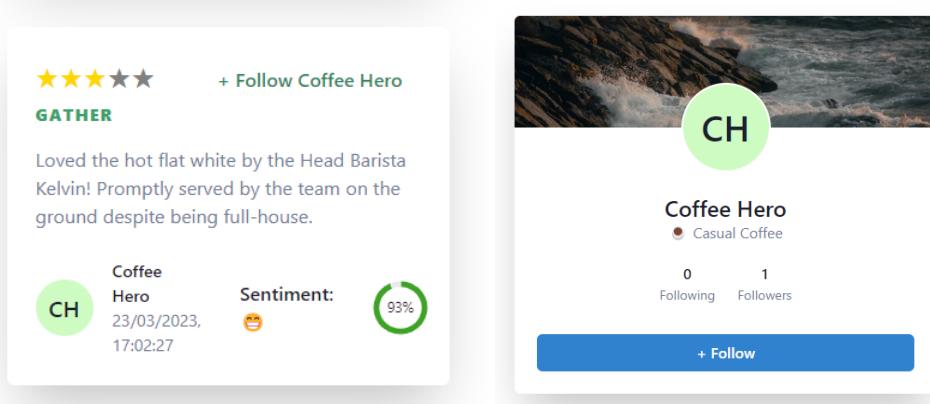
A component of Reliable-Trustworthy service, Cafenaut analyses texts inputted by reviewers and provides a visual representation for users to determine the strength of positivity or negativity of a review and cafe at a glance. Using sentiment analysis, we represent the sentiment of reviews via emojis using this mapping:



For further elaboration on the sentiment analysis technology employed, visit [Section 5.2](#).

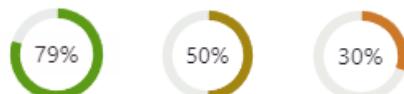
5.2.3. Following & Followers

A component of User service, it allows users to establish explicit social relationships and interact with one another. Presented as a feed of all their *Following* reviews, this would allow users to easily keep up to date with the latest reviews their friends have made and find new cafe spots which otherwise they may not have found by themselves via a map. Vice versa, having *Followers* would encourage a reviewer to post more reviews to grow their sphere of influence and possibly allow communities to form within the application where groups of similar tastes can gather and share about their favourite coffee or tea place.



5.2.4. Authenticity Detection

A component of Reliable-Trustworthy service, Cafenaut defines authenticity as the genuineness and truthfulness of a piece of information. As such, it would enable users to identify how trustworthy a review or cafe is based on a colour scale: green to red in decreasing order of authenticity.



To determine the strength of authenticity, we use various social media technologies and a suspicious/inappropriate report system to generate this percentage:

1. Given all the fields of a review:
 - 1.1. Using *spam* analysis, retrieve the confidence if the review is spam.
 - 1.2. Using *AI content* analysis, retrieve the confidence if the review is generated by a bot.
 - 1.3. Using *sentiment* analysis, retrieve the sentiment score of the review.
2. Calculate the discrepancy between the sentiment and the unweighted aggregate rating:

$$Score = \begin{cases} (rating - Min_{rating}) \times -sentiment, & \text{if } sentiment < 0 \\ (Max_{rating} - rating) \times sentiment, & \text{otherwise} \end{cases}$$

$$Discrepancy\% = \frac{Score}{(Max_{rating} - Min_{rating}) \times Max_{sentiment}}$$

For example, a very positive sentiment review but a low rating may indicate a fake review crafted ingeniously by a bot or a sponsored person.

- Given the review and number of reports, calculate the reported weight of the review.

$$Report = \begin{cases} 1, & \text{if } reports < 2 \\ \log_2(reports), & \text{otherwise} \end{cases}$$

- Calculate the probability of authenticity using:

$$\text{Authenticity\%} = \frac{(1 - \text{Spam\%}) \times (1 - \text{Generated\%}) \times (1 - \text{Discrepancy\%})}{Report}$$

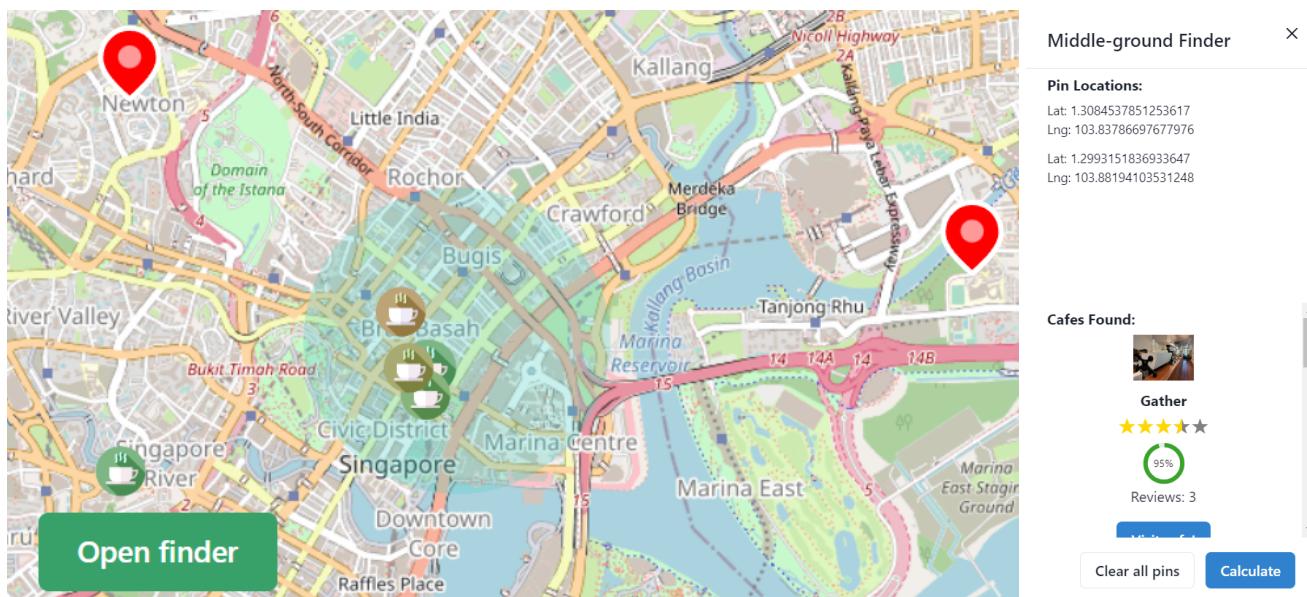
5.2.5. Middle-Ground

A component of Map Recommendation service, given two or more locations, Cafenaut will provide users with a middle-ground/halfway region of at least two cafes and list all the cafes within this region.

Assumption: Cafes more are likely to be located in denser F&B regions, like the central business district (CBD). Hence, we chose the CBD of Singapore as Maxwell Food Centre for this project.

For the implementation of the middle-ground, we use [Geolib by Manuel Bieh](#) to triangulate this region and [Pigeon Maps by Marius Andra](#) as our maps provider:

- Given a list of latitude-longitude coordinates, calculate the centre/midpoint of all coordinates using Geolib.
- Given all cafes, retrieve cafes nearby:
 - Retrieve a list of cafes located within a search radius of a centre.
 - If the number of cafes retrieved is less than two, return cafes found.
 - Otherwise, increment the radius of the search and compute a new centre towards CBD. Repeat 2.1.
- With the new centre and radius, render a circle on the map of the middle-ground region.



5.2.6. Cafe Pins

A component of Map Recommendation service, it enables cafe-goers to see how popular a particular place is on the map and how authentic it is by its size and colour. Moreover, it

allows users to find hidden gems where the cafe might have fewer reviews but high authenticity. Thus, this encourages users to visit these otherwise hard-to-find cafes.

For the implementation of the pins, we use [Pigeon Maps by Marius Andra](#) to render the map:

1. Given all cafes and their respective reviews, retrieve their authenticity and popularity:
 - 1.1. Retrieve the average review's authenticity, and represent it with the colour of the pin: green to red in decreasing order of authenticity.



- 1.2. Retrieve the total number of reviews posted about the cafe, and represent it with the size of the pin: small to large in increasing order of review quantity.



5.3. Uses of Social Media Technologies

5.3.1. Sentiment Analysis for Reviews

To identify and extract subjective information from reviews, Sentiment analysis will allow users to determine the attitude of a reviewer towards a particular cafe aspect, service, or experience. Moreover, as mentioned in [Section 5.2.4](#), deriving the sentiment allows us to find discrepancies in review ratings and determine unauthentic reviews.

For the implementation of sentiment analysis, we use [AFINN-based sentiment analysis by Andrew Sliwinski](#), which uses NLP libraries and pre-processing techniques such as special characters removal, tokenization, and stop words removal, to remove noise and improve the accuracy of the sentiment analysis. After pre-processing, [Sentiment by Andrew Sliwinski](#) would return a numeric score of between -1 to 1 representing the strength of the sentiment.

5.3.2. Spam Detection for Reviews

To protect the integrity of cafes and cafe-goers, message spam detection strategies help to identify and remove illegitimate reviews. Spam reviews can manipulate the rating of cafe stores and mislead potential customers. As such, by detecting spam, we aim to maintain the authenticity of the reviews by flagging them in [Section 5.2.4](#), providing cafe-goers with more transparency on the illegitimacy of the post.

For the implementation of message-level analysis, we use [Spam Detection by Harshit Kohli](#), which utilises the Naive Bayes classifier to retrieve the confidence of spam of a text.

5.3.3. AI Content Detection for Reviews

With the rising popularity of ChatGPT ([Bartz, 2023](#)), there is also an increasing concern for AI-written reviews. Users or even bots can utilise tools such as ChatGPT to produce convincing but inaccurate reviews. Thus, we aim to use AI-generated content detectors to determine a probability of an AI-written review.

For the implementation of bot content detection, we use [AI Content Detector by Writer](#), which operates by identifying patterns in GPT training datasets and models, returning the confidence of a text written by an actual human.

GR

write for new a short review of the cafe kurasu singapore



I'm sorry, but as an AI language model, I cannot provide a review of Cafe Kurasu Singapore as I do not have personal experiences or opinions. However, I can give you some general information about Cafe Kurasu Singapore.

Cafe Kurasu Singapore is a popular Japanese-style cafe located in the heart of Singapore. It is known for its specialty coffee and matcha drinks, as well as its minimalist and cozy interior design. The cafe also serves a variety of Japanese-inspired pastries and light meals, such as mochi, matcha roll cakes, and sandwiches.

Overall, Cafe Kurasu Singapore has received positive reviews from customers for its excellent coffee, cozy ambiance, and friendly service. It is a great place to relax, catch up with friends, or get some work done while enjoying a delicious cup of coffee or tea.

AI Content Detector

If your content reads like it was entirely produced by AI, it may affect how search engines rank it. Use our free detector to check up to 1,500 characters, and decide if you want to make adjustments before you publish.

AI content detection is **only available in the Writer app as an API**, and is limited to checks of 1,500 characters at a time. Find out more in our [help center article](#).

Add a URL

<https://>

Add some text

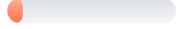
Cafe Kurasu Singapore is a popular Japanese-style cafe located in the heart of Singapore. It is known for its specialty coffee and matcha drinks, as well as its minimalist and cozy interior design. The cafe also serves a variety of Japanese-inspired pastries and light meals, such as mochi, matcha roll cakes, and sandwiches.

589 / 1500 CHARACTERS

Analyze text

9%

HUMAN-GENERATED
CONTENT



You should edit your text until there's less detectable AI content.

5.3.4. User Classification

User profiling based on users' posted reviews is done to recommend and showcase specific reviews that may interest users of specific demographics. By classifying who is using our application, we can highlight reviews and cafes that are more relevant to specific types of cafe-goers via a different aggregated rating value (in [Section 5.2.1.2.](#)).

For the implementation of this user classification, we use [ClassifyText by André Ekeberg](#), which uses n-grams and cosine similarity to classify users based on their review language use.

The process of classification is as such:

1. Given all the reviews of a user:
 - 1.1. With the review body, coffee free-text, and tea free-text:
 - 1.1.1. Classify connoisseur or casual based on the Expertise model
 - 1.1.2. Classify coffee or tea based on the Beverage model
 - 1.2. If unable to be determined, return unweighted.
 - 1.3. Otherwise, return the [Expertise and Beverage] classification.
2. With all the classifications, calculate the top occurrence classification.
3. Update the user's classification accordingly.

When classifying Expertise, Cafenaut defines a connoisseur as a person who knows a lot about coffee/tea and is familiar with different roasts/brews, various flavour profiles, types of beans/leaves, and where they originate. On the other hand, a casual person is someone who knows little technical terms and does not make detailed comments about any of the roasts/brews, flavours, etc. Thus, to train the Expertise model, we utilised data from Google Reviews from users with a level < 7 and Burpple, versus Google Reviews from users level >= 7 and various blogs, labelling them as either *Casual* or *Connoisseur* respectively.

For classifying Beverages, we utilised data from Google Reviews, Burpple, and blogs, labelling posts as either *Coffee* or *Tea* if the text only contains coffee or tea terms accordingly.



Tea Hero
Tea Connoisseur



Coffee Hero
Casual Coffee

For example:

- Connoisseur: “These are robust, with fruity undertones, and a slightly acidic finish”, “Coffee is well made, using a single origin blend from Dutch Colony”, etc.
- Casual: “Great food, great coffee and super friendly staff”, “A great place for a coffee and dessert”, etc.
- Coffee: “Some of the best coffee beans you can find in Singapore”, “Love the coffee here: nice beans, not acidic, great milk to espresso ratio”, etc.
- Tea: “Green teas are infused with dried flowers like jasmine, marigold, and carnation”, “Blissful berries, earl grey, anti-stress and longan paradise”, etc.

6. Testing and Discussions

6.1. Testing

In this section, we will be demonstrating various use cases, scenarios, and workflows in which cafe-goers may interact with our application.

As a user, I would like to create reviews easily so that I can share my opinions on a cafe.

The screenshot shows the 'Add Review' page of the Cafenaut application. At the top, there's a header with 'Add Review' (in a green button), 'Home', 'Explore', 'Cafes', 'Maps', and a user icon. Below the header is a title 'Add Review (Please fill in aspects if applicable)'. A numbered sequence of 11 steps is displayed, starting with 'Select Cafe' (step 1, checked) and ending with 'Pet-Friendliness' (step 11). The steps are: 1. Select Cafe, 2. Overall, 3. Coffee, 4. Tea, 5. Ambience, 6. Work/Study Friendly, 7. Pricing, 8. Cuisine, 9. Speciality, 10. Amenities, 11. Pet-Friendliness. Below these steps are input fields for 'Review Title' and 'Overall Thoughts', and a 'Images' section with a placeholder 'Drag 'n' drop some images here, or click to select images'. At the bottom are 'Prev' and 'Next' buttons, a red 'Cancel' button, and a close 'X' button.

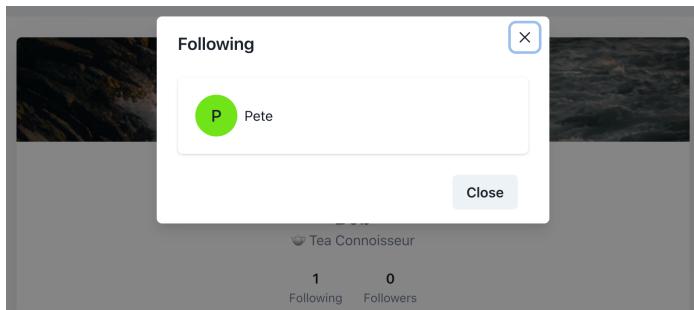
As a user, I would like to view a cafe review based on aspects so that I can easily analyse the review based on my needs.

The screenshot shows the 'Review' page of the Cafenaut application. It displays a review for 'Tea Time' with a summary rating of 4 stars. The review text is: "A very quaint place and nice tea store~". The review is posted by 'Tea Hero' on 05/04/2023, 5:42:28 pm. The sentiment is ':)' and the authenticity is 79%. The review is categorized under 'Tea Time (茶侍)' and 'Tea Time'. The review is summarized as follows:

Aspect	Rating	Details
SUMMARY	★★★★★	Nice experience. Might come back when I want to pamper myself.
ASPECT: COFFEE	★★★★★	Beans: Arabica, Excelsa, Liberica, Robusta. Milk options: Low Fat, Almond, Oat, Soy. Non-caffeinated option.
ASPECT: TEA	★★★★★	Leaves: Black, Green, Oolong, Pu-erh, White. Milk options: Low Fat, Almond, Oat, Soy.
ASPECT: AMBIENCE	★★★★★	Alfresco option. Lighting: Vibes: Love the design.
ASPECT: WORK/STUDY FRIENDLY	★★★★★	Charging Ports: WiFi.
ASPECT: PRICING	★★★★★	Average Price (\$): 50. Elderly, Student.
ASPECT: CUISINE	★★★★★	Serves food: Handmade mochi was decent but nothing I would rave about.
ASPECT: SPECIALITY	★★★★★	None.
ASPECT: AMENITIES	★★★★★	

A review is segregated based on their aspects and respective sub-ratings.

As a user, I would like to view my following / followers so that I can see how influential my reviews are.



Under the Profile page, users can view the number of following and followers, and click on it to see their list of users, which they can click on to visit their profile.

As a user, I would like to have review ratings tailored for me based on my drink preferences (Coffee / Tea Casual / Connoisseur).

Bob
Tea Connoisseur

★★★★★
TEA TIME (茶侍)

A very quaint place and nice tea store~

Nice experience. Might come back when I want to pamper myself.

Tea Hero
05/04/2023, 5:42:28 pm

Sentiment: 😊

Bob
Coffee Connoisseur

★★★★★
TEA TIME (茶侍)

A very quaint place and nice tea store~

Nice experience. Might come back when I want to pamper myself.

Tea Hero
05/04/2023, 5:42:28 pm

Sentiment: 😊

For example, the review above is for a tea place and does not serve coffee. For a user of the classification tea connoisseur, it will have a higher rating (3.5) than a coffee connoisseur (1).

As a user, I would like to explore reviews that are written by users I have not followed to gain a broader perspective of reviews.

Home Explore Cafes Maps

Search Filters

Cafenaut's Explore page will show all reviews posted by the community.

★★★★★
PLAIN VANILLA TELOK AYER

Ok coffee, ok ambience

Nice place to hang out with friends.

Bob
08/04/2023, 20:25:35

Sentiment: 😊

As a user, I would like to explore reviews that are written by users I have followed to keep up-to-date.

Home Explore Cafes Maps

Search Filters

Cafenaut's Home page will show all reviews posted by the users that they followed.

★★★★★
PLAIN VANILLA TELOK AYER

Ok coffee, ok ambience

Nice place to hang out with friends.

Bob
08/04/2023, 20:25:35

Sentiment: 😊

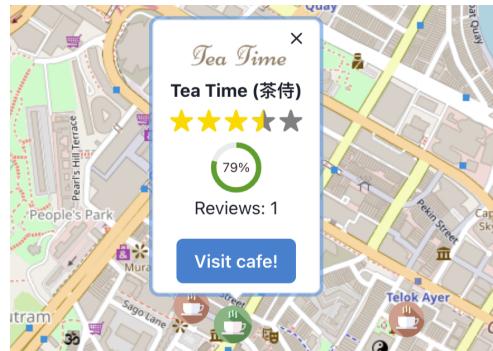
As a user, I would like to view all reviews written for a particular cafe so I can make an informed decision about visiting the cafe.

The image shows a grid of six cafe cards and a detailed review page for Toby's Estate Coffee Roasters.

- Top Row:**
 - CAFÉ LIMONCI**: Five-star rating, 1 review.
 - THE FOOD PEEPS COFFEE AND DELI**: Five-star rating, 1 review.
 - GATHER**: Four-star rating, 1 review.
- Bottom Row:**
 - PLAIN VANILLA**: Five-star rating, 1 review.
 - TORY'S ESTATE COFFEE ROASTERS**: Five-star rating, 1 review.
 - PS.Cafe**: Five-star rating, 1 review.
- Toby's Estate Coffee Roasters Review Page:**
 - Overall Statistics:** Five-star rating, 1 review, 93% authenticity.
 - Review Content:** "Definitely worth visiting again. Very comfortable and good food".
 - Review Author:** Coffee Hero, 05/04/2023, 3:55:08 pm.
 - Sentiment:** 93%.

Under the cafe page, we present the users with a grid of cafes, and the user can select a particular cafe to view the reviews for it.

As a user, I would like to view the authenticity of a particular location, where I can see how many reviews there are and how credible these reviews are so that I can easily decide which cafe to visit.



Under the Maps page, users can see at a glance the authenticity of the cafe reviews by its colour, and the popularity based on the size of the cafe pin.

Additionally, users can view more details about the cafe of interest by clicking the pin to view the number of reviews and authenticity percentage of the cafes.

As a user, I would like the option to report a suspicious review if it seems unauthentic.

Spot a suspicious review? **Report**

At the bottom of a review, there is a report button provided, which may affect the review's authenticity score.

As a user, I would like to plan potential cafes to visit based on my friend's location so that we can go to an accessible cafe for both parties.

The image shows a map interface for finding cafes near a friend's location.

- Left Panel:** Shows a map of Singapore with several cafe icons. A red pin marks a location in the Bugis area. A callout box contains:
 - Add finder pin** button
 - Clear pins** button
- Right Panel:** Shows a detailed map of the Singapore CBD area with a red pin marking a location in the Raffles Place area. A callout box contains:
 - Middle-ground Finder** title
 - Pin Locations:**
 - Lat: 1.3020603236553265
 - Lng: 103.84581666994603
 - Lat: 1.2965471198151064
 - Lng: 103.87149736996003
 - Cafes Found:**
 - Gather**: Five-star rating, 95%, 3 reviews.
 - Buttons:** **Clear all pins**, **Calculate**.

Middle-ground Finder enables users to drop two location pins to get a list of cafes to visit in their vicinity.

6.2. Discussion

After putting our application through our testing workflows ([Section 6.1](#)), we have identified a few strong and weak suits of our current implementation of Cafenaut.

6.2.1. Strengths

- Our multi-step process to create a review enables users to provide valuable inputs to a cafe, where the prompts will help the user to address common questions in a cafe.
- Our custom rating for the user depending on their classification is useful, as it helps the users get a more representative rating.
- Our application encompasses features that the user would typically do before visiting a cafe: Reading authentic reviews on it, and checking if the location of the cafe is convenient for the user and friend. This all-in-one approach helps the user save time.

6.2.2. Weaknesses

- With our multi-step process to create a review, it might deter some users from doing so as it is more tedious. However, we believe it is vital for a user to create a quality review, instead of allowing them to create a review with just a rating. We believe that Quality > Quantity.
- Middle-ground Finder requires the user to manually pin their locations, which the user needs to find their location on the map. An improvement is to enable address input to place the pin.

Overall, we believe Cafenaut's strengths outweigh its inconveniences, and with some improvements, it can be a valuable tool for cafe-goers.

7. Conclusion

7.1. Achievements

The rise of cafes popping up all over Singapore and online review platforms has led to increasing demand for in-depth cafe-centric information and the rise in malicious actors, threatening the authenticity of reviews and the reputation of businesses.

In this report, we presented Cafenaut as a solution to provide cafe-goers with a convenient, reliable and trustworthy source of cafe reviews. With its unique features, such as a comprehensive rating system and the ability to find cafes based on location, Cafenaut offers an enhanced cafe-searching experience for users. By enabling cafe-goers to connect and follow, Cafenaut also promotes a sense of community and encourages the discovery of hidden treasures in the Singapore coffee and tea landscape. In conclusion, Cafenaut provides a valuable service to cafe-goers in Singapore, ensuring that they can make informed decisions and discover new and exciting cafe options.

7.2. Limitations

As with many products, Cafenaut suffered from some limitations beyond our control.

- Cafenaut relies heavily on user-generated content and its user participation. Without an active user base, the platform may not provide enough content. Consequently, the authenticity of the reviews and cafes may not be accurate due to the small sample size

or unreliable because of a change in cafe management or no reviews for new establishments.

- It may be challenging for Cafenaut to attract users initially as there are already many existing food review platforms available, and users may not see the need to switch to a new platform.
- It is infeasible for Cafenaut to capture every single cafe. It would be challenging to ensure that the platform remains up-to-date with every new cafe opening and closing down potentially daily.
- The success of Cafenaut also depends on factors outside its control, such as changes in the cafe industry and consumer preferences. For example, if cafe-goers shift towards healthier options, cafes that specialise in desserts or pastries may become less popular, affecting the platform's content and usefulness.
- Detection of fake reviews is not 100%, and manual intervention may be necessary to mark untrustworthy reviews as invalid and remove them from the system. In particular, the detection of content written by ChatGPT or similar AI-generative apps is inaccurate when given short texts.

In conclusion, while Cafenaut shows promising potential in addressing the current issues faced by online food review platforms in Singapore, there are limitations to its accuracy, reliability, and scalability. Therefore, these limitations should be considered when evaluating the usefulness and future directions for the application.

7.3. Future Improvements

As mentioned above, there are still several areas for improvement that can enhance the user experience and expand Cafenaut's capabilities.

- Adapting this web application to a native mobile application would enable it to track active user location, similar to Google Timeline, which would allow us to verify the cafes a user has visited and use their GPS location to find the middle-ground with their friends.
- Incorporating more community engagement through *Likes*, *Dislikes*, *Comments*, and more media options like *videos* (making reviews multidimensional) would increase the variety of information that cafe-goers and businesses can use to evaluate suitable cafes and gain insights into customer behaviour and preferences.
- Developing a sharing feature for users to post on other social media platforms would be an effective way to increase user engagement and attract new users to Cafenaut.
- Expanding the coverage of the app beyond Singapore, by including other popular coffee destinations like Tokyo, Melbourne, or New York, would enable users to discover cafes in different parts of the world, creating a global community of cafe enthusiasts. However, this expansion would require a significant increase in the number of cafes listed on the app and collaboration with local cafe experts in each city to ensure accurate and up-to-date information.
- Integrating features that allow users to make reservations or place orders through the app would enhance the convenience and streamline the visiting process.

In conclusion, while Cafenaut is a comprehensive platform for cafe-goers, there is still room for improvements that could enhance the overall user experience and attract more users to the app. These additional features would require close collaboration with cafe owners and experts in the cafe industry, as well as significant investment in app development and marketing efforts. However, the potential benefits of these improvements justify the effort and investment required.