# MARATHWADA MITRA MANDAL'S COLLEGE OF ENGINEERING , PUNE

**ELECTRONICS AND TELECOMMUNICATION DEPARTMENT**

**TITLE:-**MACHINE TOOL MONITORING USING ELECTRIC CURRENT ANALYSIS OF THE SPINDLE MOTOR IN CNC MACHINE.

## AIM

The aim of this DAQ device is to analyze electric current analysis has the potential to offer a more direct and accurate assessment of the spindle motor's health, as changes in current patterns can indicate various issues such as tool wear, improper machining parameters, or impending mechanical failures.

## OBJECTIVES

1. The electric current drawn by the spindle motor is a critical parameter to monitor. By analyzing this current, you can assess various aspects of machine tool performance.
2. Computer Numerical Control (CNC) is a manufacturing process in which pre-programmed computer software observes the movement of factory tools and machinery. This process can be used to control a range of complex machinery, from CNC routers.
3. By continuously monitoring the spindle motor's current, user can predict when and where the maintenance is required.


## GROUP MEMBERS

1.Avnish Raj BE102
2.Purva Jiwane BE146
3.Om Pokharkar BE164

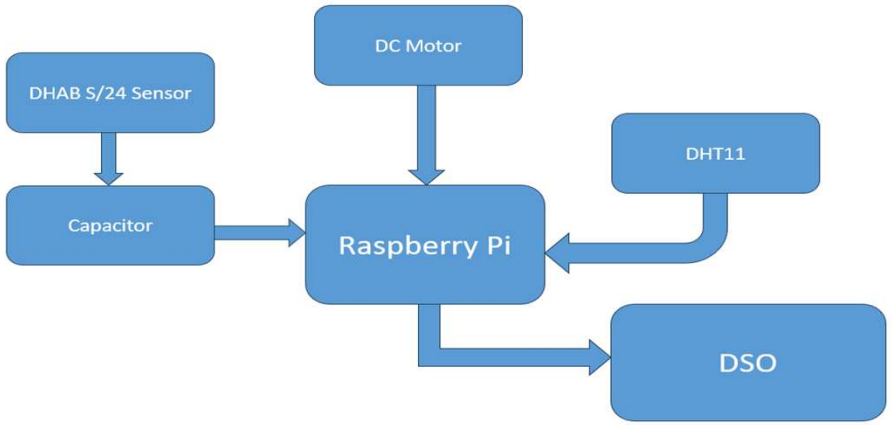
## PROJECT GUIDE

Prof. Pallavi Wadkar

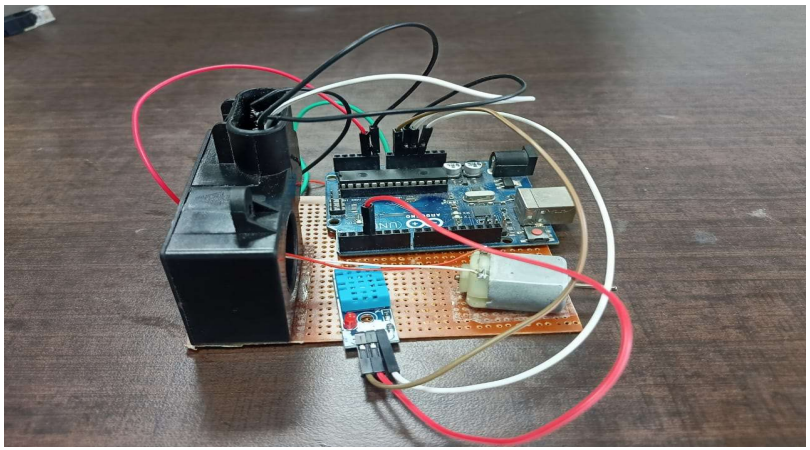
## PROJECT CO-GUIDE

Mr. Sandeep S. Mutalik


## BLOCK DIAGRAM




## HARDWARE



## WORKING

- DHAB S/24 sensor is the hall effect sensor which gives us the choice of having different current measuring ranges in the same housing (from ± 20 up to ± 600 A).
- This hall effect sensor is connected to Arduino.
- Sensor has 4 terminals including 2 current measuring channel 1 range upto ± 75 A and ± 500 A for channel 2. Other 2 is 5V input and GND terminal.
- DC input is applied to the sensor for measuring the current. DHT11 sensor is used to measure the temperature of the DC motor.
- Capacitors of 0.1 microfarad are used one is used between the output terminal of hall effect sensor and Arduino.
- Another capacitor is used between the input terminal of hall effect sensor and Arduino.

## CONCLUSION

- It is an effective way to prevent damage to machine tools, cutters and workpieces during production processes.
- To be acceptable by the industries by maintaining low cost.
- These sensors transmit data to the monitoring system, which can be part of the CNC machine control system or a stand-alone monitoring device.
- To regularly monitoring and analysis of flow which reduces the performance and life of spindle motors.
- To allow the operator to take all protective measures to ensure the safety of the spindle motor.

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