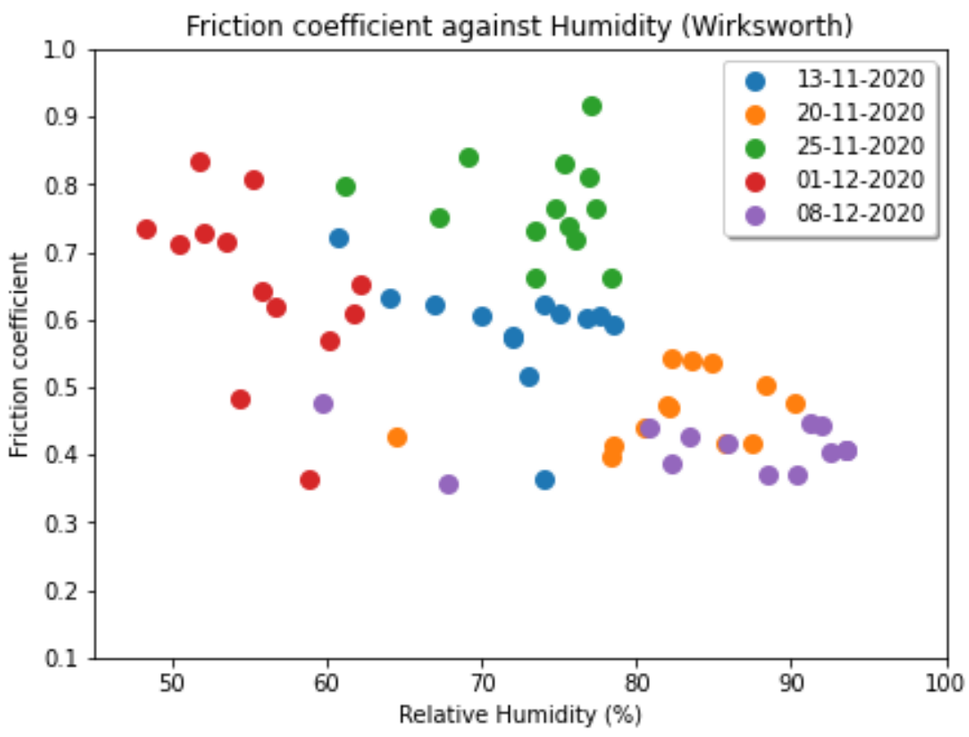
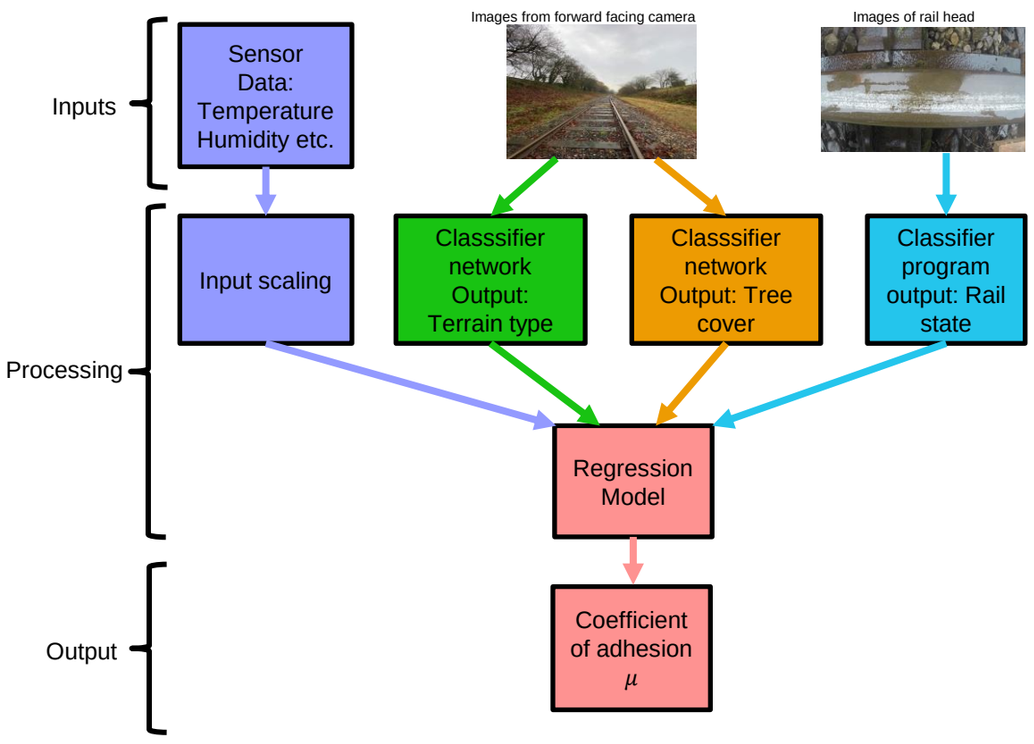
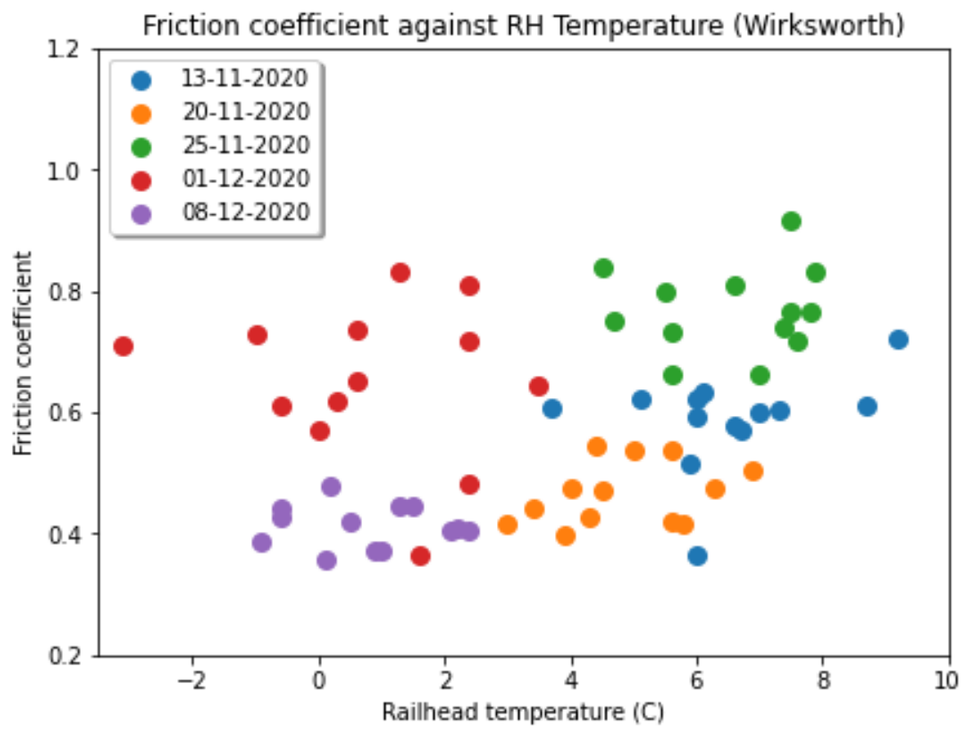
Improving Prediction of Low Adhesion Friction Considering Transience

RSSB funded project to improve the understanding of wheel/rail interface low adhesion friction in transience and use it to improve adhesion forecasting and validation of a machine learning approach (using neural networks (NNs)) for friction estimation.



Analysis of the rail head conditions using pendulum tester and infrared thermometer at Ecclesbourne Valley Railway, EVR (Wirksworth station) in autumn 2020 to assess levels of contamination and friction levels.





Validation of the neural network tool has begun using railhead images, track surrounding images and data obtained from the railhead analysis

Railhead image from EVR (Wirksworth station)

Next steps:

- Obtain additional railhead measurements using pendulum tester and On-trak tribometer and track surrounding information for the Neural Network (NN) tool validation.
  - NN tool will be validated using existing and soon to be collected site data.
  - Ensure NN tool is user friendly.
- Recreate low adhesion states in the laboratory or in the field to improve the robustness of the NN tool, depicting different possible scenarios experienced on track by drivers.
- Design a sensor pack for use in conjunction with the NN tool on an actual train to better understand how the tool performs in real-life scenarios and trial it on:
  - a full scale rail rig at low speed
  - a full scale rail rig at high speed
  - an actual train in operation

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