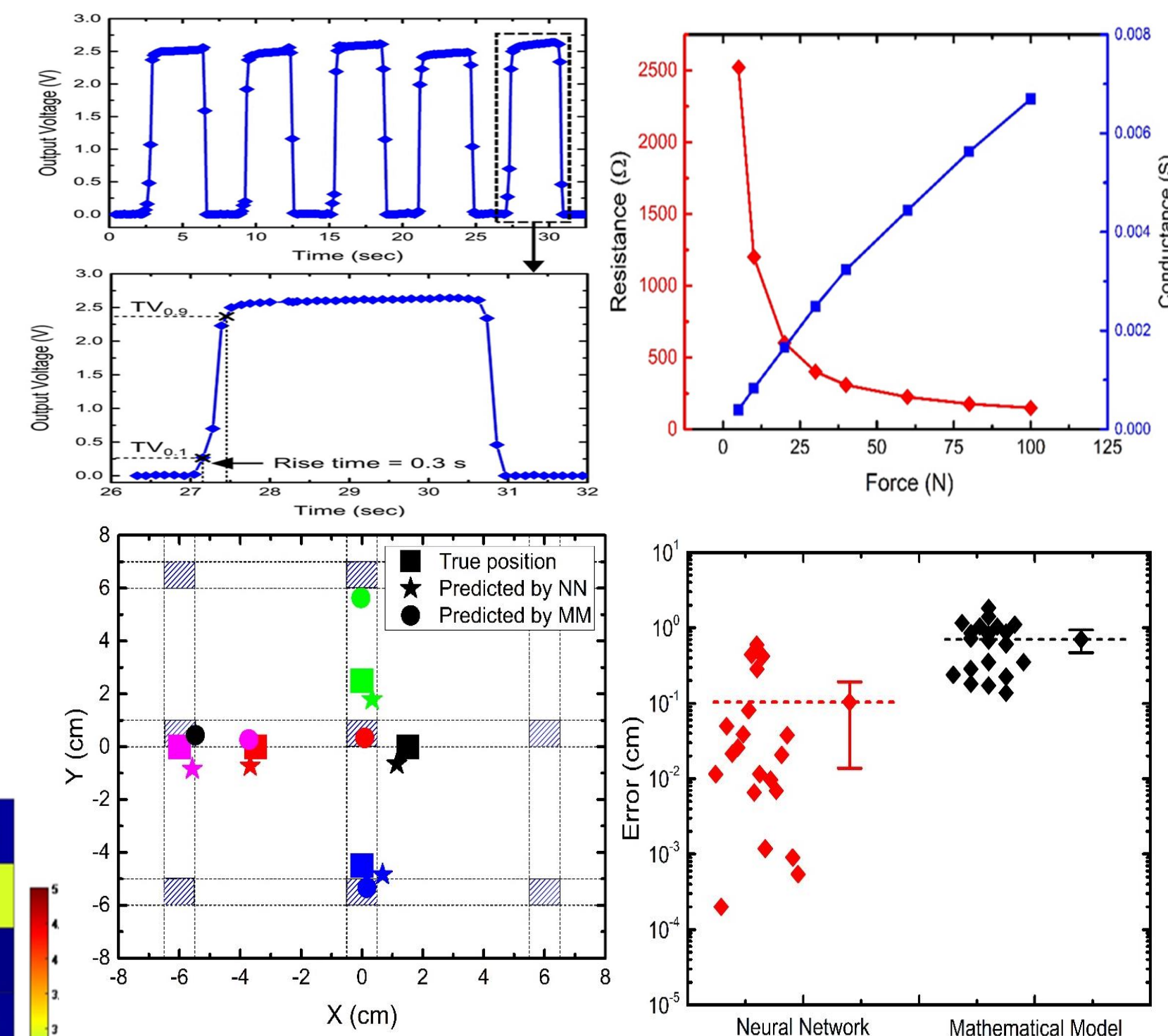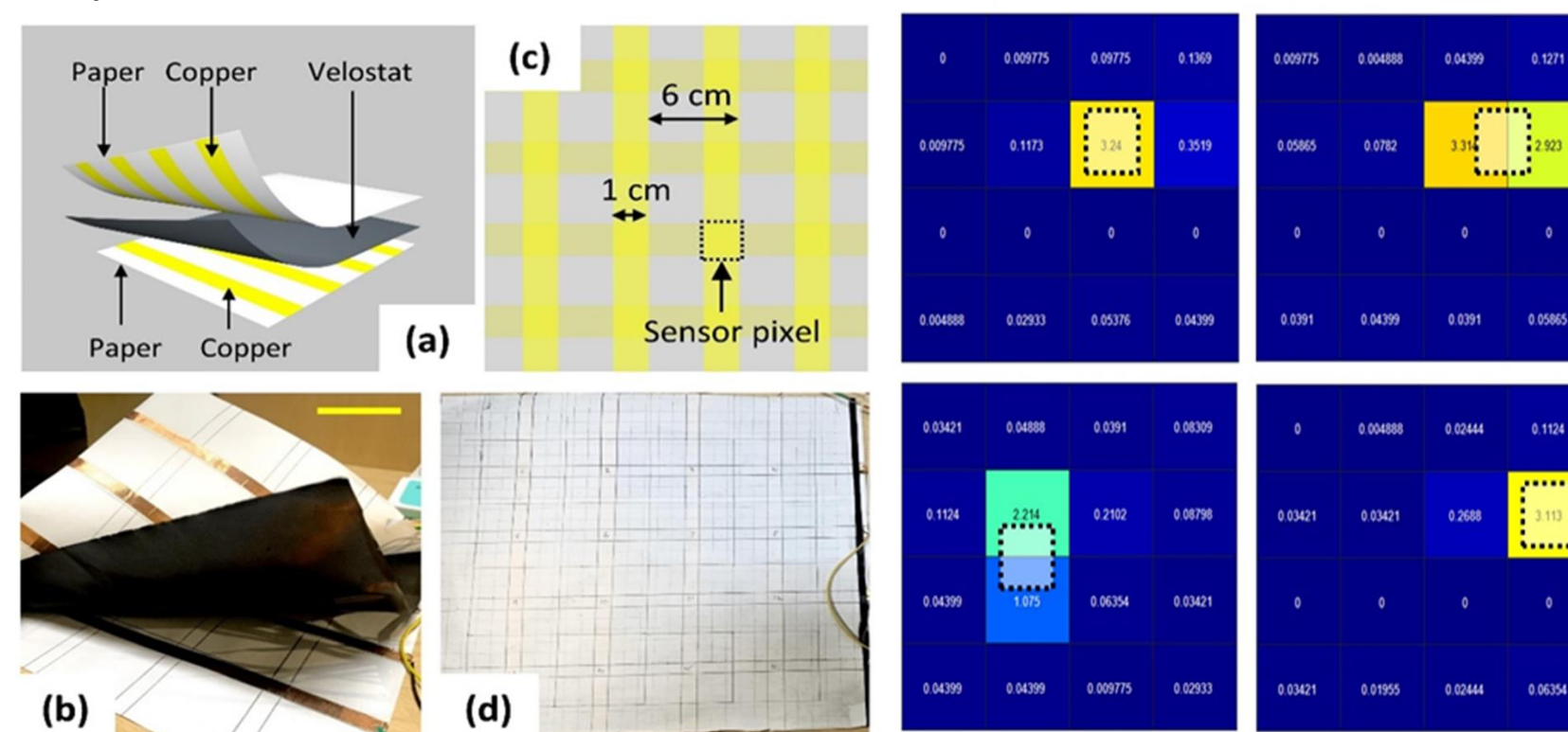# Low-cost Pressure Sensor Matrix for Activity Monitoring in Stroke Patients using Artificial Intelligence

ABSTRACT

- Muscle weakness is a common consequence of stroke that reduces physical activity of the affected body part.

- To restore and build physical strength various exercises can be done.

- To analyze and recognize the activity and movement of hands while performing these exercises, we have developed a 4 by 4 flexible pressure sensor matrix.

- With this system, a patient is asked to move a weight to a particular location and the error in positioning along with the time taken to complete the task is calculated.

- Experimental results demonstrate that the algorithm gives a mean error of 0.103 cm in detecting the position of load.

- Advantages of the proposed pressure sensor matrix are cost effectiveness, facile fabrication, high sensitivity, robustness and flexibility.

SENSOR DESIGN

- A 4 x 4 pressure sensor matrix was fabricated as a sandwich structure with three layers.

- Layer 1 and layer 3 were papers with copper electrodes in a vertical and horizontal alignment, respectively.

- The total thickness of the pressure sensor matrix was approximately 300 μm, making it highly flexible.

- The copper electrodes form a crossbar architecture with the velostat layer as the active pressure sensing layer.

- The individual sensor pixel is of size 1 cm x 1 cm with a pitch of 6 cm.

PUBLICATION