# ABSTRAK

Tangan prostetik menjadi salah satu kebutuhan penting bagi pasien yang memiliki kecacatan fisik berupa kehilangan lengan. Hal tersebut disebabkan susahnya untuk beraktivitas normal bahkan mempengaruhi psikologis bagi penyandang disabilitas tersebut. Tujuan dari penelitian ini adalah agar aktivitas yang dilakukan pasien sehari-hari dapat ditunjang lebih baik dengan tangan prostetik berbasis sinyal otot lengan EMG. Pengembangan prostetic hand dengan kendali sinyal EMG berbasis supervised machine learning dan wireless control yang menggunakan Arduino BLE 33, OYmotion dan kendali bluetooth akan semakin memberikan kemudahan untuk para pengguna tangan prostetik. supervised machine learning akan memberikan user keluasaan untuk membentuk datasheet dan menggunakannya dalam membentuk gerakan tangan melalui motor actuator. Selain itu penggunaan Arduino BLE 33 berperan penting pada wireless control juga akan memberikan akses lebih luas dalam kontrol tangan bahkan melakukan monitoring aktifitas otot user melalui android. Pengujian platform machine learning ini menggunakan datasheet yang telah diekstraksi fitur menggunakan MAV (Mean Absolute Value), RMS (Root Mean Square), dan VAR (Variance of EMG. dari 10 orang berbeda. Klasifikasi terbaik pada penelitian ini dimiliki VAR dengan mendapatkan akurasi 81% pada classifier Random Forest. Hasil dari machine learning tersebut telah diuji pada beberapa responden dan dapat menggerakkan tangan prostetik dengan gerakan hand open, hand close, curve, dan pinch.

*Kata Kunci: Tangan Prostetik, Arduino BLE 33, Machine Learning, Wireless Control*

# ABSTRACT

*Prosthetic hands are one of the important needs for patients who have physical disabilities in the form of losing an arm. This is due to the difficulty in carrying out normal activities and even affecting the psychology of persons with disabilities. The purpose of this study is that the daily activities of patients can be better supported by a prosthetic arm based on EMG arm muscle signals. The development of prosthetic hands with EMG signal control based on supervised machine learning and wireless control using Arduino BLE 33, OYmotion and Bluetooth control will make it even more convenient for prosthetic hand users. Supervised machine learning will give users the flexibility to form datasheets and use them to shape hand movements via actuator motors. In addition, the use of Arduino BLE 33 plays an important role in wireless control which will also provide wider access to hand control and even monitor user muscle activity via Android. Testing the machine learning platform uses a datasheet that has been feature extracted using MAV (Mean Absolute Value), RMS (Root Mean Square), and VAR (Variance of EMG) from 10 different people. The best classification in this study belongs to the VAR with an accuracy of 81% in the Random Forest classifier. The results of machine learning has been tested on several respondents and could move the prosthetic hand with hand open, hand close, pinch, and curve movements.*

*Keyword: Prosthetic Hand, Arduino BLE 33, Machine Learning, Wireless Control*