



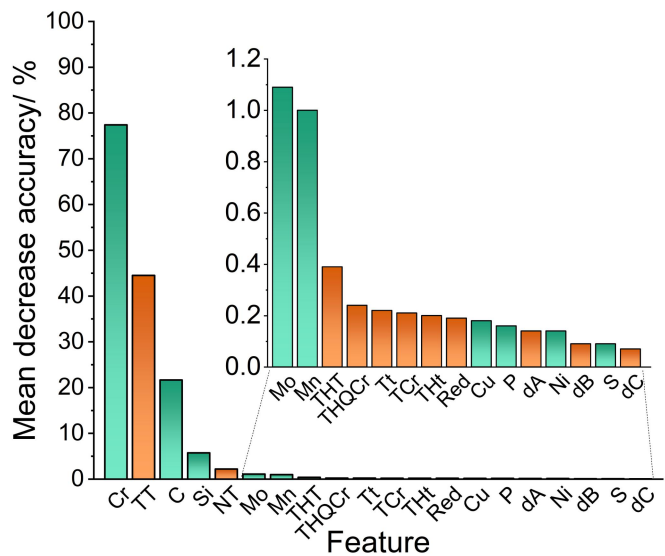
Supplementary Material: High cycle fatigue S-N curve prediction of steels based on transfer learning guided convolutional neural network

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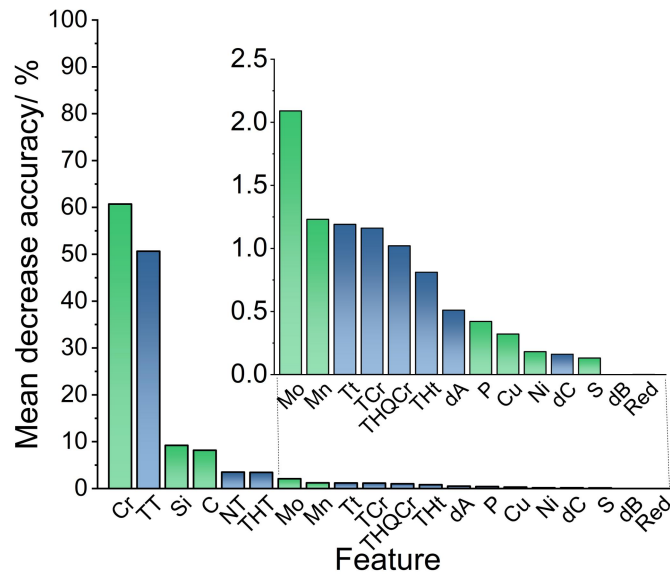
Supplementary Figure 1. Mean decrease accuracy (MDA, represents the importance of features on the property prediction) results of features in the rotating bending dataset used.



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**Supplementary Figure 2.** Mean decrease accuracy (MDA, represents the importance of features on the property prediction) results of features in the reversed torsion dataset used.

**Supplementary Table 1. Non-TR-CNN model performance at different model parameter settings.**

Model settings	MAE/ MPa		
	Training set	Testing set	Validation set
Basic model			
(Convolution: 5×5×32, 5×5×64; Full connection: 128, 64; Dropout: 0.4)	2.58 ± 0.65	38.23 ± 22.75	41.76 ± 10.97
Dropout: 0.1	1.23 ± 0.20	38.39 ± 22.49	42.15 ± 12.92
Dropout: 0.2	1.80 ± 0.52	40.40 ± 29.87	43.17 ± 12.87
Dropout: 0.3	1.92 ± 0.42	36.92 ± 19.52	40.43 ± 11.09
Dropout: 0.5	2.84 ± 0.67	36.06 ± 20.07	40.54 ± 10.84
Convolution: 5×5×64	2.54 ± 0.50	40.76 ± 30.03	41.70 ± 11.59
Convolution: 5×5×4, 5×5×8	2.26 ± 0.50	37.11 ± 17.75	41.72 ± 8.87
Convolution: 5×5×8, 5×5×16	2.25 ± 0.50	35.96 ± 12.39	42.36 ± 8.94
Convolution: 5×5×16, 5×5×32	2.25 ± 0.35	35.92 ± 15.01	40.75 ± 8.72
Convolution: 5×5×16, 5×5×32, 5×5×64	2.34 ± 0.39	40.50 ± 24.98	40.62 ± 9.52
Full connection: 64	3.65 ± 0.77	36.84 ± 20.65	41.20 ± 11.15
Full connection: 256	1.69 ± 0.36	36.29 ± 21.16	39.82 ± 10.20
Full connection: 512	1.47 ± 0.29	36.95 ± 21.91	41.16 ± 9.77
Fully connection: 128, 128, 64	3.60 ± 0.55	36.03 ± 20.11	42.07 ± 13.02