

Supplementary File: Neural Networks Detect Inter-Turn Short Circuit Faults Using Inverter Switching Statistics

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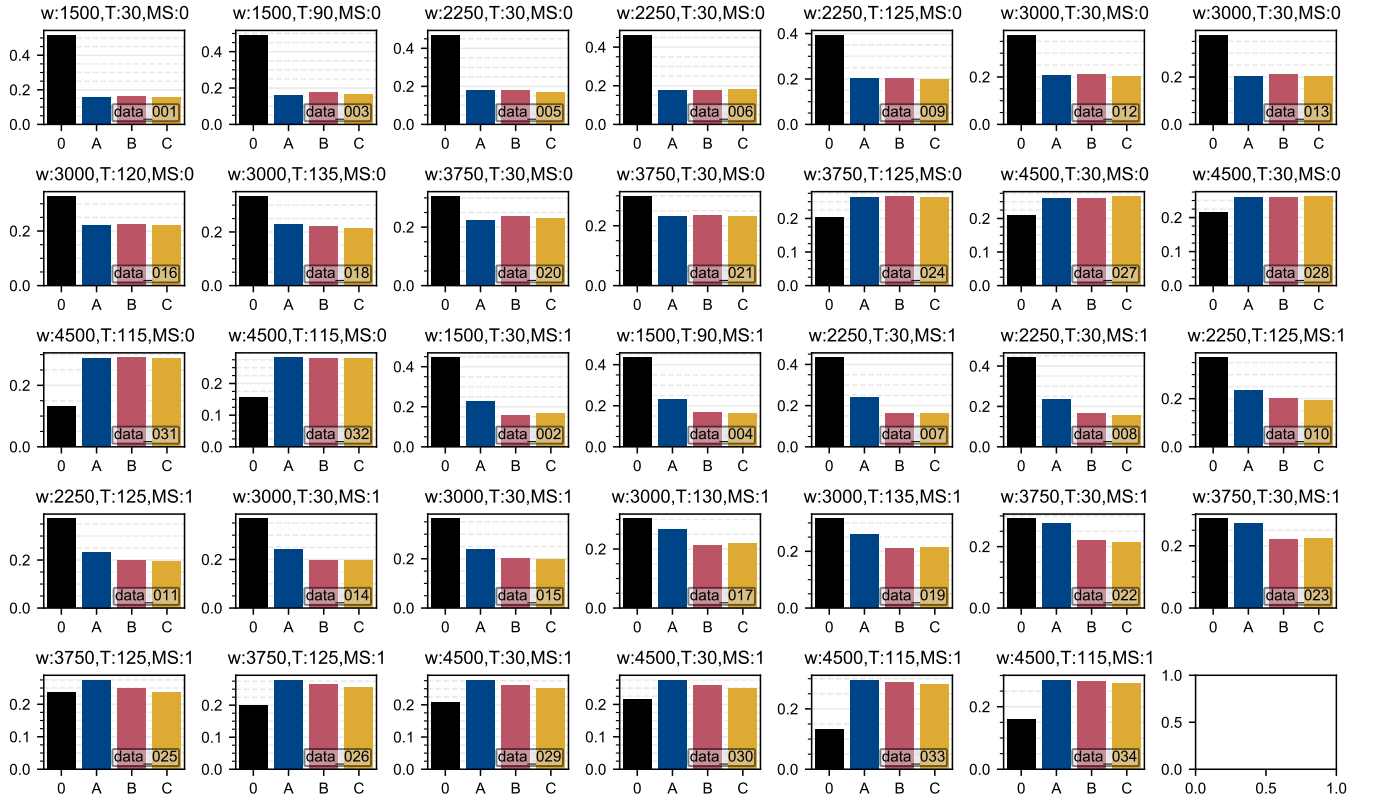


Fig. S1: **Histograms of switching vectors in data series used to create the samples in the training set.** While aggregated 0-vectors is represented as 0, aggregated active vectors are represented as A, B and C. For each data series, id, speed (rpm), torque (N·m), and MS ((H)ealthy, (F)aulty) are also given.

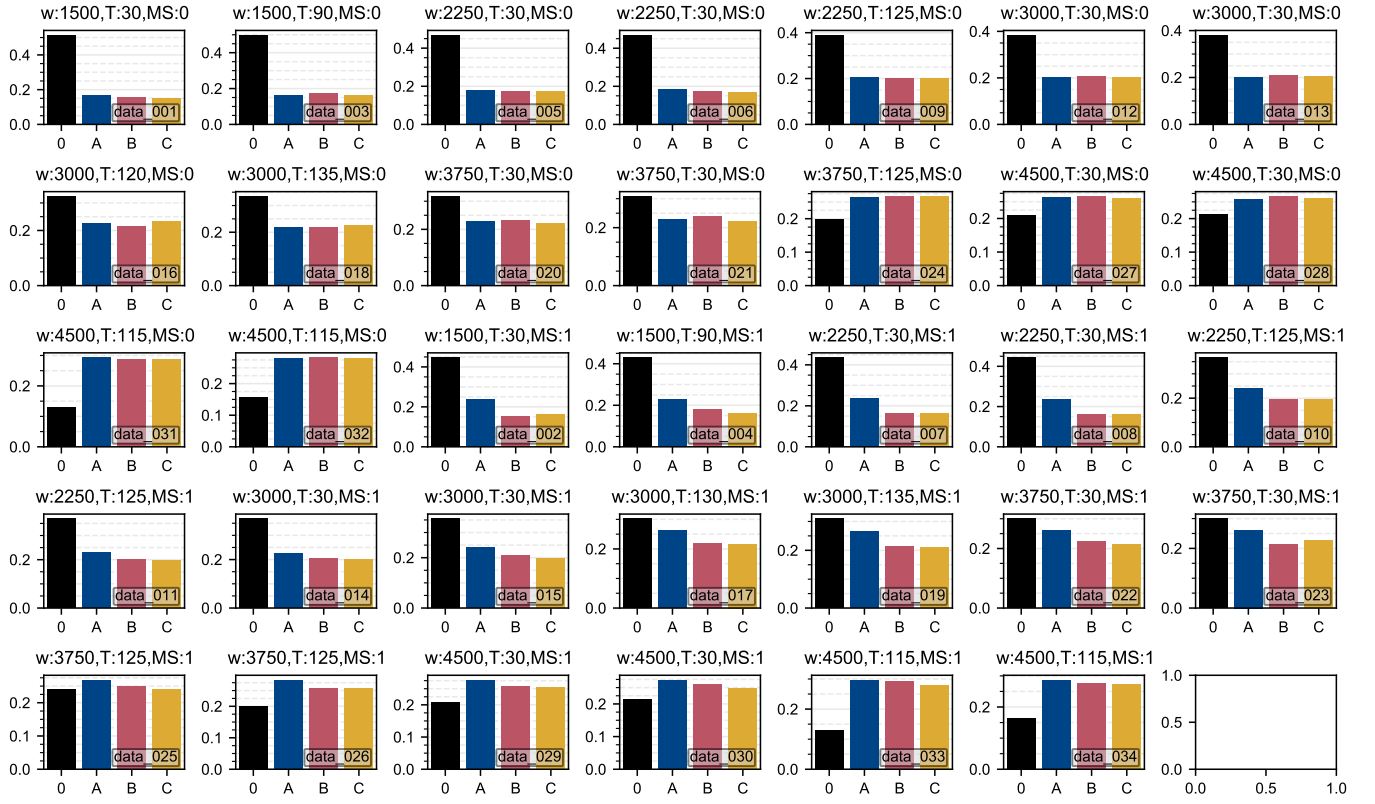


Fig. S2: **Histograms of switching vectors in data series used to create the samples in the validation set.** While aggregated 0-vectors is represented as 0, aggregated active vectors are represented as A, B and C. For each data series, id, speed (rpm), torque (N·m), and MS ((H)ealthy, (F)aulty) are also given.

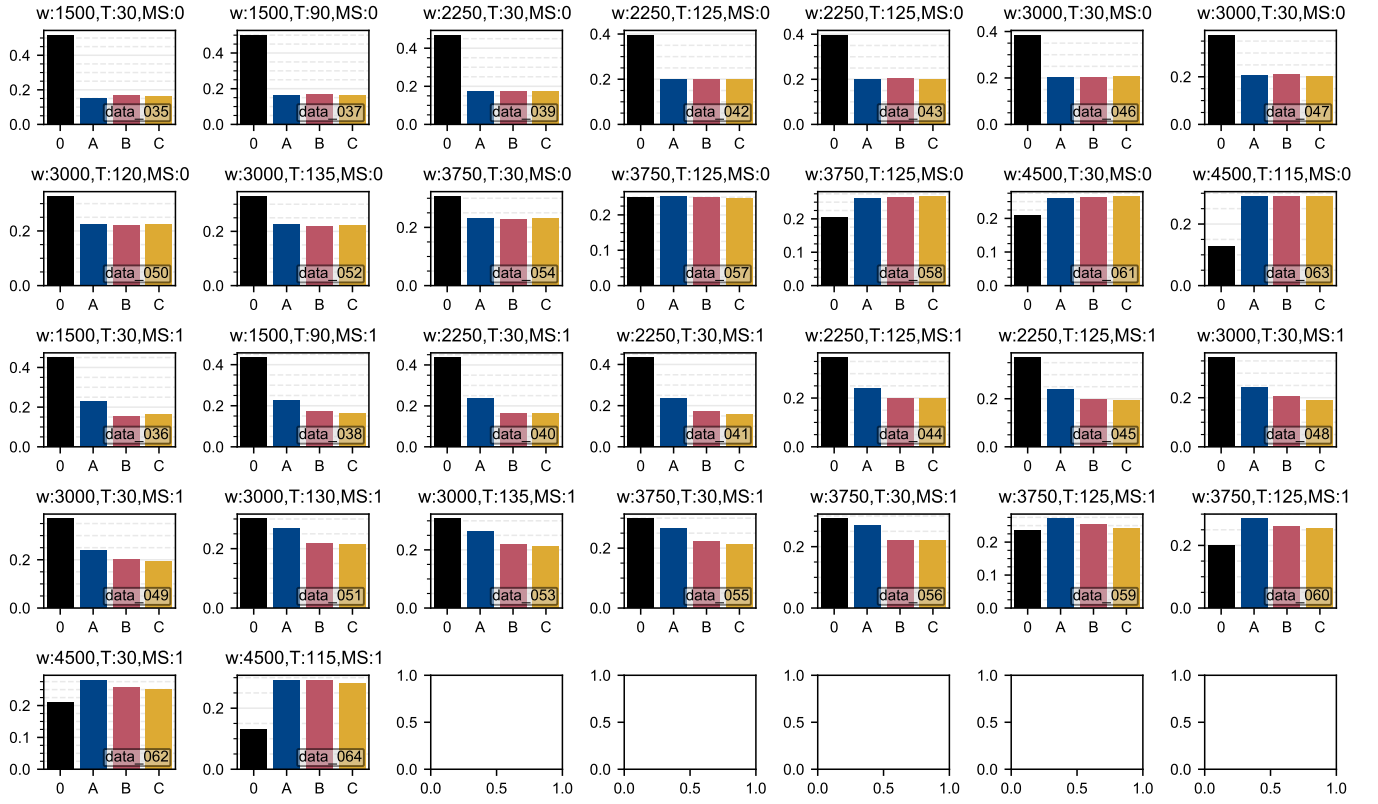


Fig. S3: **Histograms of switching vectors in data series used to create the samples in the test set.** While aggregated 0-vectors is represented as 0, aggregated active vectors are represented as A, B and C. For each data series, id, speed (rpm), torque (N·m), and MS ((H)ealthy, (F)aulty) are also given.

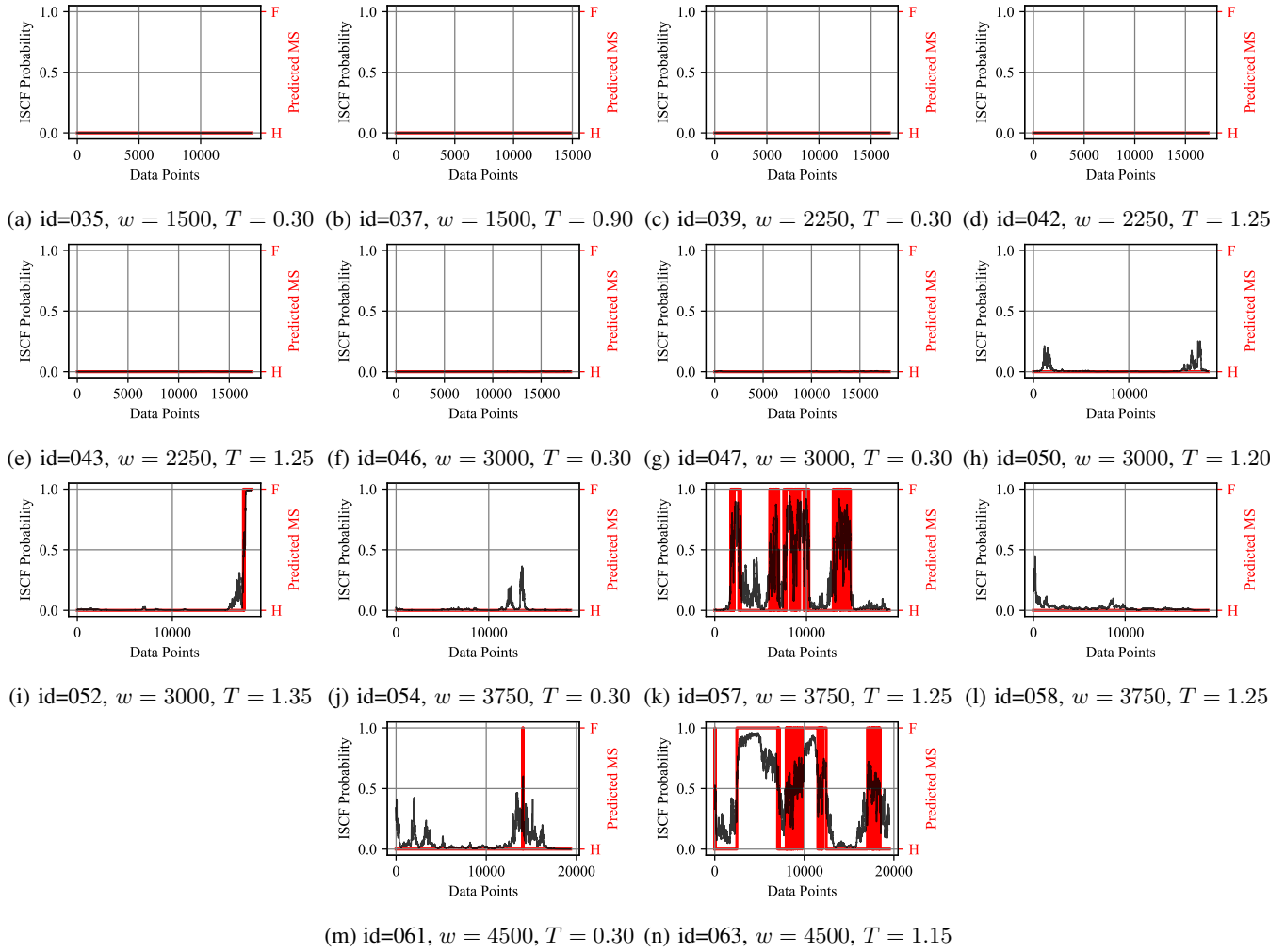


Fig. S4: Machine status predictions on the data series in the test set, collected from a healthy machine. At each point of a data series, inter-turn short circuit fault (ISCF) probability was obtained from the trained model. ISCF probability and predicted machine status (MS) obtained by thresholding the predicted probability value with 0.5 are presented for each data series. For each data series, id, speed (rpm), and torque (N·m) are also given. Note that the machine's rated specifications are $w = 3000$ rpm and $T = 1.20$ N·m.

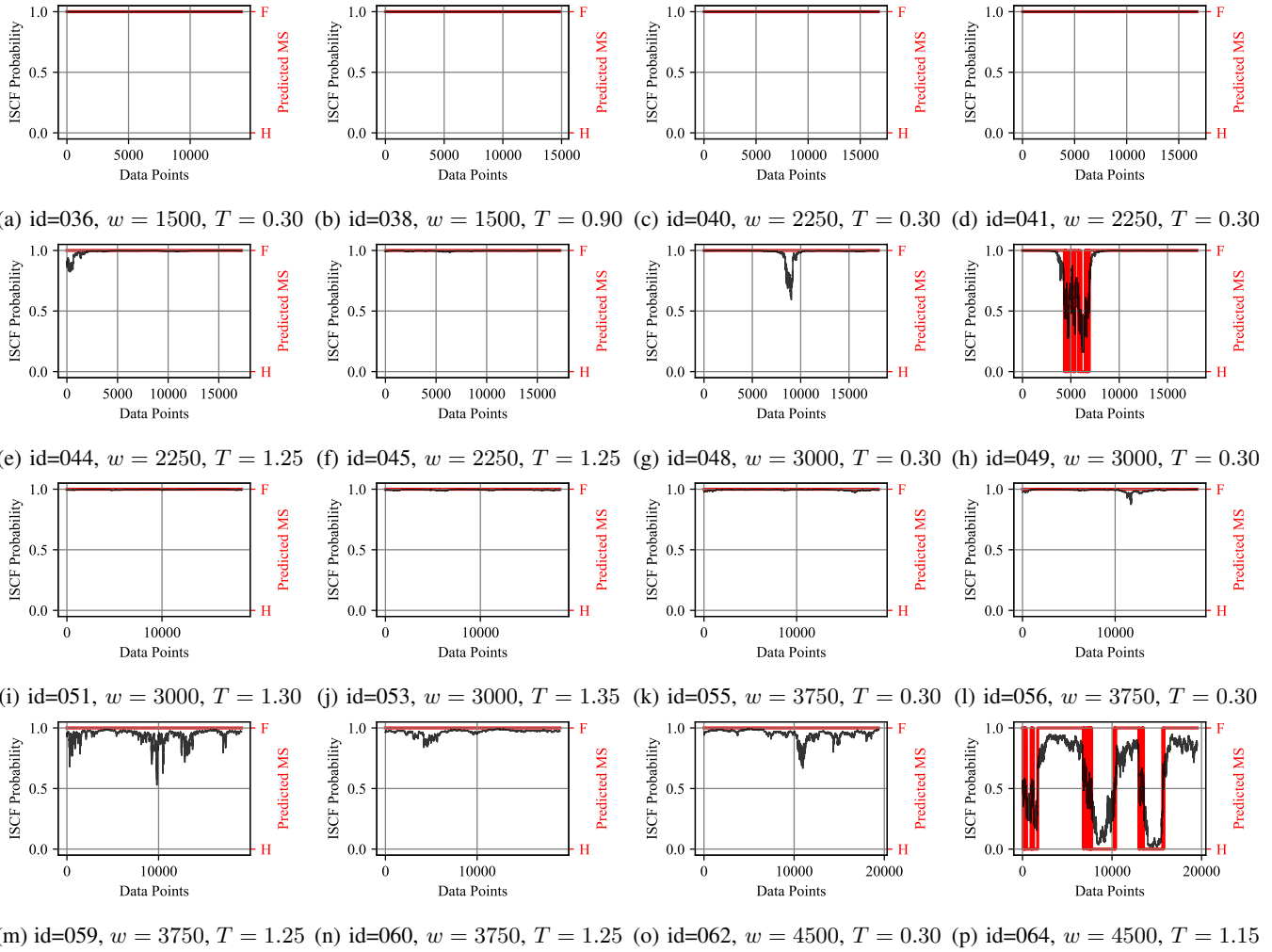


Fig. S5: Machine status predictions on the data series in the test set, collected from a faulty machine. At each point of a data series, inter-turn short circuit fault (ISCF) probability was obtained from the trained model. ISCF probability and predicted machine status (MS) obtained by thresholding the predicted probability value with 0.5 are presented for each data series. For each data series, id, speed (rpm), and torque (N·m) are also given. Note that the machine's rated specifications are $w = 3000$ rpm and $T = 1.20$ N·m.