

INTERNATIONAL RESEARCH COOPERATION

2. AFOSR, 2020–2022: Edge intelligence-based hand gesture recognition using wearable multimodal sensors for human machine interaction:

The project proposes a simple and effective technique for realizing a predefined set of hand gestures. Below is some summary of new conclusion of the thesis:

(1) Designing sets of hand gestures to convey basic control commands of household electrical appliances, in which, each hand movement is a series of hand shapes with closed cycle.

(2) Proposing and developing an effective learning scheme based on parametric exploration, supporting hand detection system with high accuracy and real-time response. Hence, proposing an effective solution to segment the hand gesture from successive series of images using the selected features of hand shapes.

(3) Proposing and developing a method of dynamic hand gesture combined with spatial features based on manifold representations (ISOMAP) with time features. The new performance space helps separate gestures clearly, thus improving the efficiency of recognition problems.

(4) Proposing a solution of phase synchronization in the performance space. The solution clarifies the problems relating to speed of hand gesture; or varying the number of frames per gesture; hence improving the efficiency of recognition problems.

(5) On the basis of contents of a research report, implementing control systems for household electrical appliances. The system met the requirements for identification accuracy, real-time response.