

Mechanatee Software User Manual

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I. Introduction

A. Overview

The Mechanatee Biomimetic Remotely Operated Vehicle (B.R.O.V.) Software is intended to exist side by side harmoniously with the mechanical end of the system. While this system focuses on the post-processing of images, the physical mechanatee is under development. We aim to provide a clear and concise way to monitor populations living in Floridian waters. Designed to be an underwater B.R.O.V., Mechanatee is to have an unobtrusive relationship with its environment, being careful not to disturb wildlife while collecting vital research data.

B. Audience

While any individual can use the Mechanatee software, its intended audience is researchers, students, developers, and those interested in medical imagery through the power of artificial intelligence. The system is designed in such a way as to aid those looking to process and sort images obtained from research missions, which may include video or individual images. The idea is that after a video is captured of the environment in which manatee populations are visible, the user can upload those images and have the system sort out which do and do not contain manatees. After obtaining those images, the user can upload them to the injury recognition portion of the software, identify those in need, and take the necessary action.

C. System Requirements

The software should run on any browser in an ideal situation. However, with current restraints, the system works best on a non-chrome browser. This can include Mozilla Firefox, Microsoft Edge, or others. If used on Google Chrome, there is the risk that the uploaded images may not be processed correctly by the browser and, therefore, not sent to the backend where the recognition and classification are handled. You may try Chrome, but other browsers may work better. The following directions are given in the Windows command prompt only.

II. Getting Started

A. How to access the system

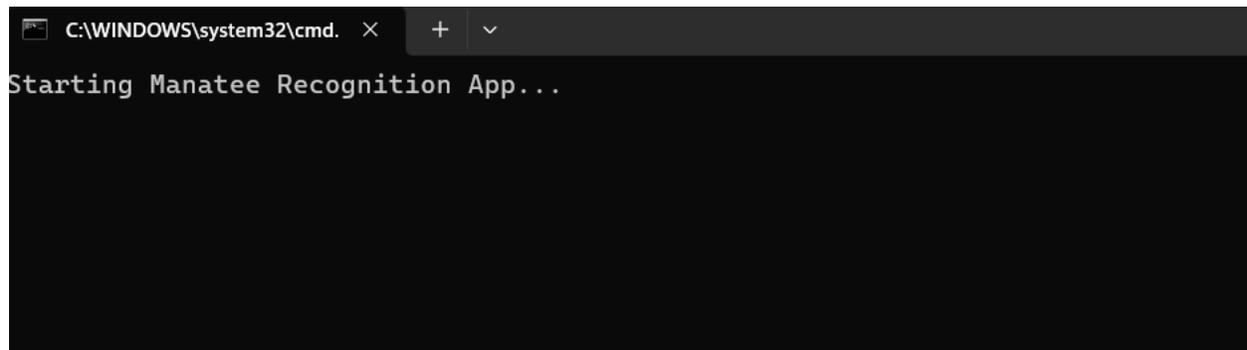
The application is currently housed on a USB drive, accessible by most computers. In the USB, you will see a file system similar to:

```
/manatee-recognition/  
├── backend/  
├── data/  
├── frontend/  
├── model/  
├── .gitattributes  
└── start-all.bat
```

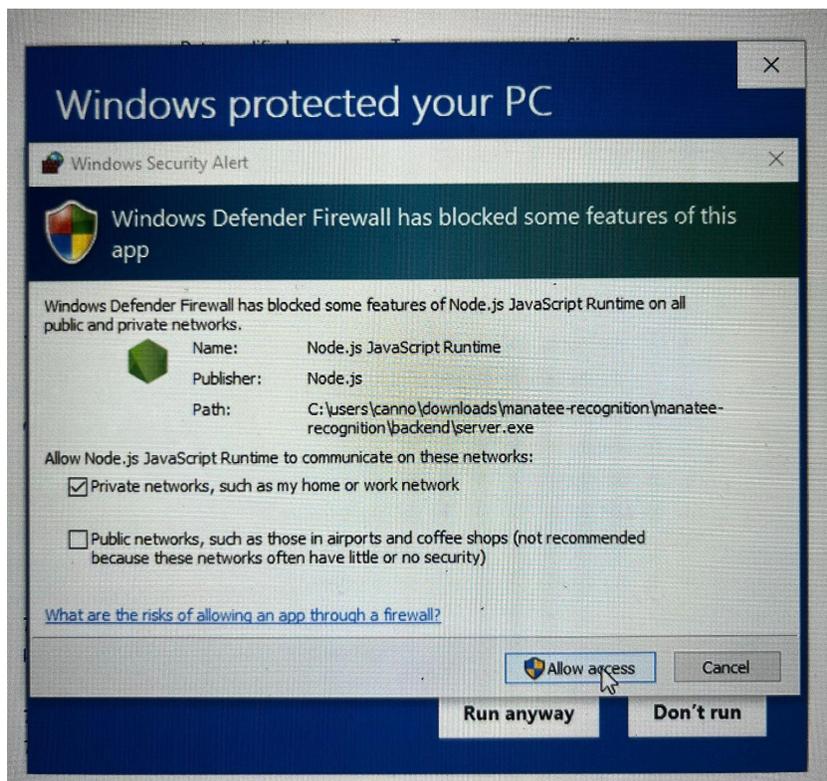
You do not need to worry about any other file other than the `start-all.bat` file. This `.bat` file stands for *Windows Batch File*, which means that this is only able to run on a Windows 64-bit system. Chances are you don't have to worry about this, but it's something to keep in mind in case you run into any errors.

The backend file hosts the server, while the model folder hosts the primary Python application that will give you the application's injury recognition and classification features. That's why when you run the app, you may have to "trust" it on your computer twice: one for the `server.exe` and one for the `app.exe`. These files are safe, and no further concern is necessary from the user.

So, going forward, start by double-clicking on the `start-all.bat` file to get things running. A command prompt window will appear saying "Starting Manatee Recognition App...". This is confirmation that the batch file is successfully running and getting the application prepared to use.



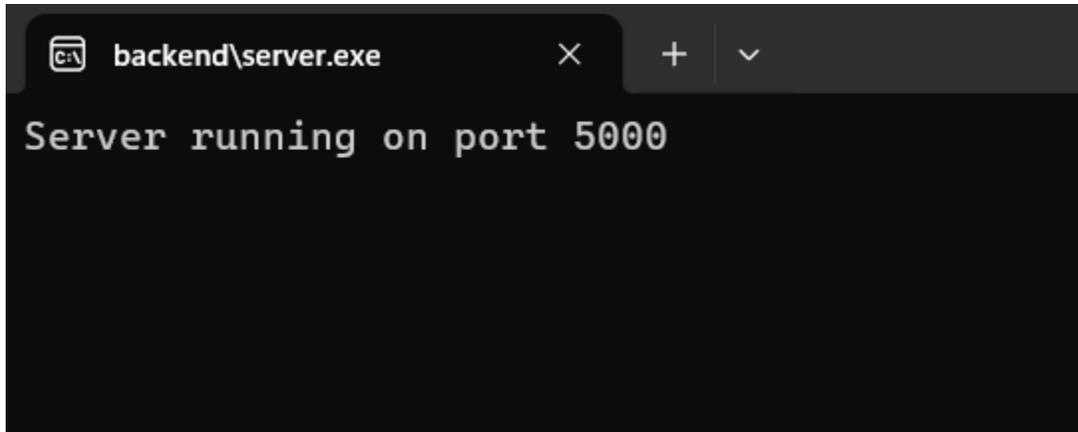
The first time you use the application, be prepared to have your computer "trust" the application twice. Those notifications may look something like this or a little simpler, depending on your version of Windows. Either way, click the option that allows the application to run.



These notifications may say “Allow access,” “Run anyway,” or simply “Allow.”

Trusting these is essential to having the application work properly. Sometimes, you can get away with using the instance segmentation model without trusting *app.exe*, but it is unlikely.

Once the server is correctly running, another command prompt will pop up saying “Server running on port 5000”. This means the application is correctly up and running. If the application does not automatically run, please go to your browser and type “localhost:5000”. This should bring up the application.

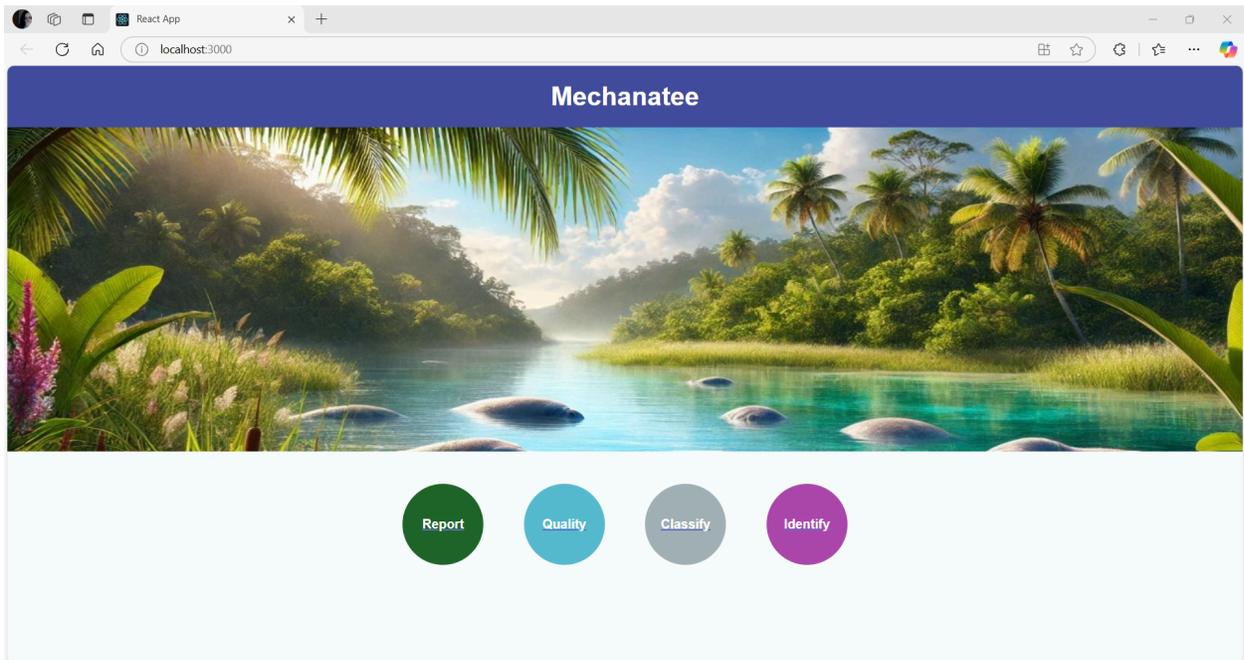
A screenshot of a terminal window with a dark background. The title bar at the top shows a file icon, the text "backend\server.exe", and standard window controls (close, maximize, minimize). The main content of the terminal is the text "Server running on port 5000" displayed in a light-colored monospace font.

III. User Roles & Features

A. End Users

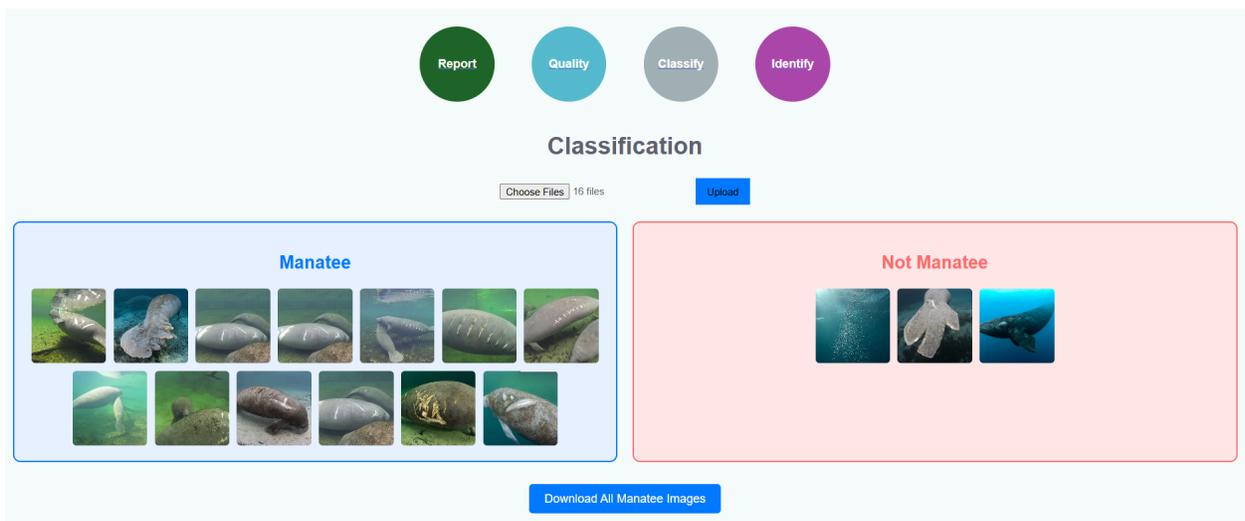
The users of the application will likely require images before they use it. The users may be those who go on missions, take photos or videos, and upload them, *or* may be different people. We will refer to the researchers and users as the two parties. The researchers refer to those who collect data, while users refer to those who process said data.

B. Step-By-Step



1. The Classification Page

The classification page has one primary purpose: to identify images containing manatees. Say if a researcher has a video and segments them into images, then the user can upload those images and have them separate the images of manatees and the images of others. The model has around a 76% success rate, so in cases where the model is incorrect, the user can click and drag the images to “reclassify” them.



Simply click the “Choose Files” button, choose the images you’d like to classify, and hit the blue “Upload” button. From there, click and drag the images as applicable.

Once all of the images are properly sorted according to the user's needs, the user can click “Download All Manatee Images” to collect all of the images in the blue “Manatee” category and receive them as a .zip file. The images here can be extracted and uploaded to the instance segmentation model if necessary.

2. The Water Quality Page

The water quality page highly depends on the type of water quality sensor you have. Currently, you can upload a CSV or Excel file, and the system will automatically give back the information. The application will average out dates and values as applicable. Click on the “Upload Files” button.

Water Quality Page

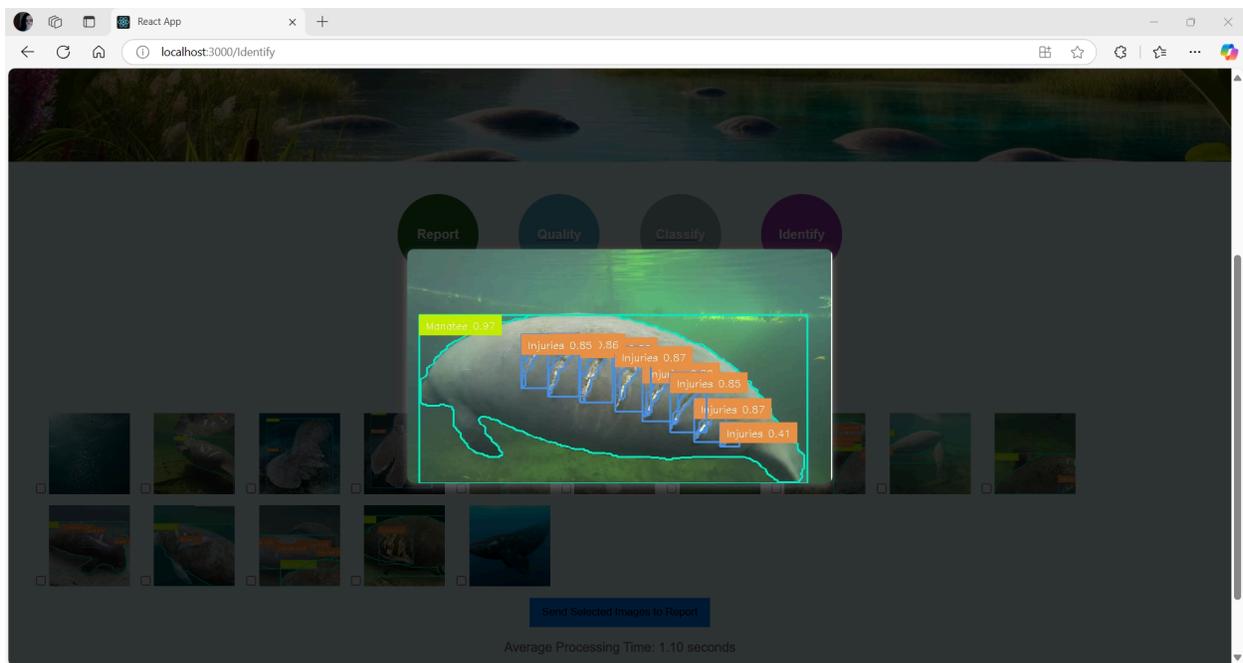
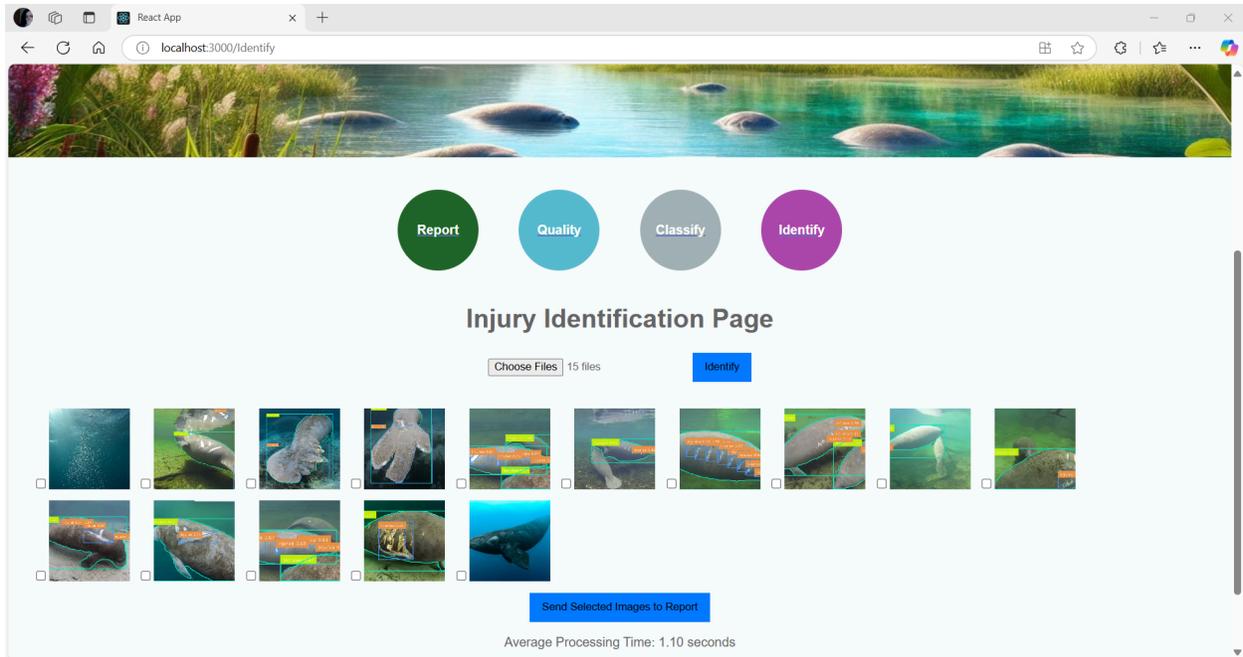
pHTest.xlsx
 Include in Report?
Meter Model: A211 pH
Serial Number: X01036
Software Revision: 3.04
User ID: ABC
Sample ID: SAMPLE

If you want to include it in the report, click the radio button labeled “Include in Report?”. This will send the information gathered by the .csv or .xlsx file to the report generation page.

3. The Identification Page

The identification page takes the most time. Like the classification page, the Identification page takes images of the manatees. Here, manatee photos will be analyzed for injuries, and the injuries will be highlighted. The model will give back small icons. Click on each icon to view it in a larger format.

Next to each image will be a small box. You can click these boxes, and a “checkmark” will appear. At the bottom of the page, if there are images you’ve checked, you can click the “Send Selected Images to Report” to have them included in the report page. This can be reviewed in the next section.



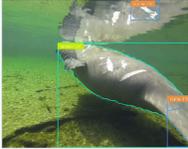
4. The Report Generation Page

The Report Generation page is the most customizable section of the application. Here you can write in the text box any information of your choosing to include in the report. A small icon of each image you previously chose can be seen at the bottom of the screen as a preview. Please note that the user is currently unable to enlarge these images specifically. They would have to go back to the identification page and re-upload the images to view them as such.

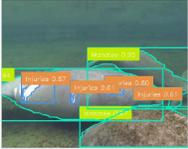
Each report includes the images and the text. You can export these together as either a PDF or a DOCX. Please note that the PDF is permanent and cannot be edited, but the DOCX can.

Report Generation Page

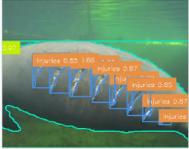
Write your report here...



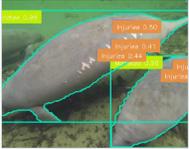
Write a caption...



Write a caption...



Write a caption...



Write a caption...

Water Quality Data

Meter Model	A211 pH
Serial Number	X01036
Software Revision	3.04
User ID	ABC
Sample ID	SAMPLE
Channel	CH-1

If you decide to include the water quality data, it'll appear in the bottom of the screen in a table. This is the format it'll download as well.

Each image has its own caption box in case you need to comment. You do not have to write anything if not needed, but they will appear underneath the images when downloaded.

IV. Troubleshooting & FAQs

Q: The application is not opening.

Go into the task manager and ensure nothing is running on Port 5000. If there is, the application will not properly execute.

If this does not work, please ensure you are trusting both ends.

If it is still not opening, and nothing is running under localhost:5000, ensure that your system is Windows 64-bit. The application will not run on any other operating system.

Q: The Classification page/Identification page does not classify the images.

Please ensure you're using a non-chrome browser. Then, restart the application.

Q: I cannot see the images in the report.

Ensure that the images are selected, and then the button is pressed to send them to the report.

V. Revisions

Date	Verison	Section	Description
04/11/2025	2	“Getting Started”	Batch files now operate the application. No installation of Python or user commands from the command prompt is necessary.
...	...	“The Classification Page”	A button to download all sorted manatee images has been added. The example image was updated, along with a short explanation of the operation.
...	...	“The Water Quality Page”	The page now features an “Include In Report” radio button. An updated example image along with a description has been added.
...	...	“The Report Generation Page”	Captions and the inclusion of the water quality data has been added.