EyeVib

Software Manual

Insights to Vibration Monitoring

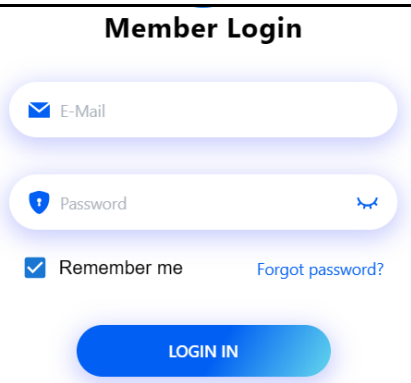
DEVELOPED BY:

Centre of Excellence in Advanced Manufacturing Technology

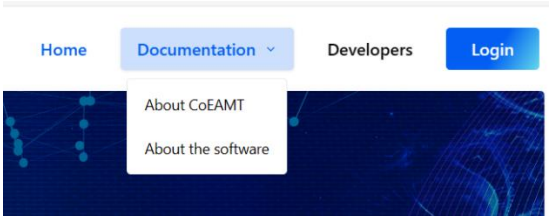
IIT Kharagpur

1. Landing page

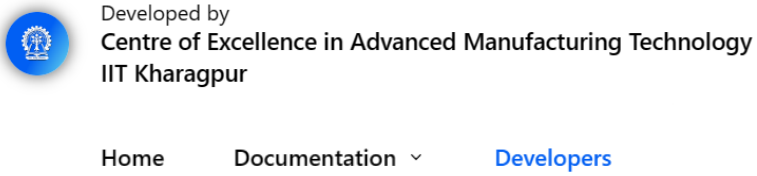
User can login to the dashboard by clicking on "**Login**" or "**Enter Dashboard**" button.



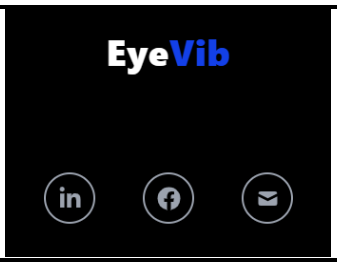
"**Documentation**" provides more details about the Centre of Excellence in Advanced Manufacturing Technology (CoEAMT), and the software: EyeVib.



"**Developers**" of EyeVib



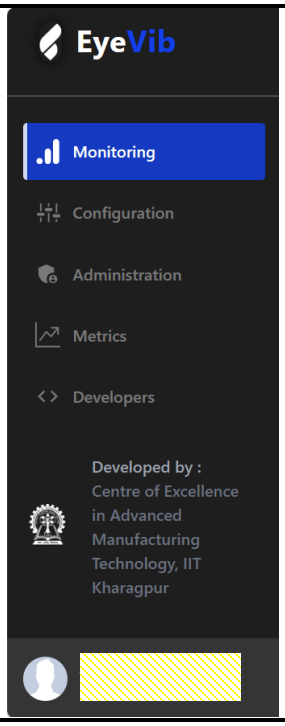
"**Connect**" with us.



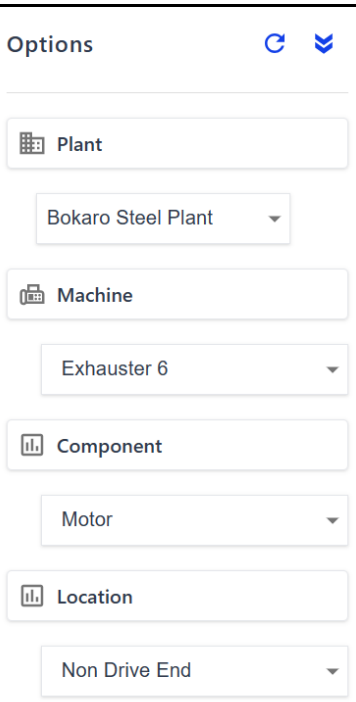
2. Monitoring page

Collapsible "**Navigation bar**" for navigating to other tabs, such as

- Configuration
- Administration
- Metrics
- Developers



Collapsible "**Options**" window, for selection of assets.



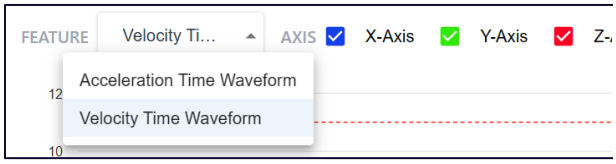
- **Plant**: Bokaro Steel Plant
- **Machine**: Exhauster 1 to 6
- **Component**: Motor, Fan
- **Location**: Drive end, Non drive end

- After selection of desired asset, click on "**Fetch**" button.

- "**Collapse**" the "**Options**" window.

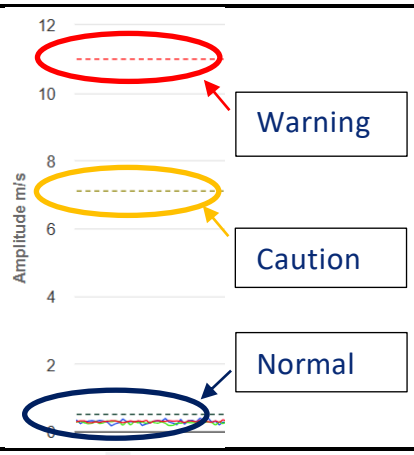
"**Time Waveform Data**" shows real-time acceleration and velocities along X, Y and Z axis.

- Past or "**History**" data can be seen by selecting desired time period, followed by pressing the "**Fetch**" button.

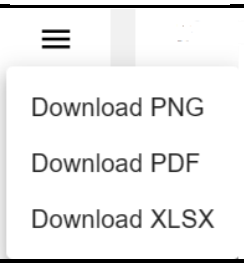


- Menu to toggle between Velocity/Acceleration data, and select/deselect of axis.

- Enable/disable threshold markers in velocity time-waveform plot.

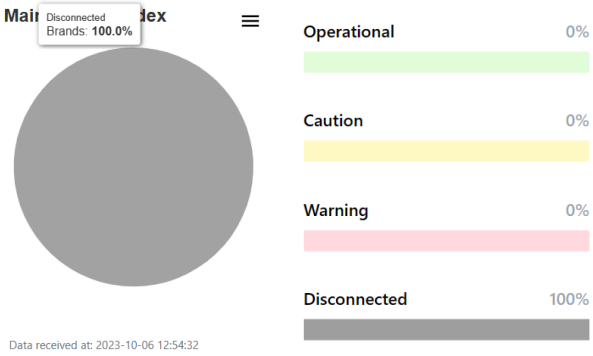


Data "**export**" in PNG, PDF or XLSX format.



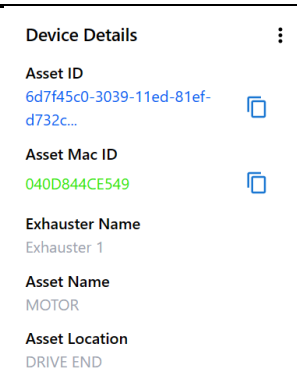
"**Maintenance Index**" shows the running condition of the selected asset.

- **Operational**: Fraction of datapoints received on current day (24 hours) compared to data frequency at fully operational condition.
- **Caution**: Fraction of data points crossed Caution limit
- **Warning**: Fraction of data points crossed Warning limit
- **Disconnected**: (1 – operational)



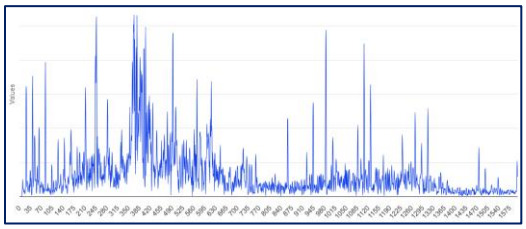
"**Device Details**" window provides information about:

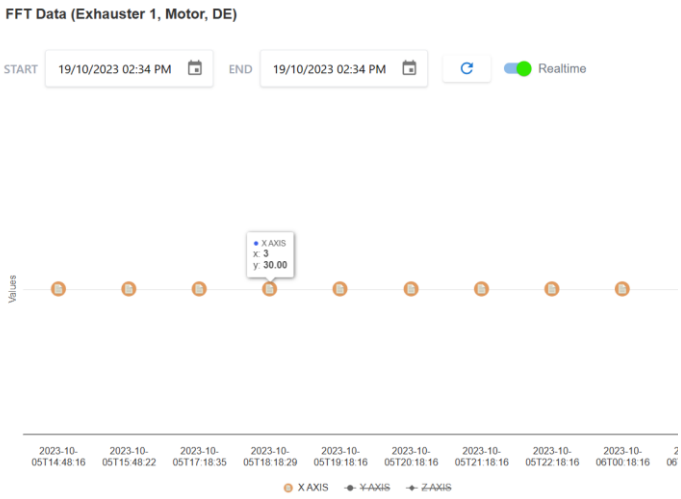
- "**Asset ID**" of selected asset
- "**Mac ID**" if selected asset
- "**Name**" of the selected machine, component, and location



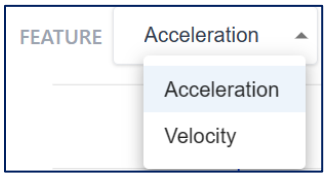
Each  icon in "**FFT Data**" plot shows the timestamp of receiving FFT data in MongoDB database.

- Pressing any  icon will show the corresponding FFT data plot.





- Option for selecting Velocity/Acceleration FFT.

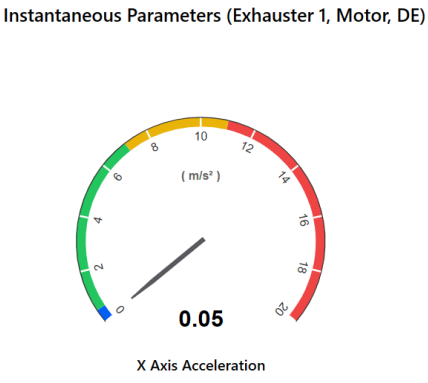


- Enable/Disable option for axis.

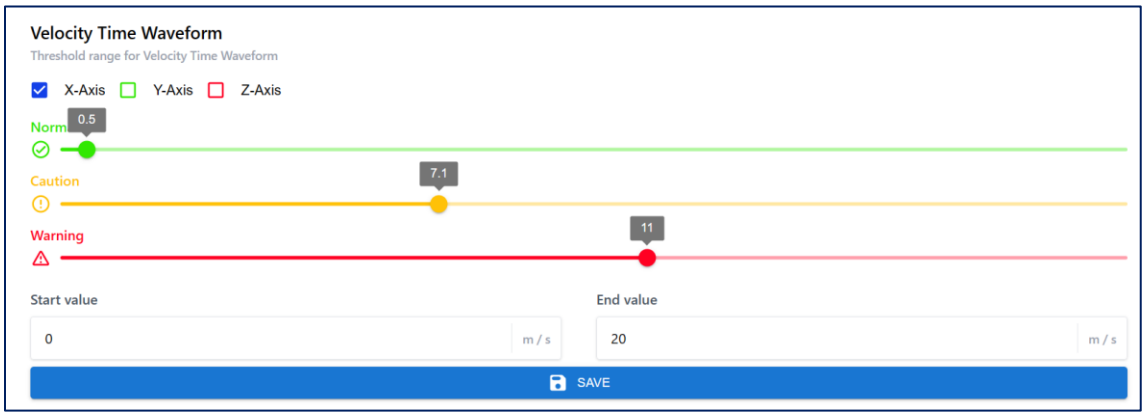
"**Instantaneous Parameters**" shows the RMS values obtained from latest data stored in MongoDB database.

- Acceleration RMS
  - X-axis
  - Y-axis
  - Z-axis
- Velocity RMS
  - X-axis
  - Y-axis
  - Z-axis
- Colour code:

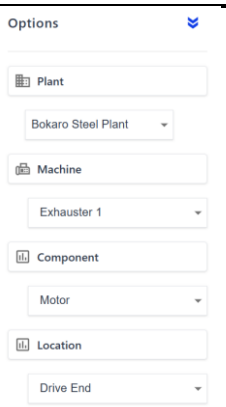
Normal range
Healthy range
Caution range
Warning range

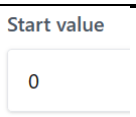
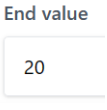


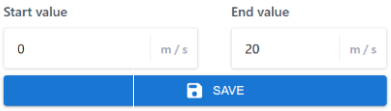
3. Configuration page



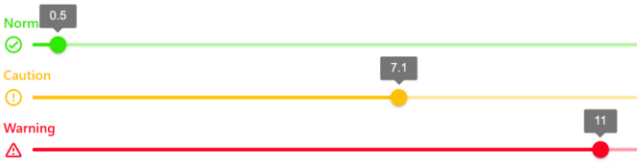
Selection of asset from "**Options**" window.



Set "**Start Value**"  and "**End Value**"  for the range of threshold, and press  button.

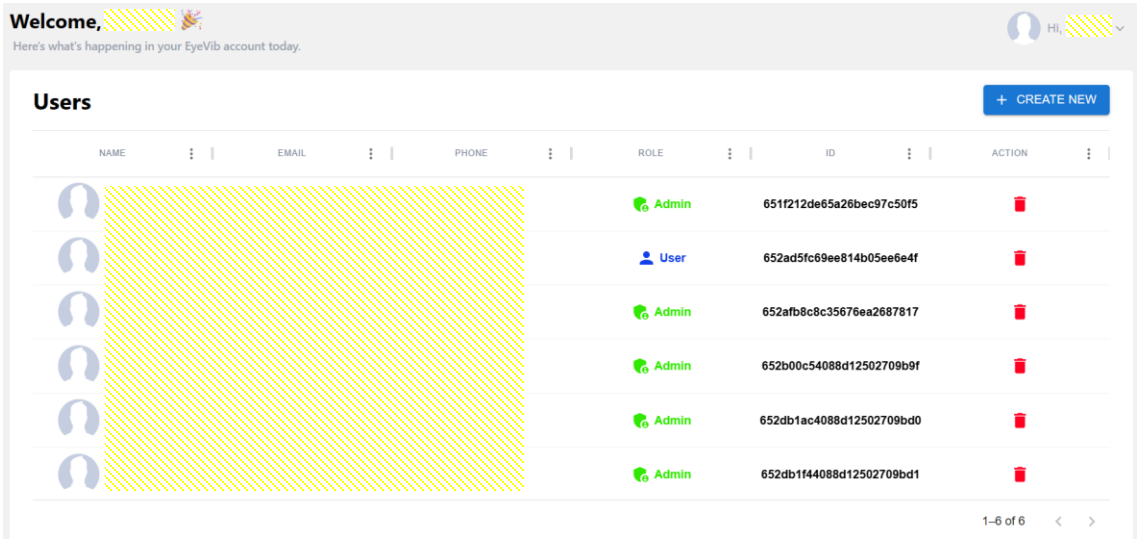


Move the "**Slider**"  button for changing the set threshold.



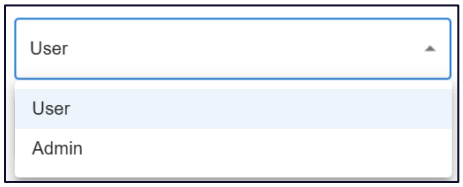
- Select axis for which the threshold needs to be changed.

4. Administration page

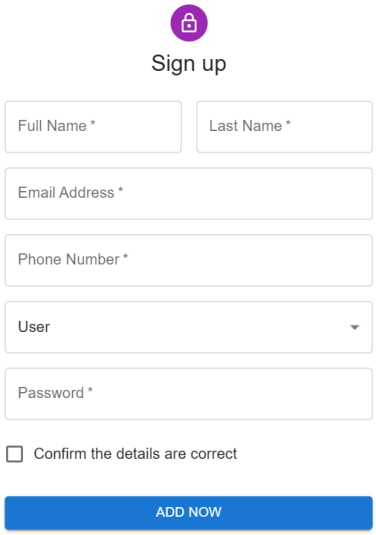


"**Sign up**" for creating new user.

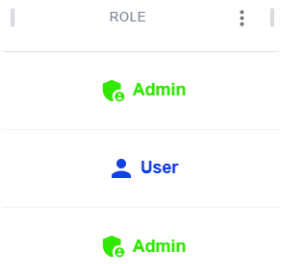
- Assign as "**User**" or "**Admin**"

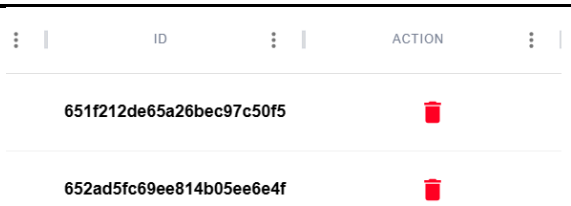
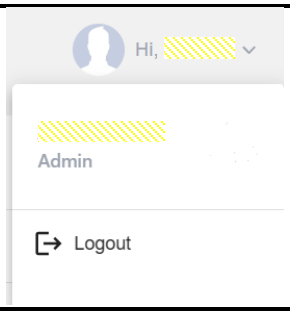


- Additional rights of "**Admin**"
  - Add/delete user
  - Change threshold values
  - Receive e-mail for "**Daily summary report**"

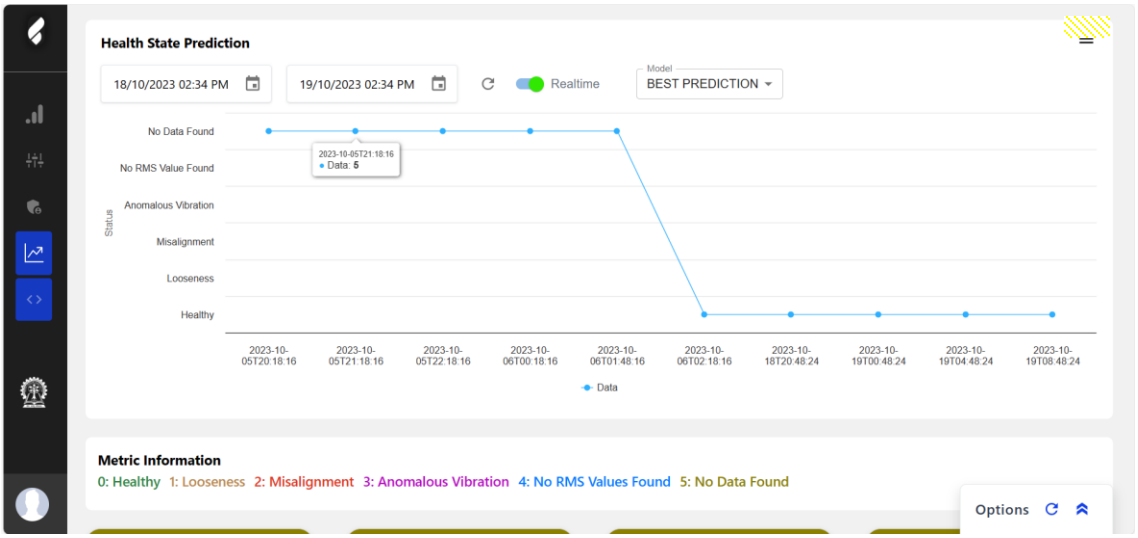


Role of a member will be shown as "**Admin**" Admin or "**User**" User

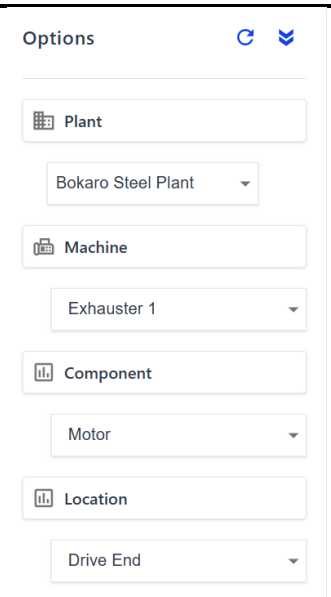


“**ID**” of the member. Delete a member using the “**Action**” button.	
“**Logout**” button to sign off the dashboard.	

5. Metrics page

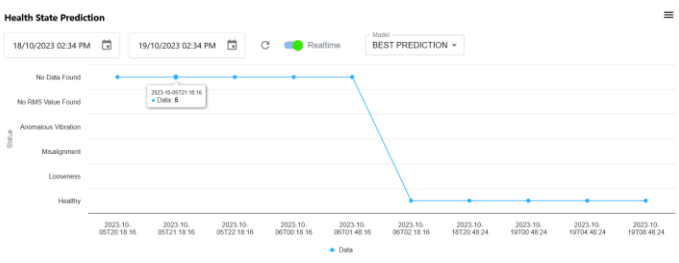


Selection of asset from the "**Options**" window, and press the "**Fetch**"  icon.



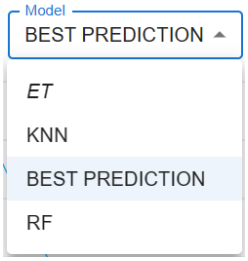
"**Health State Predictions**" shows the real-time predicted state for the selected asset.

- History of predicted states can be visualized by selecting desired time period.



Selection of Machine Learning models:

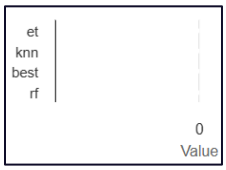
- **ET**: Extra Trees
- **KNN**: K-Nearest Neighbour
- **RF**: Random Forest
- **Best prediction**: Based on the highest voting of above three ML models (**RECOMMENDED**)



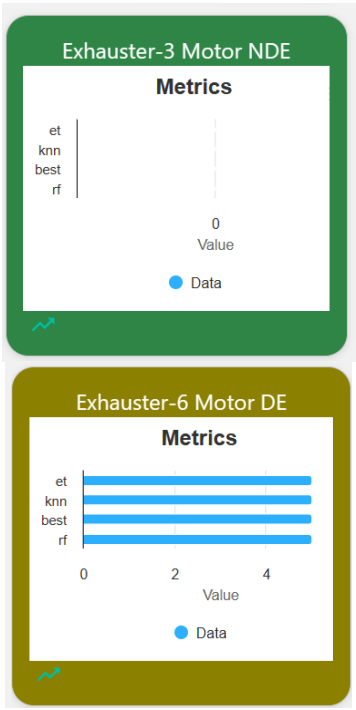
"**Metric Information**" shows the colour codes used to represent different predicted health states.

According to the colour codes mentioned, a "**Healthy**" asset shows coloured window as per the latest prediction.

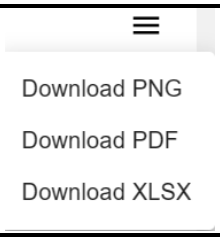
- Predicted health states are plotted with bar chart:



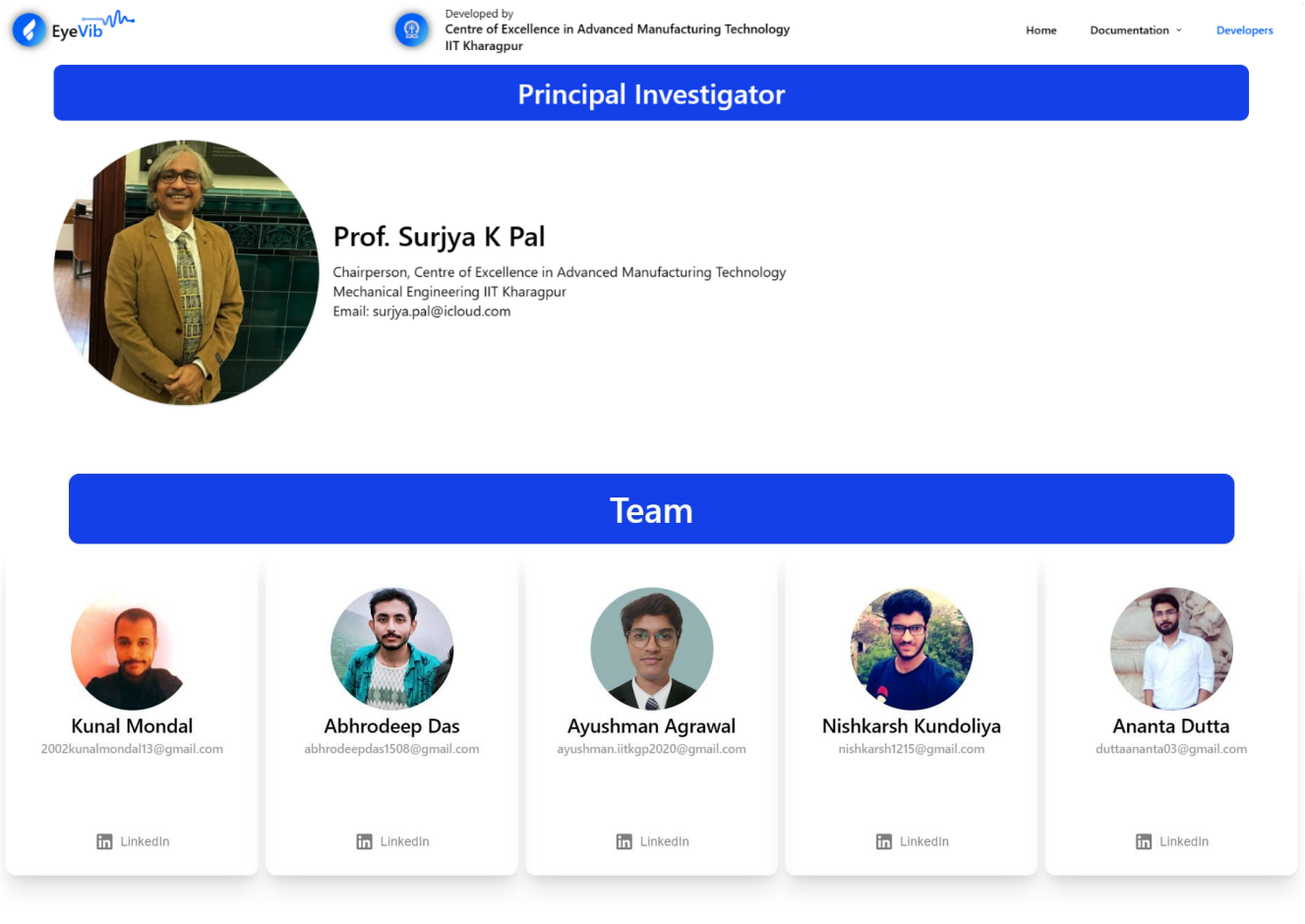
  - 0: Healthy
  - 1: Looseness
  - 2: Misalignment
  - 3: Anomalous Vibration
  - 4: No RMS Values Found
  - 5: No Data Found



The predicted results for selected asset can be exported as PNG, PDF or XLSX format.



6. Developers page



Acknowledgement

"…Centre of Excellence in Advanced Manufacturing Technology (CoEAMT) is immensely grateful for the invaluable support provided by Research & Development Centre for Iron & Steel (RDCIS)-SAIL, encompassing essential data provisioning, MongoDB database accessibility, and valuable insights that have been instrumental in the advancement of our software development initiatives. Your collaboration has been pivotal to the success of EyeVib…"



***IITKGP-RDCIS MoA*, signed on 12th October 2022**