Jurnal Robotik
Vol 1, No.1, September 2021, pp. 16 – 22

ARDUINO UNO MICROCONTROLLER-BASED SALT FISH DRYING TOOL

[1]Adam Saputra, [2]Diana Sari DJ
[1]Program Studi Teknik Komputer,
Fakultas Teknik dan Ilmu Komputer, Universitas Teknokrat Indonesia
[2]Program Studi Informatika,
Fakultas Teknik dan Ilmu Komputer, Universitas Teknokrat Indonesia
Email: [1]adam_saputra@teknokrat.ac.id , [2]dianasari@teknokrat.ac.id

Keyword:
Light sensor
Rain sensor
Arduino uno microcontroller

ABSTRACT

Along with the development of technology, especially in the field of electronics, many produce tools and applications that can be used to facilitate human work in everyday life. Where the previous work was done manually is now slowly switching to an automated system. Like the salted fish drying that is mostly done manually, we can now do it automatically with a salted fish drying tool based on arduino uno microcontroller designed to help saltfish entrepreneurs in the process of drying. This arduino uno microcontroller-based salt fish drying tool requires a light sensor as a light detector and a rain sensor as a rainwater detector. The result of the combination of the two sensors can be used as input or output by arduino uno microcontroller as the controller. The results showed that the inputs inserted into the microcontroller were able to move the miniature salted fish in accordance with the weather conditions outside.

1. INTRODUCING

Salted fish is a foodstuff made from preserved fish meat by adding a lot of salt. With this method, fish meat that usually rots in a short time can be stored at room temperature for months, although it usually has to be tightly closed to avoid damage to fish[1]–[3]. Salted fish certainly need the sun to help salted fish entrepreneurs dry fish, often salted fish entrepreneurs complain about the weather that often changes every time and inhibits the process of drying fish. Especially in the area of Pasar Island Village of Bandar Lampung Coral City. One of the owners of a salted fish drying business named Mr. Abdul Aziz complained about the erratic rainy weather because workers had to go around to lift salted fish to the storage area so as not to be exposed to rain.

The process of drying fish up to 2 tons with a drying area of 25x30 and 15x30 square meters and requires 20 workers to sunbathe, flip, and lift salted fish. This can be troublesome for workers in the removal of salted fish if it often rains suddenly, therefore the author wants to make a tool that can relieve salted fish entrepreneurs without worrying about salted fish being exposed to rain so that in this writing will be made a Salted Fish Drying Tool Based on Arduino Uno microcontroller[4]–[6].

A microcontroller is an electronic circuit that serves as a controller that regulates the running of the working process of an electronic circuit[7]–[9]. In a microcontroller IC, there is CPU, Memory, Timer, Input /Output, Analog-Digital Converter (ADC), Digital Analog Converter, and others.

This tool is used to detect rain and shine so it is very practical because workers only put salted fish on the tool without worrying about fish that are sunbathing wet at the time of the rain. This tool is equipped with automatic salted fish flippers based on the time that has been set so that workers no longer have difficulty in flipping salted fish.

A microcontroller is a computer inside a chip used to control electronic equipment, emphasizing efficiency and cost-effectiveness. Technically microcontrollers are divided into 2 types, namely RISC and CISC, each of which has a family. RISC (Reduced Instruction Set Computer) is limited to instruction but with more facilities. CISC stands for (Complex Instruction Set Computer) which is a more complete instruction but with limited facilities[10]–[12].

2. RESEARCH METHODS

A flowchart diagram is a type of diagram that represents an algorithm, workflow, or process, which displays steps in the form of graphical symbols[13]–[15], In the flowchart below explains how the work and process tools work:

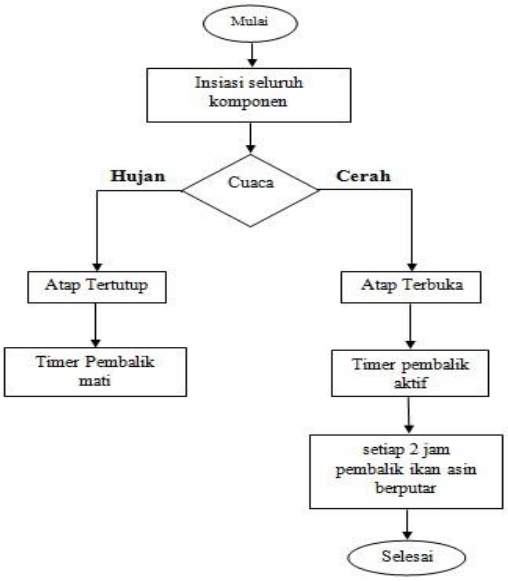

Figure 1. Flowchart Diagram

The research tools used in the manufacture of this tool are

1. Computer/laptop
   It is used as a program maker, program compiler, and uploads programs into microcontrollers.
2. Multitester
   Multitester is an electrical measuring device that can measure the value of electronic components. In addition, multitester is also used to determine the condition of a component.
3. Drill
   The drill is used as a hole-biter to insert bolts used to attach electronic components.
4. Solder
   A solder is a tool used to solder Terminal (foot) Electronic Components so that it blends with the Circuit Board (PCB) using Tin or often called the Soldering Process.
5. Tin Vacuum cleaner
   Tin suction (attractor) or solder sucker is equipment that serves to suck up melted tin with solder when removing electronic components. This tin vacuum cleaner is very useful for a technician when going to remove damaged components to be replaced with new components, because considering that in general the components that have been soldered are difficult to lift without disappearing first the tin that glues them.
6. Grindstone
   A grinder is an electrical cutting tool used as a cutting aid in the manufacture of tools.
7. Tang Rivet
   Rivet tang is a tang that is usually used to install roving nails on triplets and acrylics.

8. Screwdriver and Tang
   Screwdrivers and Pliers are used to install nuts and bolts in the manufacturing process of this tool.

3. RESULTS AND ANALYSIS

3.1. Power Supply Network Planning

In the use of an electronic device, a power supply is needed to supply all the power for all components so that an electronic circuit can work. Then to be able to maximize system performance, a design of a power supply is needed so that microcontrollers can work as quickly. Here's a piece of power supply planning. The power supply circuit can be seen in the following image

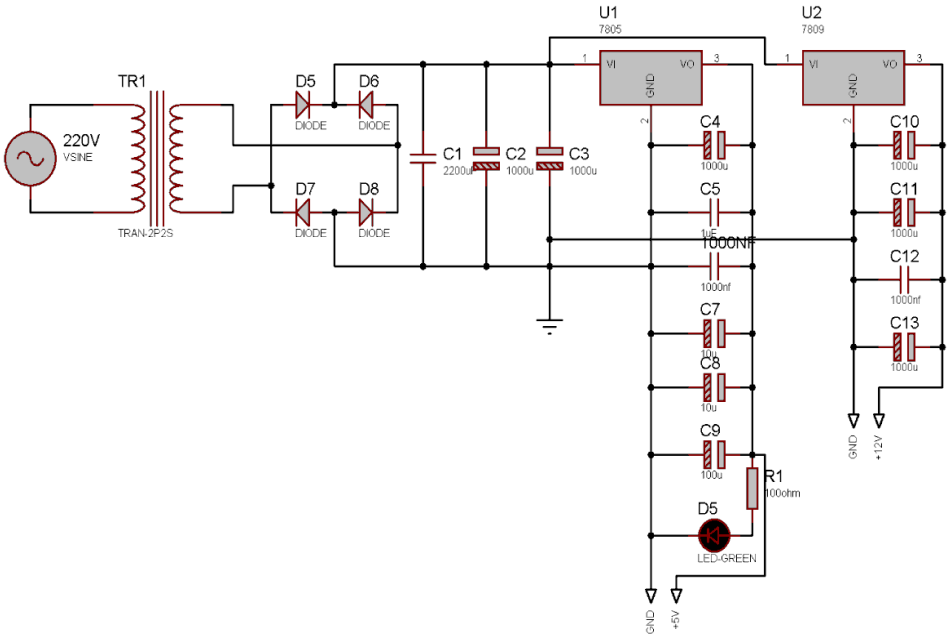

Figure 1. Power Supply Network Planning

3.2. Arduino IDE Software Implementation

The design of the system on Arduino software is very important because this is where the program is created and uploaded using Arduino software, this aims to insert program code into Arduino[16]–[18].

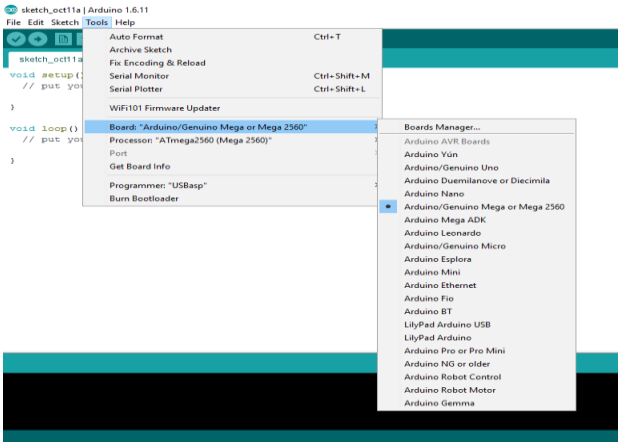

Figure 2. Initialization of Arduino Type on IDEArduino

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Program code writing is done to provide instructions for programming language C which aims to run the system to work according to the program code that has been filled into an Arduino, without the system program code can not work because the program code is the main part in we make a tool[19], [20]. The following is a layer view to fill in the program code in the Arduino IDE Software

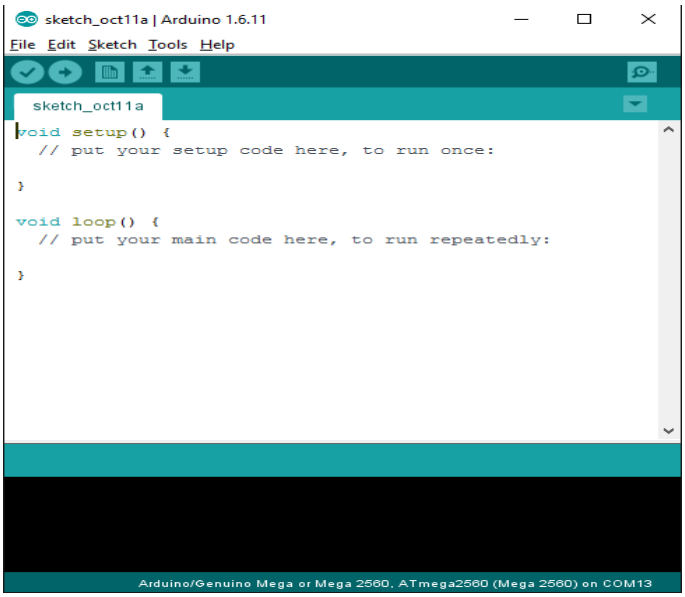

Figure 3. Sketch Program Writing Layer

3.3. Testing

The purpose of microcontroller testing on this tool is to determine whether the tool that has been made has worked properly and is following the design or not. Testing on this tool includes testing each block as well as testing as a whole. Testing each block is done to determine the location of errors and facilitate microcontroller analysis if the tool does not work as designed.

Power Supply testing is one of the most important components in the manufacture of this tool because the power supply is the source of voltage to turn on all the components in this tool. In this tool, the power supply used by 2 Ampere by using a CT Transformer is transformed into two voltages, namely 12V dc, and 5V dc. Here's a test of the power supply suite:

Table 1. Voltage Source Usage Table

Input	Voltage drop	IC Regulator	Usage Description	Voltage
Electricity 220V AC	12V DC Transformer Adapter	LM 2596	Power Arduino	5Volt DC
			Power Atmega8	
			Power Window	12Volt DC

This rain sensor is used to detect rain on salted fish drying equipment aimed at keeping salted fish from being exposed to rain. In the tool made rain sensor used to detect rainwater. The test is done by dripping water on the sensor board, then the rain sensor captures the signal that the rain has come and the roof immediately closes.

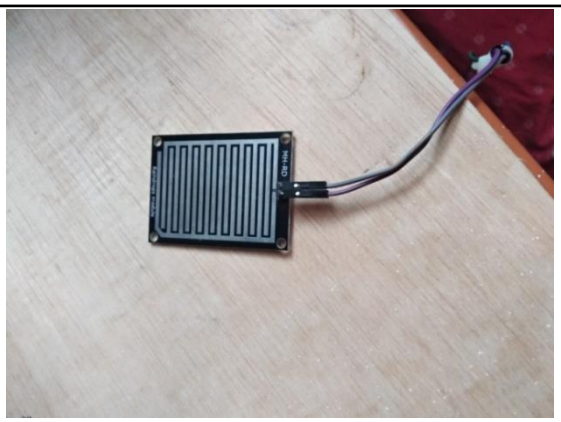

Figure 4. Rain Sensor Testing

Testing on this light sensor is done by giving light to the sensor and then the sensor gives data to the servo and then the servo will open the roof.

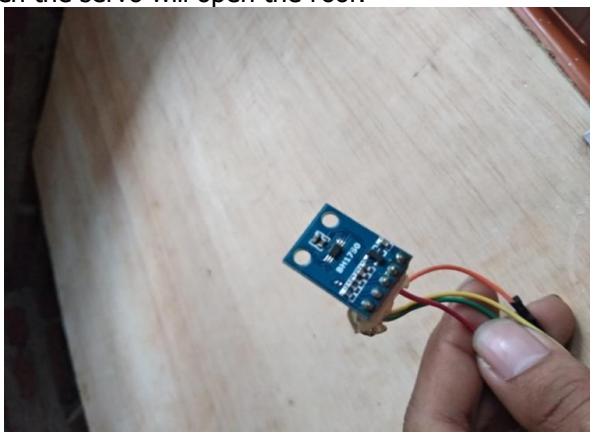

FIgure 5. Light Sensor Testing

The use of motors with gear boxes or commonly called servo on this tool is used as a cover and door opener. Here are the results of testing servo components

Figure 6. Servo Testing

The design of this tool using Relay is intended to break the voltage on the dc motor controlled by Atmega8 Here are the test results on this tool:

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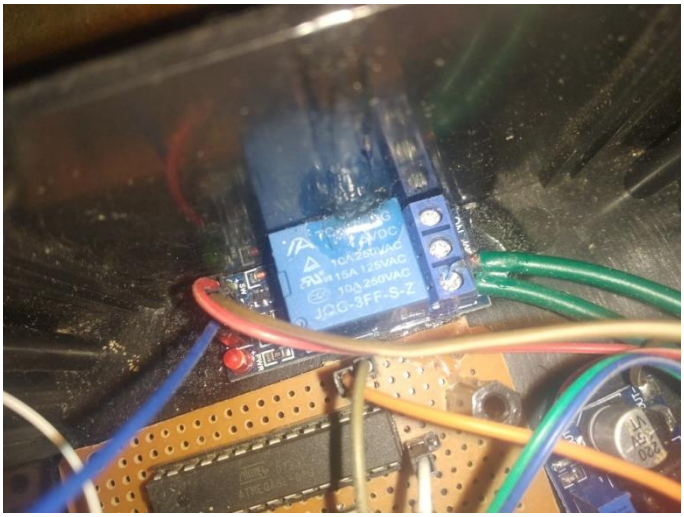

Figure 7. Relay Testing

This power window test is combined as a round mover of salted fish turning. Here are the test results on the tool. The result of the rotation speed of the power window motor is adjusted using a stopwatch when the motor moves from the middle position, namely precision with salted fish turning.

Table 2. Power Window Speed Testing

Number	Power Window	
	U	Down
1	3,3	3,3
2	3,3	3,1
3	3,3	3,1

4. CONCLUSION

This Arduino Uno-based salt fish drying tool can be used as a solution to relieve workers in salted fish drying, this tool can open the roof and dry at sunrise and can flip salted fish automatically when the rain can close automatically. So that it can help entrepreneurs in drying salted fish

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