

## Supplementary Materials

### **A Safe Human-Robot Physical Interaction-Communication Module with Clinical Potentials**

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Supplementary Text

Figure S1: Features Extraction function.

Figure S2: Training algorithms and plot snapshots on (a) round vs square, (b) round vs triangle, (c) square vs triangle, (d) all three shapes, from top to bottom respectively

Video S1: Demonstrations of touches

```

function feat = extract(touch)
%Duration
duration = touch.Time(end) - touch.Time(1);

%Aspect Ratio
aratio = range(touch.Sensor1)/range(touch.Sensor2);

%Median
medS1 = median(touch.Sensor1,"omitnan");
medS2 = median(touch.Sensor2,"omitnan");

%Mean absolute deviation(MAD)
devS1 = mad(touch.Sensor1);
devS2 = mad(touch.Sensor2);

%Local max/mins
idxmin1 = islocalmin(touch.Sensor1);
numminS1 = nnz(idxmin1);
idxmax1 = islocalmax(touch.Sensor1);
nummaxS1 = nnz(idxmax1);

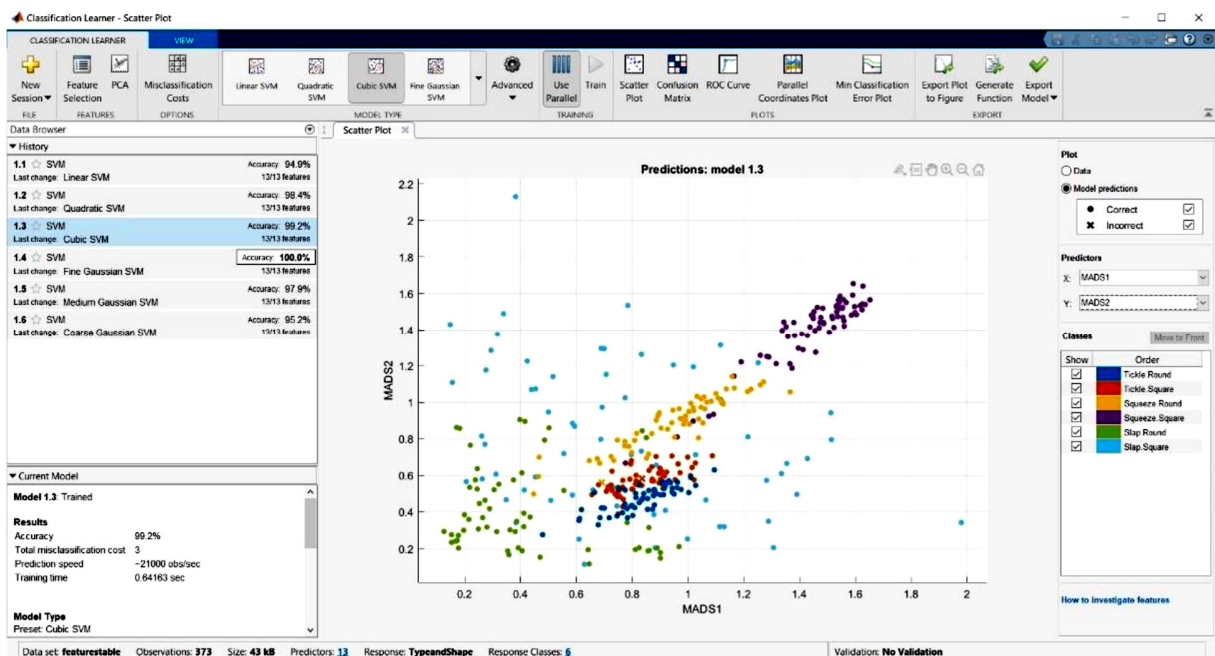
idxmin2 = islocalmin(touch.Sensor2);
numminS2 = nnz(idxmin2);
idxmax2 = islocalmax(touch.Sensor2);
nummaxS2 = nnz(idxmax2);

%Velocity
dT = diff(touch.Time);
dX1dT = diff(touch.Sensor1)./dT;
dX2dT = diff(touch.Sensor2)./dT;
avgdS1 = mean(dX1dT,"omitnan");
avgdS2 = mean(dX2dT,"omitnan");

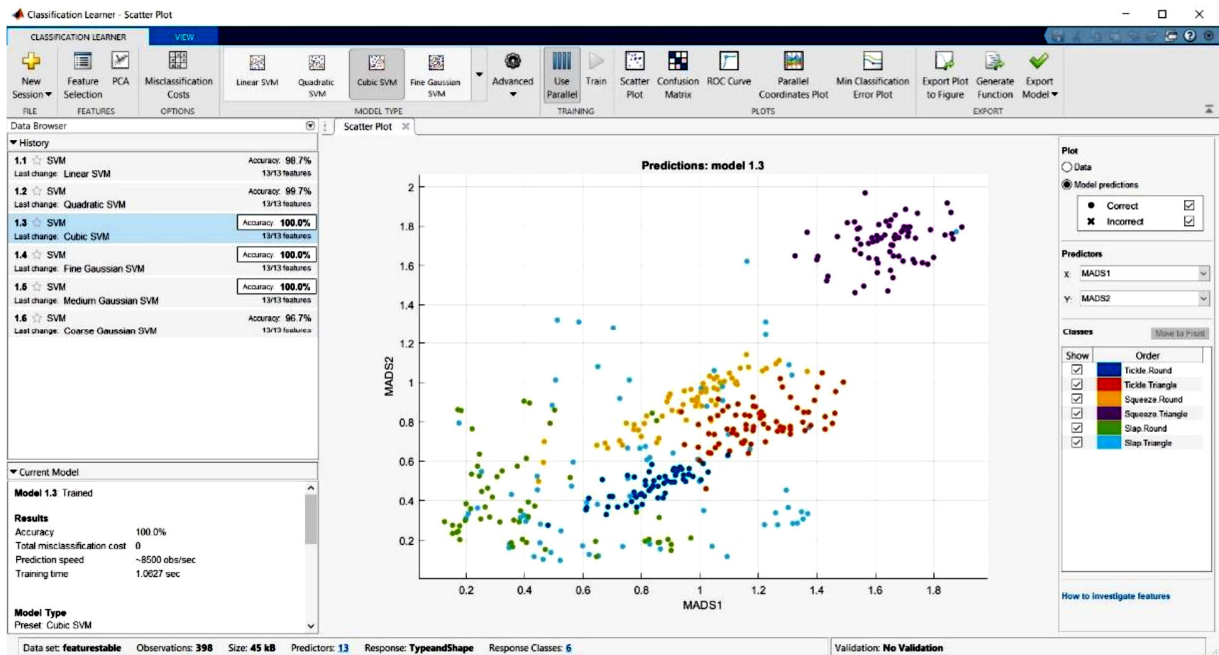
%Correlation
corrS1S2 = corr(touch.Sensor1,touch.Sensor2,"rows","complete");

```

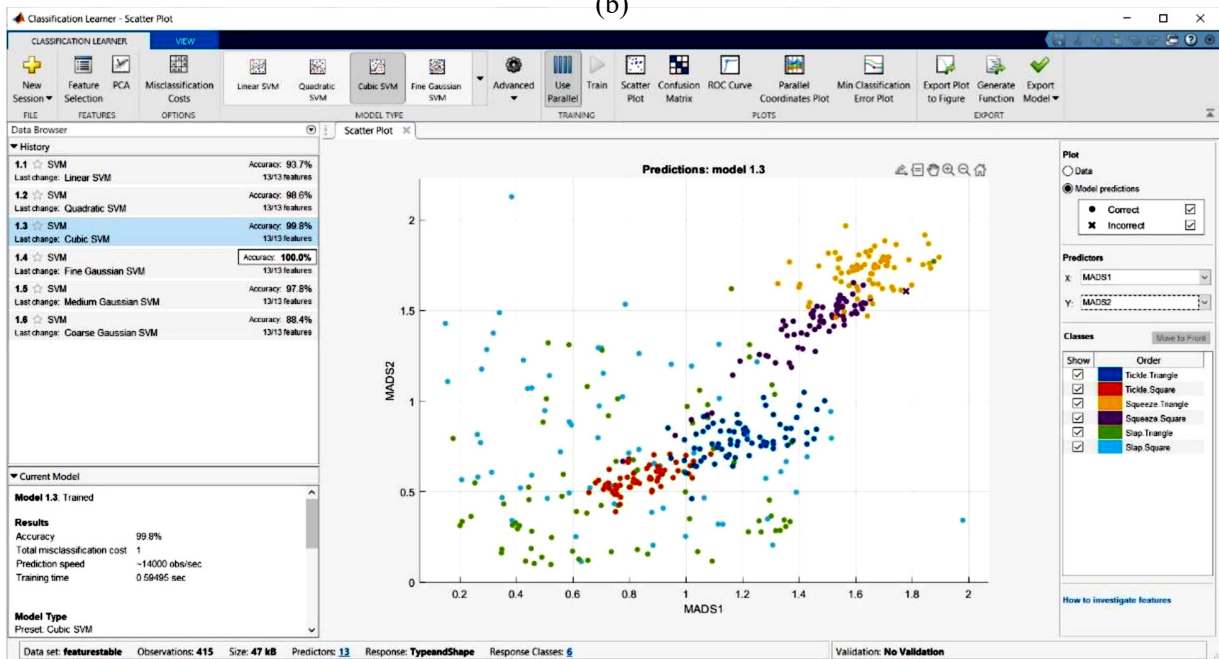
Figure S1. Features Extraction function.



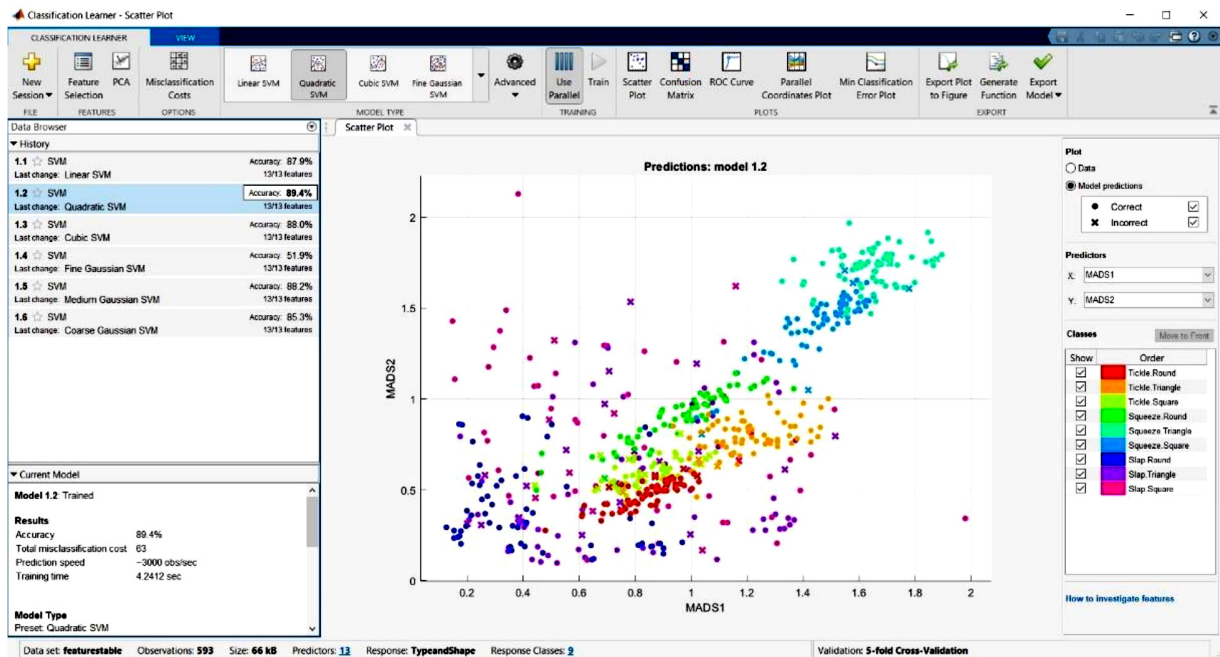
(a)



(b)



(c)



(d)

**Figure S2.** Training algorithms and plot snapshots on (a) round vs square, (b) round vs triangle, (c) square vs triangle, (d) all three shapes, from top to bottom respectively.