Lab 2: Information Retrieval

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1. Requirements of an Image Search Task

An effective image search system should enable users to:

- **Upload an image as a query**

  This feature allows users to provide an image as input for the search engine, which then retrieves visually similar or relevant images based on the query. The system can accept various image formats and should handle potential errors, such as unsupported file types or large file sizes.

- **Preview the query image**

  Once an image is uploaded, it should be displayed as a preview within the search interface. This allows users to verify that the correct image has been selected and to make adjustments if necessary. The preview should be a scaled-down version of the original image to save bandwidth and reduce loading time.

- **Initiate the search using the query image**

  Users should be able to start the search process with a simple click of a button. The search engine then analyzes the query image and retrieves matching results based on its visual features, metadata, or other criteria. The search should be efficient and optimized to return relevant results in a timely manner.

- **Review the search results with an overview and options to refine the search**

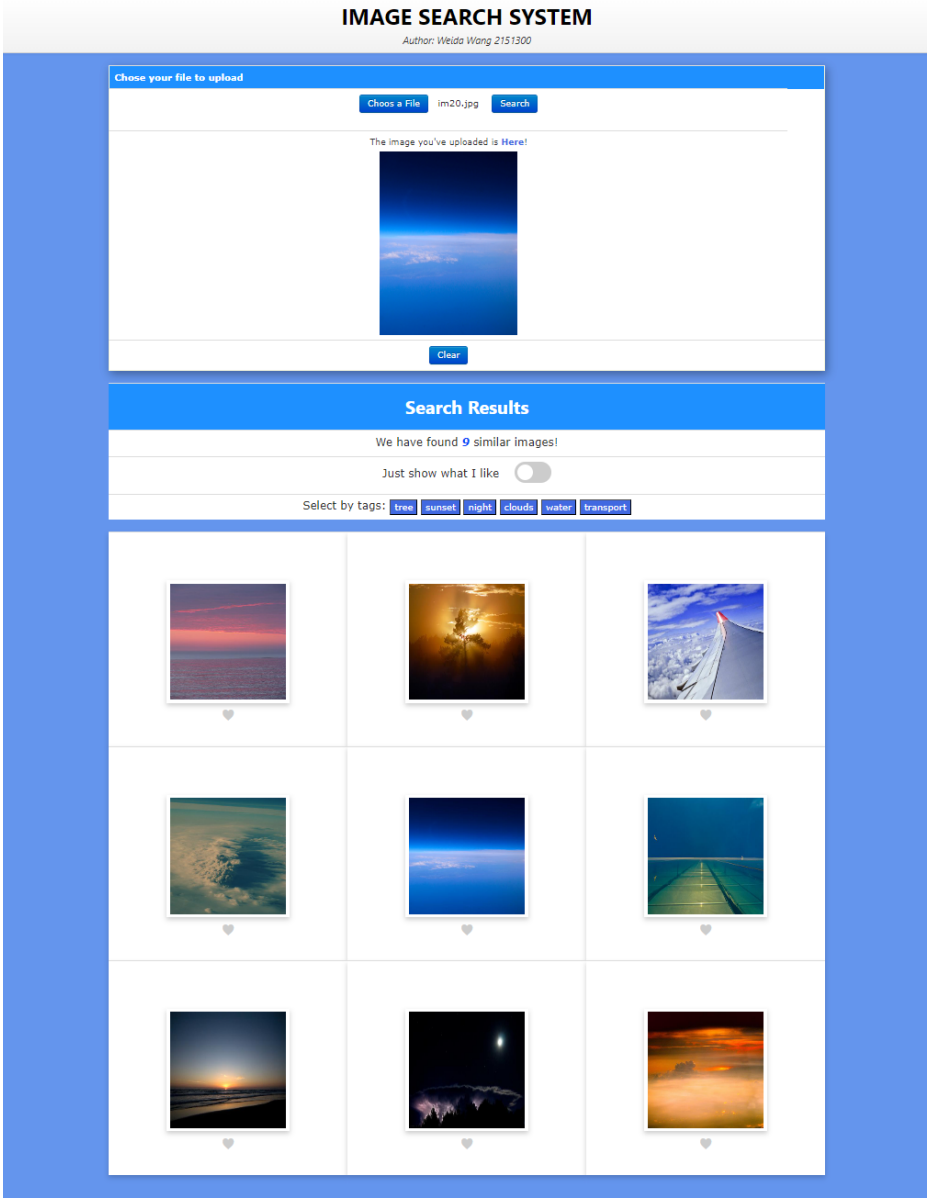
  The system should display a brief overview of the search results, including the total number of results and any relevant information. Users should be able to review the results in a user-friendly format, such as a grid or list view with thumbnail previews, image titles, and other metadata. Additionally, users should be able to refine their search by modifying parameters like categories, tags, or other filters, and sort the results by relevance, date, or other criteria.

- **Interact with the results, such as adding images to a favorites list**

  Users should be able to perform various actions on the search results, including adding images to a favorites list or a custom collection, downloading images for personal use, and sharing images through email, social media, or other platforms. The system should also provide options for users to report inappropriate content or request more information about a particular image.

By incorporating these features, the image search system will offer a comprehensive and user-friendly experience, allowing users to find relevant images easily and efficiently.

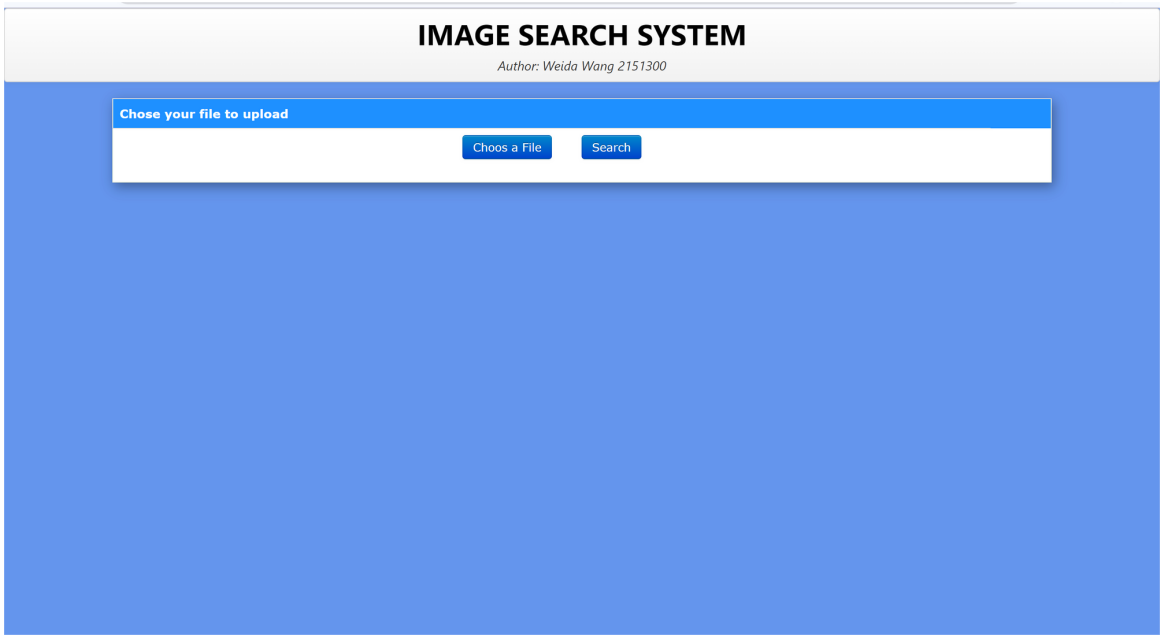
2. Page Overview



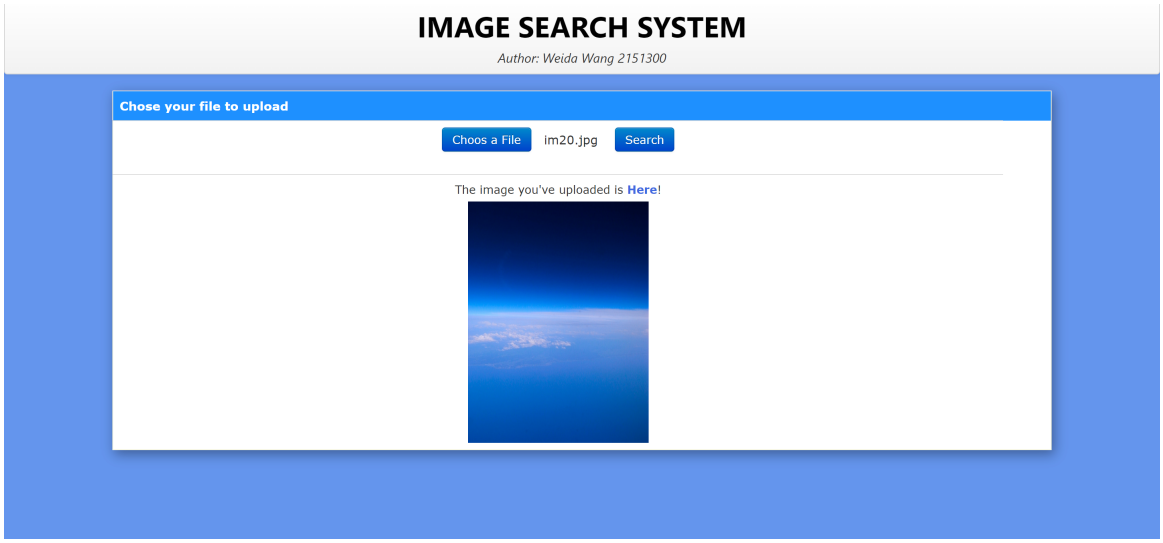
3. Design and Implementation of the Five-Stage Framework

3.1. Formulation Stage

- Include an input box for users to upload images: This input box should support uploading different types of images to provide a smooth user experience. Supported formats here include 'png', 'jpg' and 'jpeg'.

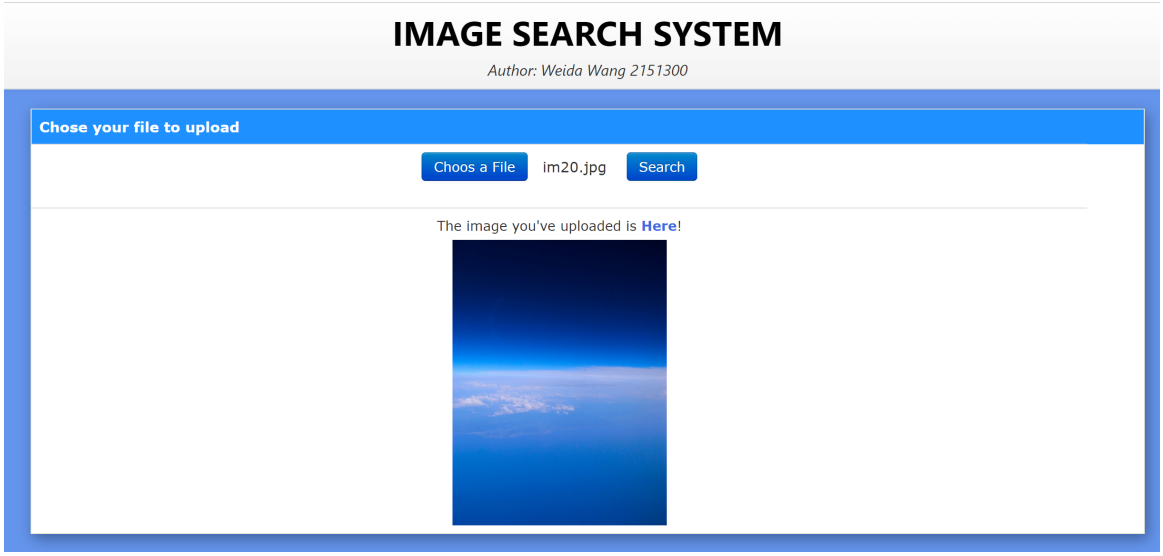


- Show a preview of the uploaded image in the search window: the preview should be a reduced version of the original image to save bandwidth and reduce loading time. Also, the name of the uploaded image can be displayed next to the input box to check if it has been uploaded correctly. If it is not correct you can click on the `Choose a File` button to re-upload it.



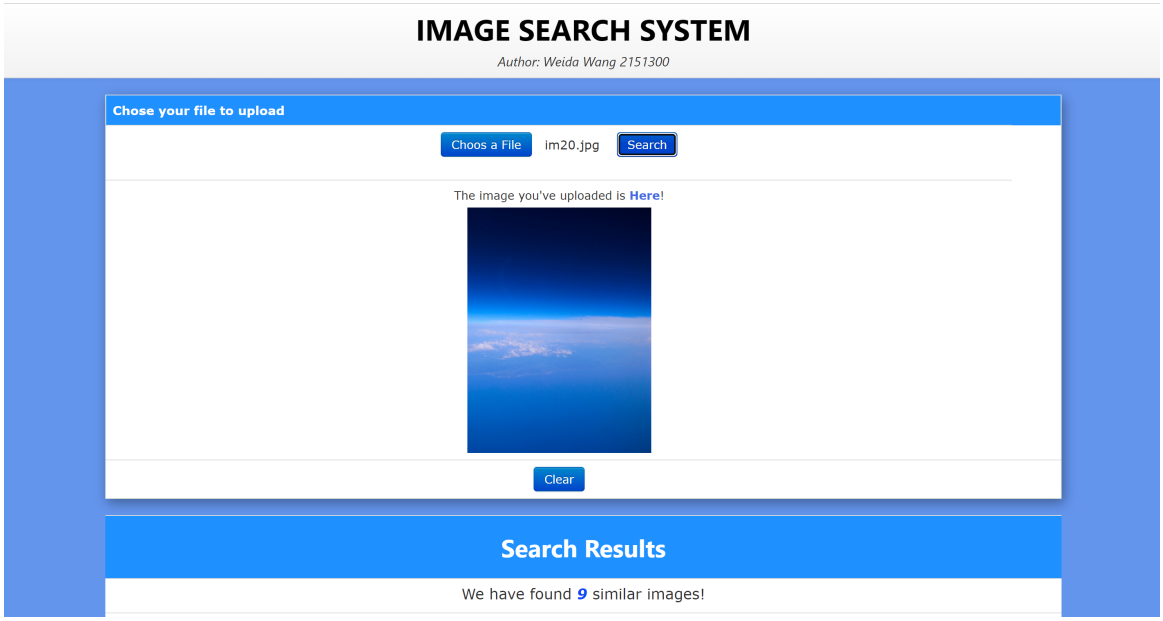
3.2. Initiation Stage

- Add a search button for users to initiate the search using the uploaded image: The `Search` button should be prominently displayed and easily accessible, enabling users to start the search process with a single click.

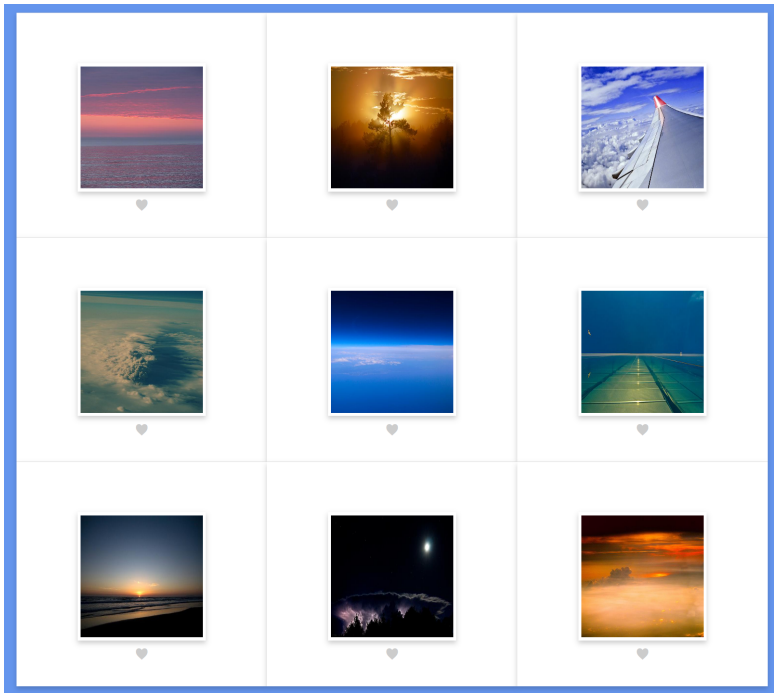


3.3. Review Stage

- Display an overview of the search results, including the total number of results found: This overview should be presented in a concise and easily understandable format, allowing users to quickly gauge the effectiveness of their search query.

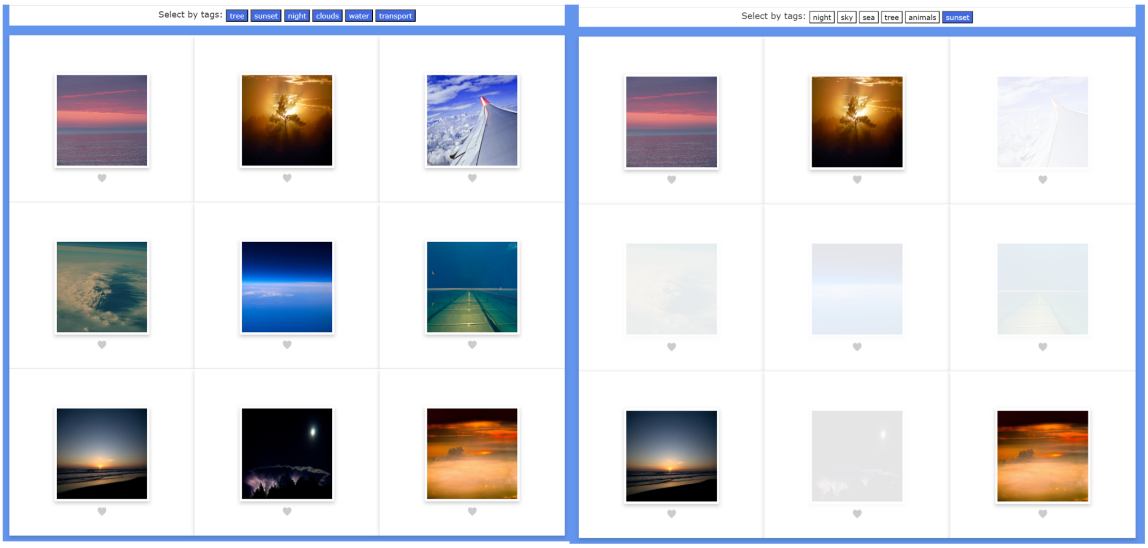


- Display results in a grid format with thumbnail preview: Each result should be displayed as a thumbnail image. This format allows the user to quickly navigate through the search results and identify images of interest.



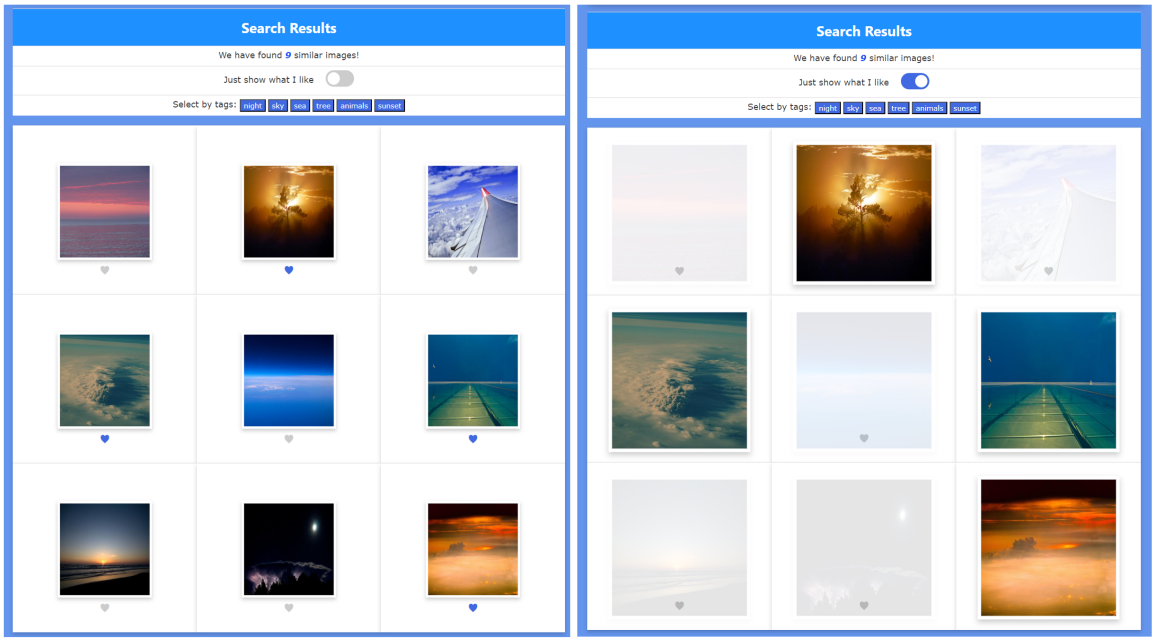
3.4. Refinement Stage

- Allow users to modify search parameters to refine their search results by selecting certain categories or tags: Users should have the option to narrow their search results by applying filters, such as specific categories or tags. These filters are easily accessible and clearly labelled.



3.5. Use Stage

- Enable users to interact with search results: Users can mark their favourite images by highlighting the hearts below them and view only their favourite images by clicking on the `Just show what I like` slider, which hides the unlit hearts. 【Additional】 At the same time, the whole process will change the size of the image, making the interaction more fluid.



- 【Additional】Image display size can be modified: to make it easier for users to view the images and select their favourite ones, the images can be scaled by clicking on them.