materials

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Supplementary Materials:

Precise Correlation of Contact Area and Forces in the Unstable Friction between A Rough Fluoroelastomer Surface and Borosilicate Glass

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S1. Details of CNN Training for Contact Area Portioning

The CNN takes as input greyscale images resized to 240 × 240 pixels and outputs a two-dimensional vector corresponding to the relative x- and y- coordinates of the predicted centre of the stick region.

The network consists of six convolutional layers, the first having a kernel size of 5 × 5, the other having a kernel size of 3 × 3. The number of feature maps of the convolutional layers are as follows: 1 (input, greyscale) - 4 - 4 - 8 - 8 - 8 - 4. All convolutional layers are equipped with the ReLu (rectified linear unit) activation function, and the first five convolutional layers are each followed by a 2 × 2 max-pooling layer. After the final (sixth) convolutional layer, there is a fully connected layer of size (196 -> 64) equipped with the ReLu activation, followed by the final fully connected layer of size (64 -> 2) equipped with the Sigmoid activation function.

The network was trained over 45 epochs using the Adam Optimizer, minimizing the mean squared error loss. A batch size of 16 and a learning rate of 0.0005 was used.