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About

Health terminal is an open source modifiable, module style framework for predicting patient risk and providing a platform for machine learning about patient data created as a master thesis see legal notice for more info about use.

Requirements

Health terminal is designed for windows and was been tested on windows however the terminal itself could be ported to linux by changing node dependencies this has not been tested or done but is possible.

Most of the required libraries are included in the windows installer however mysql is required and will have to be installed and set up on its own.

Mysql can be acquired here www.mysql.com please install before proceeding as mysql is required for databasing

Getting started

One work bench is installed you can download the installer for the health terminal from

<https://cold1.gofile.io/download/direct/f8a637da-fdb8-4bcf-b63d-5d8288565dac/healthterminalinstaller.zip>

Simply unzip and install windows defender may have issues with it so keep that in mind when attempting to extract or install.

After installation is complete navigate to the installed directory by default it is

C:\Program Files (x86)\HealthTerminal\Installer\HealthTerminal
Run or load Initialdatabase.sql into the mysql their is a bat file that should automatically do this however you must use your own database user name and password that you will have set up during the installation of mysql.

You can also just run

```
"C:\Program Files\MySQL\MySQL Workbench 8.0\mysql" -u root -p healthterminal < Initialdatabase.sql  
"Path to my sql" -u root -p database_name < path\Initialdatabase.sql
```

The software will now be ready to use the default logging is test test and the database will contain some testing data.

Accessing the software

You can access the software by typing <http://localhost:1222/> into any web browser on the local device or by looking up the local area network ip for the device which can be found by running The cmd command ip config on windows

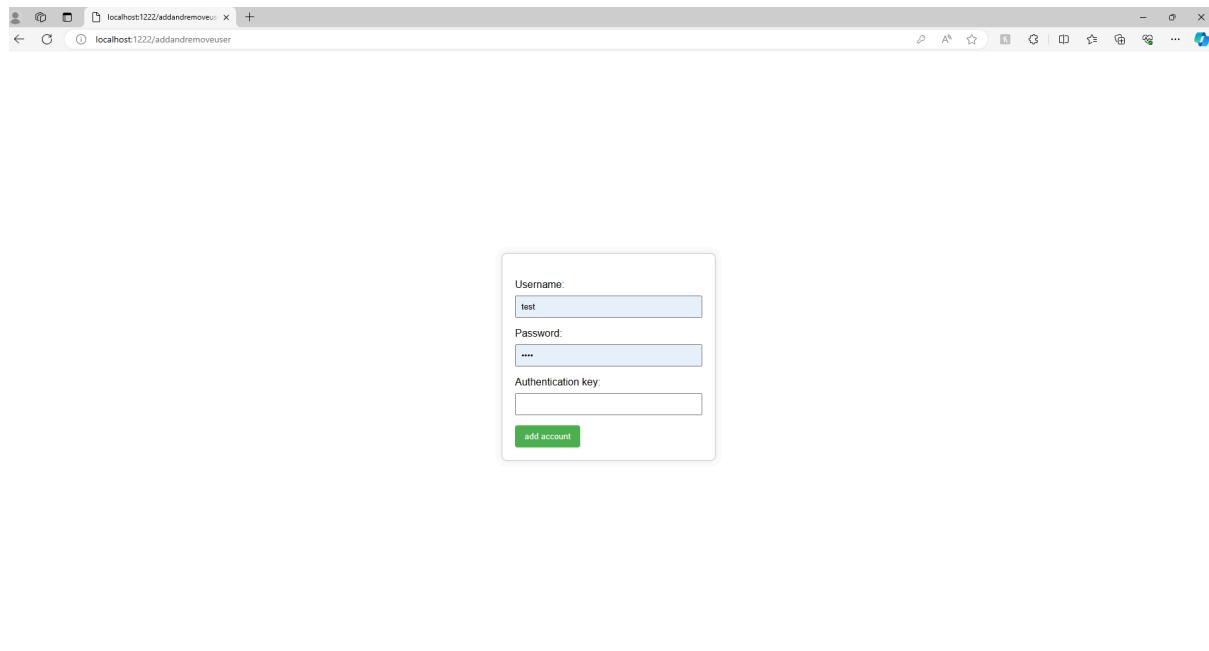
From any device on the local network you can search ip:1222 and load the software this includes phones and other devices

After loading the url you will have to login the base logging is user(test) pass(test)

Adding accounts

In the top right hand corner of the screen you can select add or remove account once there you can simply put in a new username and password along with a key

The key is used by the administrator to stop any unauthorised account creation the first key used will permanently be added to the database; this key must be used for all future accounts and can only be changed directly through the database.



A screenshot of a web browser window titled "localhost:1222/addandremoveuser". The page displays a form for adding a new account. The form fields are:

- Username:
- Password:
- Authentication key:
-

Adding patients

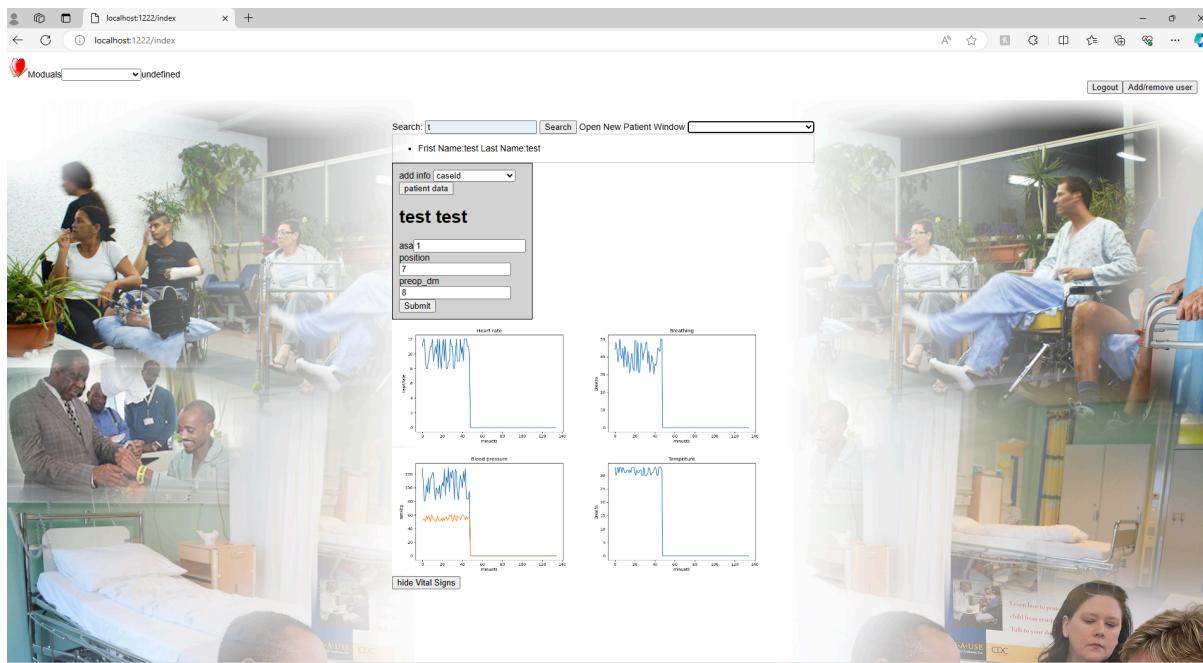
Patients can be added using the add patients module here you can add application via name and last name before setting default parameters for patients settings



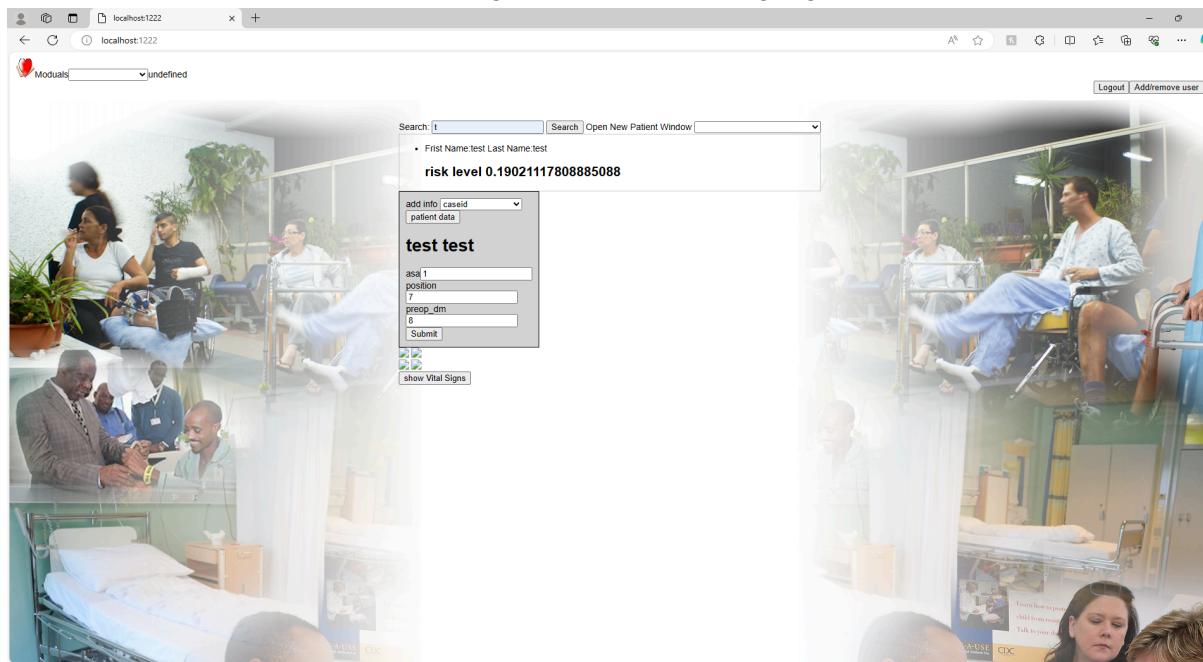
Patient monitoring

On the left hand side of the screens is the module selecting patient monitoring will open up this module in this module allows searching and viewing of patient data and video feeds you can search for the patient in the search bar and select from the patients found doing this will bring up the patients data and add it to the viewing list

From this screen you can view the patients vital signs, input and read patients data provided by users and read any warnings about the patients health for example if the patients blood pressure drops below normal range a warning will appear on this screen



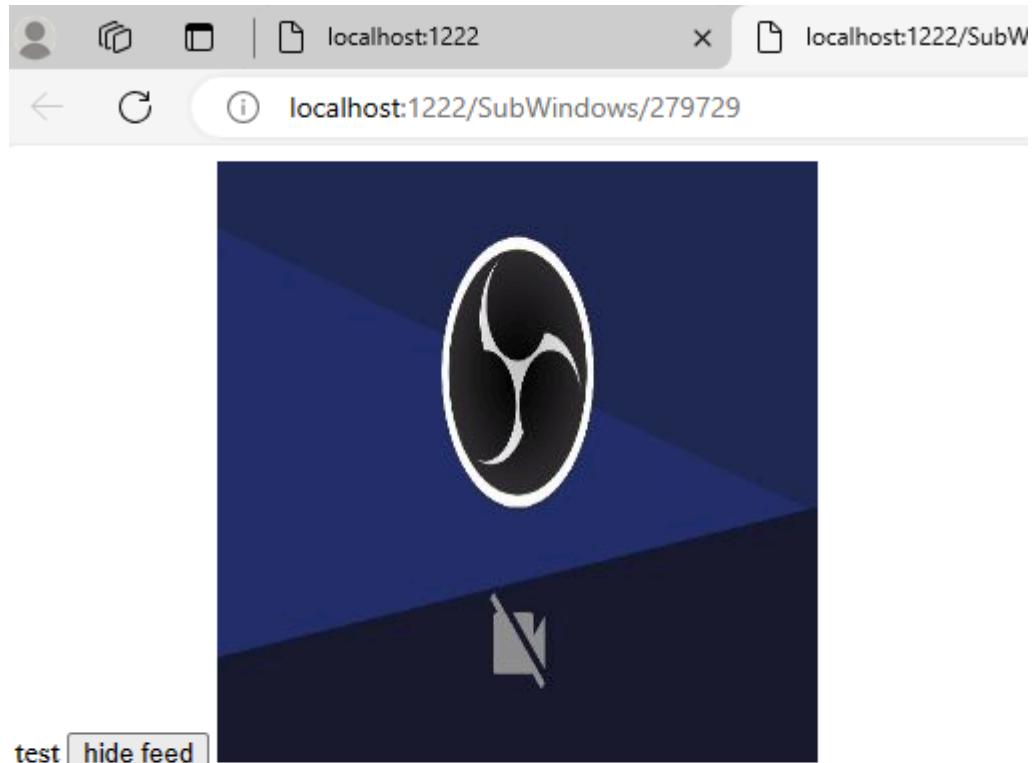
This screen will also provide a risk rating based on the patients data after it has been submitted at least once this will appear at the top of the page under the patient name and will be a number between 0 and 1, 0 being low risk and 1 being high risk.



Risk is determined based on learning algorithms and the current patients data and is meant to be a general guideline for risk of death.

On the top of this page their is a patient drop down allowing for the viewing of live feeds of the patient, this will appear in a new screen when the patient name is selected and in this new screen it will contain a live feed and a predicted risk based on camera data and a learning algorithm, while this screen is active samples will be taken and compared with predicted risk to create more data sets which can then be used later for rebuilding the

learning algorithm and refining it for better predictions.



Risk Rating 0.8

Software settings

This module contains general setting such as vital signs ranges for all patients or by selecting patient specifics vital sign ranges for a specific patient can be set, also on the screen a

specific patients camera can be set by inputting the camera number it will default on 0.

The screenshots show a web-based configuration interface for medical equipment. The top screenshot displays a form titled "set defult vital signs warning range" with the following parameter settings:

Blood Pressure systolic max	6
Blood Pressure systolic min	6
Blood Pressure Dist max	6
Blood Pressure Dist min	6
Temp max	6
Temp min	6
Breaths per minut min	6
Breaths per minut max	6

A "patient camara number" field contains the value 0, and a "Submit" button is present at the bottom.

The bottom screenshot shows a search interface with a "Search Patient" input field containing "test test" and a "Search" button. To its right is the same "set defult vital signs warning range" form with the same parameter settings as the top screenshot.

In this module you will also find the learning target render ports. This setting will allow you to add modules between the start and end of the prediction process so that you may specialise and refine learning algorithms with your own methods more about this in the advanced section.



Advanced

Modifying main terminal code

The main terminal code is open source and can be modified at any time changes will take effect on the restart of the software although if the changes occur in the html files it is not necessary to restart the software reloading the page will work.

Modifying the python scripts

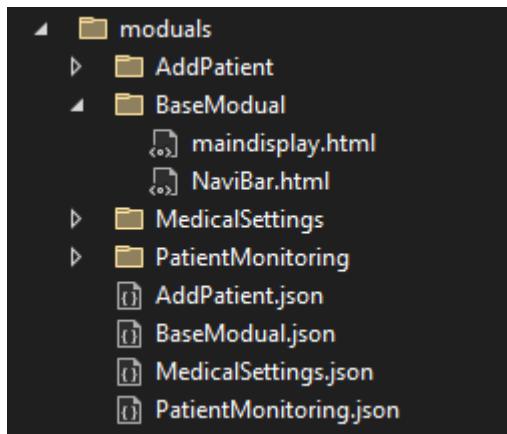
Python scripts can be modified in the python folder after modification building with pyinstaller and copying and pasting the exe and interlans folder to the main directory will update it the program must me restarted after this to work properly.

Rebuilding compression and encryption

The software uses a hot key encryption system where commonly found strings in the data are extracted and linked to a hotkey to compress the data. This is built from the logs it is already built but it is recommended that after running the software for a few weeks it be rebuilt. This will change the hotkeys and make them unique to your specific version so that no two terminals have the same encryption and compression system. This is done by running `rebuildcodex(loginFileName)` in `compressionandencryption.js`. It's recommended that you only do this once or twice not every time you start up as it is a slow process.

Adding modules

Modules can be added by duplicating the base module in the `modules` folder and renaming it. This can then be used to create a new module with new functionality.



Adding outside data sources

Viral signs and other data can be updated via URL POST calls. The various methods used to do this are located in the source as examples and test cases.