**System Requirements Corresponding to Functional Requirements**

***Basic Search***

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| **SFR1:** | The user shall be able to search for organisms by typing the common name or the scientific name into a search bar. The search bar will have a 255 character limit. |
| **SFR2:** | A user’s search will generate a maximum of 10 results at a time. The user can click a view more results option to view 10 more results. |
| **SFR3:** | Each image image in the selectable list will be 400px by 400px. The image will appear to the left of each species result. |
| **SFR4.1:** | The application shall ask the user for access to his or her location upon initial use of the “What’s Around Me?” button. |
| **SFR4.2:** | The user’s GPS location will be used as the center point of the area searched. |
| **SFR4.3:** | This feature will not work unless the user allows the application to use their GPS location. |
| **SFR5:** | The application shall keep a record of a total of 20 past searches before automatically clearing the least recent search. |
| **SFR6:** | The search bar shall produce radio buttons when the user begins typing that he or she can select to specify their search. The default search is by common name. |

***Filter***

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| **SFR7.1:** | The filter menu shall have a check box for the user to select to use their GPS to narrow his or her results. |
| **SFR7.2:** | The GPS filter shall have a text box which will allow the user to enter a specific radius. This text box will prohibit the user from entering invalid numbers (such as 0, letters, or negative numbers). |
| **SFR8:** | When the user selects to filter by state, the filter menu shall have a drop down of all the states from the APIs. |
| **SFR9:** | The user shall only be able to select or search by county/parish/organized borough if a state has already been specified. |
| **SFR10.1:** | |  |  | | --- | --- | | **Taxonomic Ranks** | **Examples** | | Kingdom | Animalia, Plantae, Fungi, et al. | | Phylum | Acanthocephala, Bryophyta, Ascomycota, Cercozoa, Deferribacteres, Korarchaeota, et al. | | Class | [Mammalia](https://en.wikipedia.org/wiki/Mammalia), [Maxillopoda](https://en.wikipedia.org/wiki/Maxillopoda), [Sauropsida](https://en.wikipedia.org/wiki/Sauropsida), et al. | | Order | [Primates](https://en.wikipedia.org/wiki/Primates), [Procolophonomorpha](https://en.wikipedia.org/wiki/Procolophonomorpha), Carnivora, et al. | | Family | Felidae, Canidae, Ursidae, Mustelidae, et al. | | Genus | [Acomys](http://1kai.dokkyomed.ac.jp/mammal/en/genus/acomys.html), [Viverra](http://1kai.dokkyomed.ac.jp/mammal/en/genus/viverra.html), [Zalophus](http://1kai.dokkyomed.ac.jp/mammal/en/genus/zalophus.html), et al. | | Species | Linyphiidae, Hypericum, Rosa, et al. |   **Table 1:** This table shows the taxonomic classification levels that the user would be able to search from, with example usage under ‘Examples.’ |
| **SFR10.2** | The taxonomic filter should be a text box that allows the user to enter the taxonomic name that they want to filter results by. |
| **SFR11:** | After the user selects the event date filter, three drop-down bars shall appear for the user to select month, day, and year. |
| **SFR12:** | The user shall not be able to filter by GPS location and state or state with county at the same time. |

***Species Page***

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| **SFR13:** | The species page will have a larger picture for the user to view along with a description of the species beneath it. |
| **SFR14:** | The MediaWiki API will provide a response which can be formatted in a WebView showing the Wikipedia page for the species. |
| **SFR15:** | |  |  | | --- | --- | | **Citation Information** | **Example or Required Inputs** | | Data Provider or Owner Name | Field Museum of Natural History or Gordon, J. | | Resource or Dataset Name | U.S. Bird Occurrences | | Publisher [Data Provider name, address or affiliation(s)] | Field Museum of Natural History, Museum of Vertebrate Zoology, University of Washington Burke Museum, and University of Turku | | Service Used to Access | *Biodiversity Information Serving Our Nation (BISON)* | | URL | *https://bison.usgs.gov* | | Date | YYYY-MM-DD |   **Table 2:** This table shows the information to cite for the used data from the BISON API. |

***Personal Recordings***

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| **SFR16:** | The application shall request access to the mobile device’s camera before the user is able to use the personal recordings functionality for the first time. |
| **SFR17:** | The application shall request access to the mobile device’s microphone before the user is able to use the personal recordings functionality for the first time. |
| **SFR18:** | The user shall specify a title name for the recording or combination of recordings. |
| **SFR19:** | When uploading the image or audio recording, the application shall prompt the user with a dialog where they can select the location where the image or audio recording was taken. |
| **SFR20:** | Each of the user’s recordings shall be in a selectable list by title. Upon selection, the user will be moved to a page with those specific recordings. |

***Downloading***

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| **SFR21:** | The application shall only be able to download 100MB of data for offline use. |

***Settings***

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| **SFR22:** | The settings button shall always be accessible to the user no matter which page they are currently viewing. |
| **SFR23:** | The toggle shall be set as on by default (showing the preview images). |
| **SFR24:** | The application shall prompt the user with a dialog to make sure he or she is sure about their decision to clear the search history. |
| **SFR25:** | The application shall prompt the user with a dialog to make sure he or she is sure about their decision to clear the cache of downloaded data. |
| **SFR26.1:** | The settings shall have a text box which will allow the user to enter a specific radius for the “What’s Around Me?” button. This text box will prohibit the user from entering invalid numbers (such as 0, letters, or negative numbers). |
| **SFR26.2:** | |  |  |  | | --- | --- | --- | | **Toggle for Images** | Enabled | When the toggle switch is enabled, a user’s search will generate images of the organisms returned from the search. | | Disabled | When the toggle switch is disabled, a user’s search will not generate images of the organisms returned from the search. This will decrease load times if the user has poor cellular connection. | | **Clear Searches** | This will be a clear history button that will clear the user’s search history when pressed. | | | **Clear Downloaded Data** | This will be a clear cache button that will clear all downloaded data from the user’s cache when pressed. | | | **Mile Radius Selection** | This will be a drop-down bar that allows the user to select a 5, 10, 25, 50, or 100 mile radius. | |   **Table 3:** Above is a table that describes how each of the settings in **FR21 - FR24** will be handled in the settings menu of the application. |

***Map***

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| **SFR27:** | The BISON Web Map Service will be used to render data retrieved from BISON in Google Maps. |
| **SFR28:** | Clicking the observation on the map should prompt the user with a dialog containing the observation name and a button to move to the species page (where there will be more information). |

***Basic Features***

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| **SFR29:** | This banner shall be visible on all pages of the application. |
| **SFR30:** | The help page shall have a tab for each feature of the application. Clicking on the tab will provide a tutorial on the selected feature. |
| **SFR31:** | |  |  | | --- | --- | | **APIs** | **Usage** | | Biodiversity Information Serving Our Nation (BISON) | The BISON API can retrieve a list of occurrences for a given species by searching using the selected state and county or entering latitude and longitude. | | Encyclopedia of Life (EOL) | The EOL API can search for a specific species and obtain information such as physical descriptions, habitat, images, and a map of known areas in which the species lives. | | Global Biodiversity Information Facility (GBIF) | The GBIF API can search for a species using its scientific and common name, habitat, family, etc.  The GBIF API allows for the ability to create and edit information in their data system. Additionally, this API can search occurrence records in the GBIF archive, and it offers a mapping service. |   **Table 4:** The above table shows the APIs that will be used and how they will be implemented |
| **SFR32:** | The back button that leads to a previous search will restart the user at the top of the selectable list. |

***Image Recognition***

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| **SFR33.1:** | Google’s Vision API shall be used to recognize the species within the image. |
| **SR33.2:** | The user can select the organism within the image to remove the noise from the image. |

**System Requirements Corresponding to Nonfunctional Requirements**

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| **SNFR1:** | The untrained user should only need 30 minutes to become completely familiar with navigating through the app and utilizing its features. |
| **SNFR2:** | The developer will use direct proportion (dp) which will allow the layouts to change size based on the proportions of the screen. |
| **SNFR3:** | The application should not take longer than 10 seconds to load data from searches. |

**Requirements Affected**

1. FR2
2. FR3
3. FR10
4. FR12
5. FR16
6. FR17
7. FR20
8. FR22
9. FR29
10. FR30
11. FR32
12. FR33
13. NFR1