



# Valentinus Mahendra Aaron Quendangen

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Individuals who are motivated to work hard in carrying out work activities to achieve success and gain experience. Like to learning new things to gain more experience, especially by doing or helping some project or research. During my studies in Biomedical Engineering major at Airlangga University, I learned a lot, including programming (C++, Python, Matlab, JavaScript), analog and digital electronic, anatomy, physiology, and control system.

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## Education

### **SMAK Santo Yoseph Denpasar**

2016-2019

Science Major

### **Universitas Airlangga**

2019-2023

Biomedical Engineering

Medical Instrumentation Major

GPA/IPK: 3.68

## Undergraduate Thesis

During my studies in Biomedical Engineering major at Airlangga University, I specialized in the Medical Instrumentation field and conducted a research thesis titled "Design of Electrical Impedance Tomography (EIT) To Detect Breast Cancer Using Analog Discovery Module". This project involved both hardware and software. The hardware consists of some basic circuitry including filter, multi/demultiplexer, VCCS, and instrument amplifier, and the controller using Analog Discovery 2. The software consists of Analog Discovery programming (JavaScript) and EIDORS (Matlab) for the image reconstruction.

## Language

- Indonesia
- English (Unair ELPT: 540)

## Experience

### **Organization / Committee**

- **FORMAT (Faculty Press Organization)**  
Layouter and Designer

- **BKK (Faculty Catholic Organization)**

MEDINFO (Media and Information)

Head of Human Resources Development

## Skill

- Programming:  
Python/MicroPython, C++,  
Matlab, HTML
- Instrument: Arduino, ESP,  
Analog Discovery
- Laser cutting, Basic  
electronic, Electrical circuits,  
analog and digital electronics,  
Soldering, PCB design,  
Graphic design

## Achievement

**Best team work at Sebelas Maret International IoT Challenge 2021 "IoT Technology For Covid-19 Pandemic Recovery"**

**Silver award for iMIT SIC 2021 (4th International Malaysia-Indonesia-Thailand Symposium on Innovation and Creativity 2021) held by UiTM Cawangan Malaysia**

**"3d (Three-Dimensional) Lung Cancer Detection And Identification Based On Mixed Reality"**

## Other Experience

- Mentor on Coding Workshop for Biomedical Engineering 2021  
March 2021 - June 2021 | Teach the basic use and how to make a simple programs using C++ and Python
- Community service activities (Pengmas)  
September 2022 | Training on Making IoT-Based Medical Sensors as an Introduction to Smart Medical Devices for High School/Vocational School Students in Trenggalek Regency, East Java Province | "Training on the Design and Construction of Audiovisual Based Fatigue Detection Tools to Improve Work Quality and Health" (<https://doi.org/10.29303/pepadu.v4i2.2370>)
- X-Mano (Exoskeleton Hand Robot) for Movement Therapy of Post-Stroke Patients | Merdeka Belajar Kampus Merdeka (MBKM) - Matching Fund  
September 2022 - January 2023 | X-Mano (Exoskeleton Hand Robot) for Movement Therapy of Post-Stroke Patients. Part of the MBKM activities held by the Minister of Education and Culture. This project is a collaboration between IBE-Reality and Airlangga University to develop an exoskeleton hand to help post-stroke patients.
- Research Engineer Assistant at Neonatal Research Group FK (Faculty of Medicine) Universitas Airlangga  
August 2023 - February 2024 | Assisting in the development of research on the Smart Phototherapy System Airlangga Bilirubin Nesting (AirBiliNest), which is a phototherapy device for jaundiced babies. Assist in assembling, reproduce and testing the prototype as well as implementing the MBKM Matching Fund events related to this device.

## Personal Project

Sometimes I try to make something in my spare time. Sometimes useful things and sometimes useless things. Although sometimes the things I make are not perfect but this can add to my experience of trial and error

- EMG-ECG Module for Microcontroller

I try making an EMG-ECG module for a microcontroller like Arduino or ESP. The module consists of an instrument amplifier using AD620 IC and some basic bandpass filters with an inverting amplifier using Op-amp IC. After some adjustment in the gain, the module can detect muscle movement in the forearm flexor muscle and heartbeat, with only 3 connections to the microcontroller (2 for the supply and 1 for the output). Then the module can be connected as a sensor to move robotic hand

- Bioimpedance measure using a Microcontroller

A device for measuring a person's bioimpedance, using a microcontroller as a signal processor and reader for measurement results, and displaying them. The device consists of a signal generator that uses a Wien bridge oscillator circuit or AD9833 Module to produce a sine signal, VCCS, instrument amplifier, and AC-DC. The results of the tool can read the impedance value both on the resistor and on the human body, and can be used to estimate the angle at the human elbow, which can be used to move a robotic hand

- Low-Cost Electrical Impedance Tomography with Microcontroller

Making Electrical Impedance Tomography (EIT) using a Microcontroller, namely ESP32-S2 with MicroPython. This tool consists of a microcontroller which functions to control the electrode output, regulate the signal frequency, and obtain data. Then the data will be processed using the Python program with the PyEIT library to reconstruct the resulting data into a 2D image. This EIT can be used on several types of electrodes with a maximum of 16 electrodes.