

Description of Additional Supplementary Files:

Supplementary Movie 1: AMMSG for Multimodal Signal Sensing.

Supplementary Movie 2: AMMSG for Robotic Arm Control.

Supplementary Movie 3: AMMSG for Temperature and Pressure Sensing.

Supplementary Movie 4: Temperature and Pressure Reproduction at the Fingertips of Robotic Arms.

Supplementary Movie 5: A Closed-loop Human-machine Interaction Demonstration of AMMSG for Sensing, Control, and Feedback.