Adhe Rahmatullah Sugiharto Suwito Putro, 2019. **Motion Control of Hand Prosthesis Based on Muscle Signals in Below Elbow Amputated Patient.** *This project is supervised by Dr. Ir. Soegianto Soelistiono, M.Si. and Akif Rahmatillah, S.T., M.T., Biomedical Engineering, Physics Department, Faculty of Science and Technology, Airlangga University.*

ABSTRACT

The final procedure in the amputation rehabilitation program is to train the patient's movements for the use of prostheses. Research on prostheses has developed to the use of Electromyography (EMG) to control the motion of prostheses. This research aims to control the prosthesis movement using EMG signals of amputated patients to open, pinch, and hold movements. The patient performs wrist flexion for grip, wrist extension for pinch, and relaxation for open. EMG signals from M. Extensor digitorum and M. Flexor digitorum will be recorded using Myo armband sensor and sent to the Personal Computer (PC) for feature extraction of mean, root mean square, and variance values, then the classification is carried out by Extreme Learning Machine (ELM) algorithm. After the classification obtained, the data will be sent to Arduino Uno to move the hand prosthesis using two DC motors with screw. In this study, the accuracy of testing of the ELM using 30 hidden nodes is 97%. The result of real-time mechanical testing in amputated patients with 5-second output latency is 91%. The hand prosthesis proformance between the command movement with the movement classification, the command movement with the prosthesis response, and the classification with the prosthesis response are equal.

Keywords **:** *amputated patient, EMG signal, Myo armband, ELM, hand prosthesis*