Digital Signal Processing

Project Report

Submitted by: Imaan Shahid

Submitted to: Dr Ali Hassan
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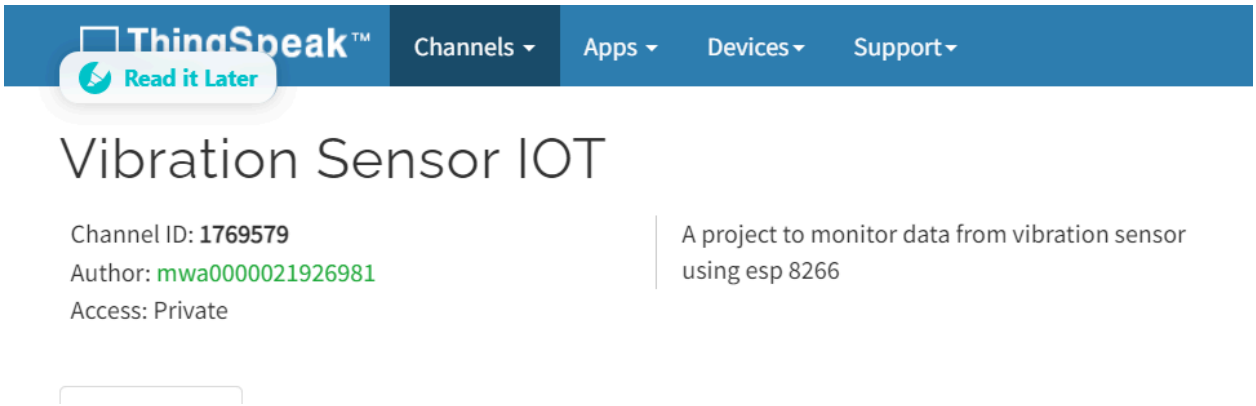
Syndicate: B
Computer Engineering - 41

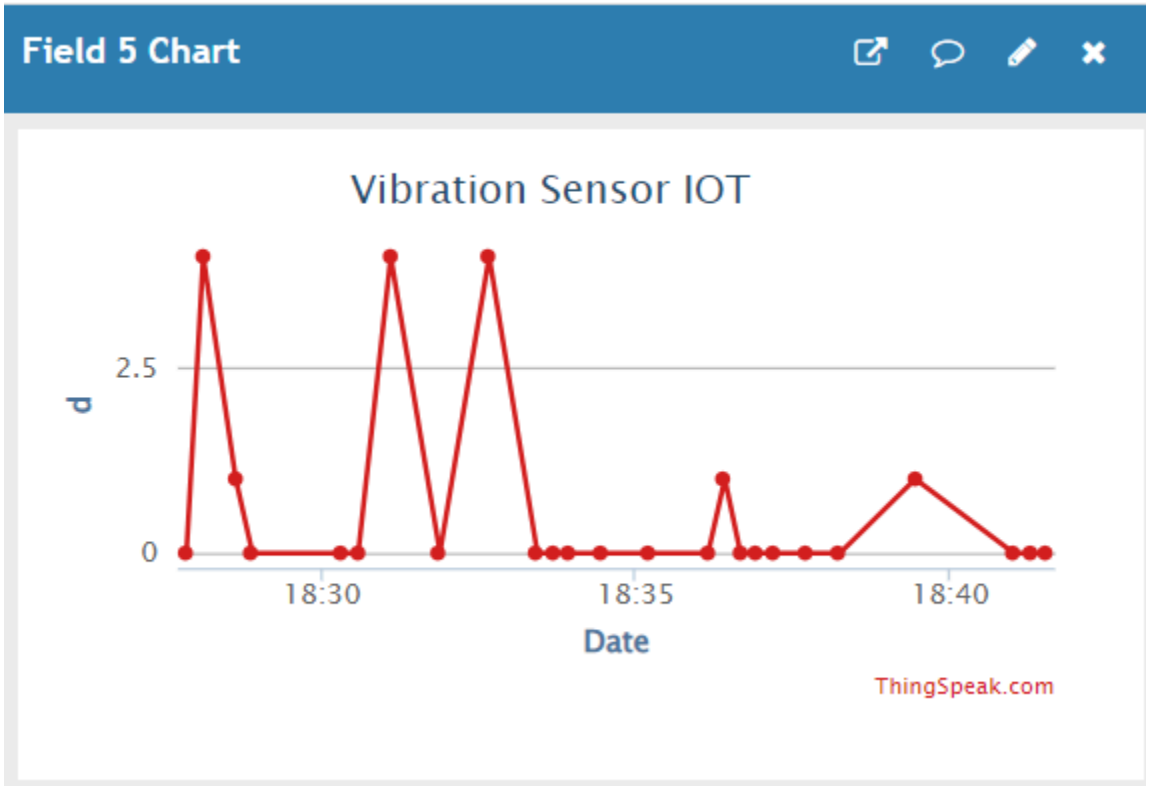
Arduino Code:

```
#include "ThingSpeak.h"
#include <ESP8266WiFi.h>
#include "DHT.h"
#define DHTTYPE DHT11
#define dht_dpin 0

DHT dht(dht_dpin, DHTTYPE);

char ssid[] = "";
char pass[] = "";

int status = WL_IDLE_STATUS;
WiFiClient  client;

int sensorValue;


unsigned long myChannelNumber = 1769579;
const char * myWriteAPIKey = "V5W28NS6X93R78IS";

void setup() {
  WiFi.begin(ssid, pass);
  ThingSpeak.begin(client);
  Serial.begin(9600);
}

void loop() {
  sensorValue = analogRead(A0);
  float h = dht.readHumidity();
  float t = dht.readTemperature();

  Serial.println("Sensor Value");
  Serial.println(sensorValue);
  ThingSpeak.writeField(myChannelNumber, 5, sensorValue, myWriteAPIKey);
  ThingSpeak.writeField(myChannelNumber, 3, h, myWriteAPIKey);
  ThingSpeak.writeField(myChannelNumber, 4,t, myWriteAPIKey);
}
```

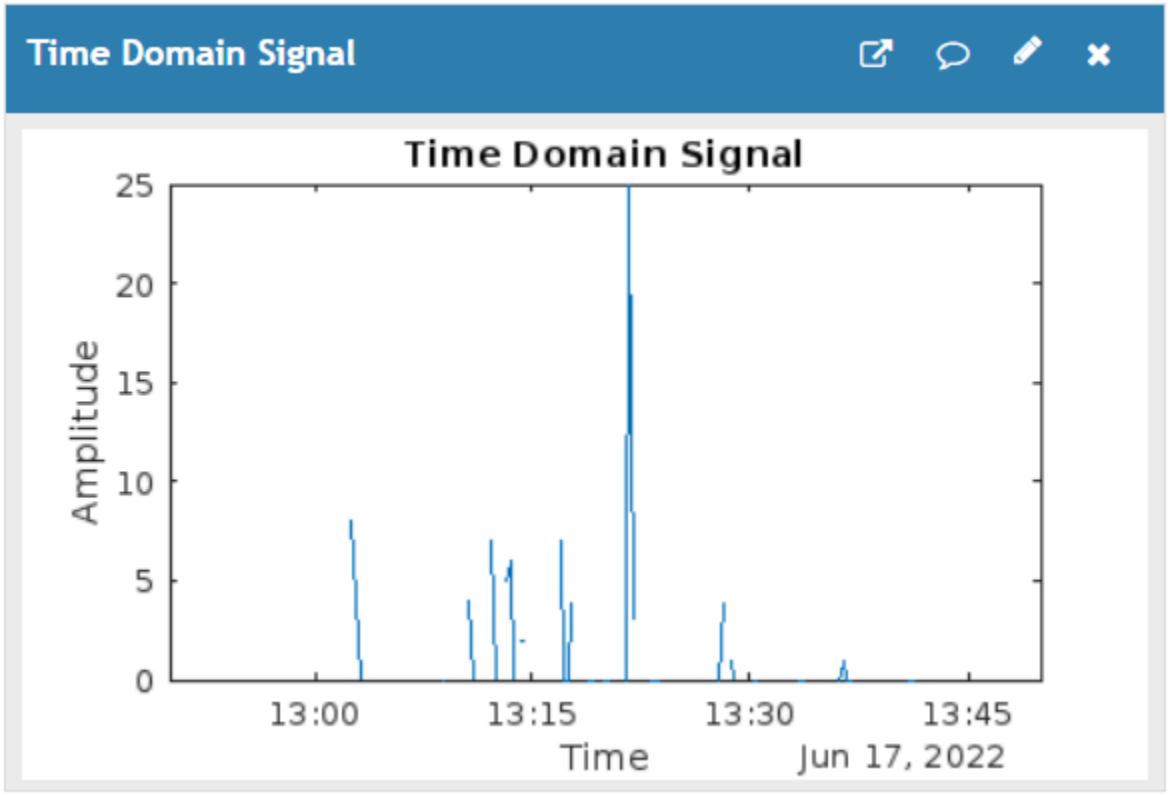
Things Speak Channel:



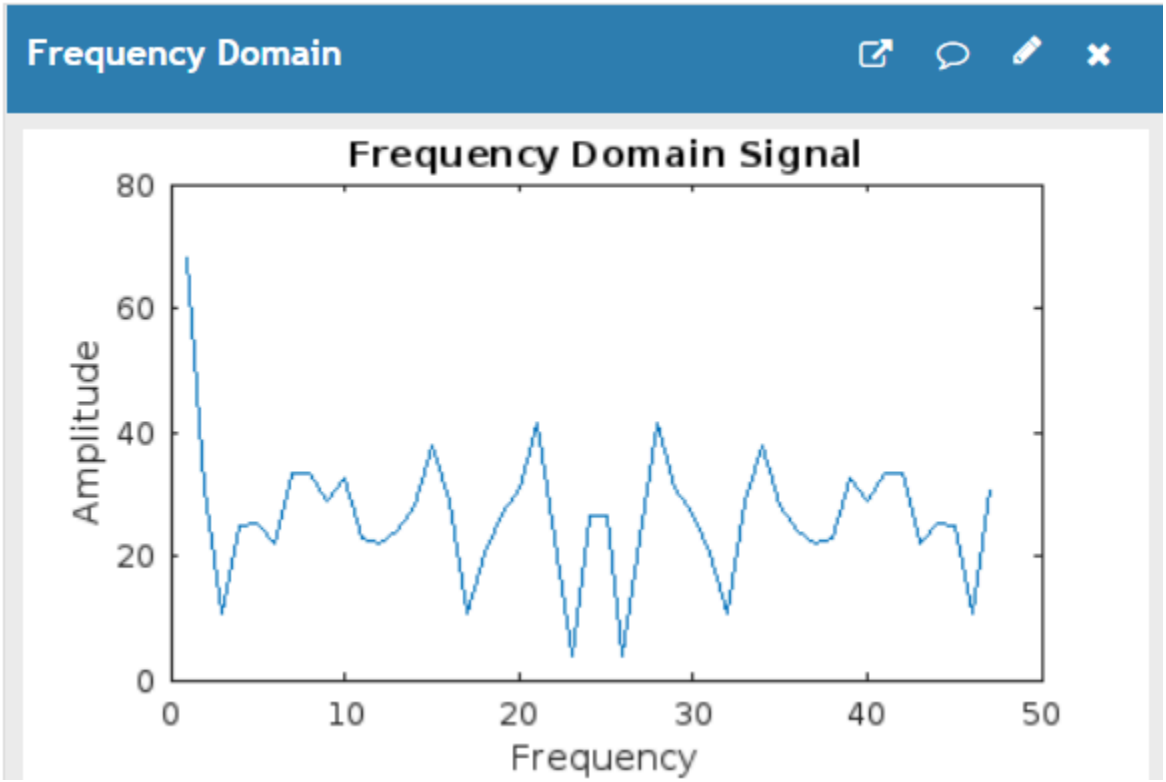
Results:



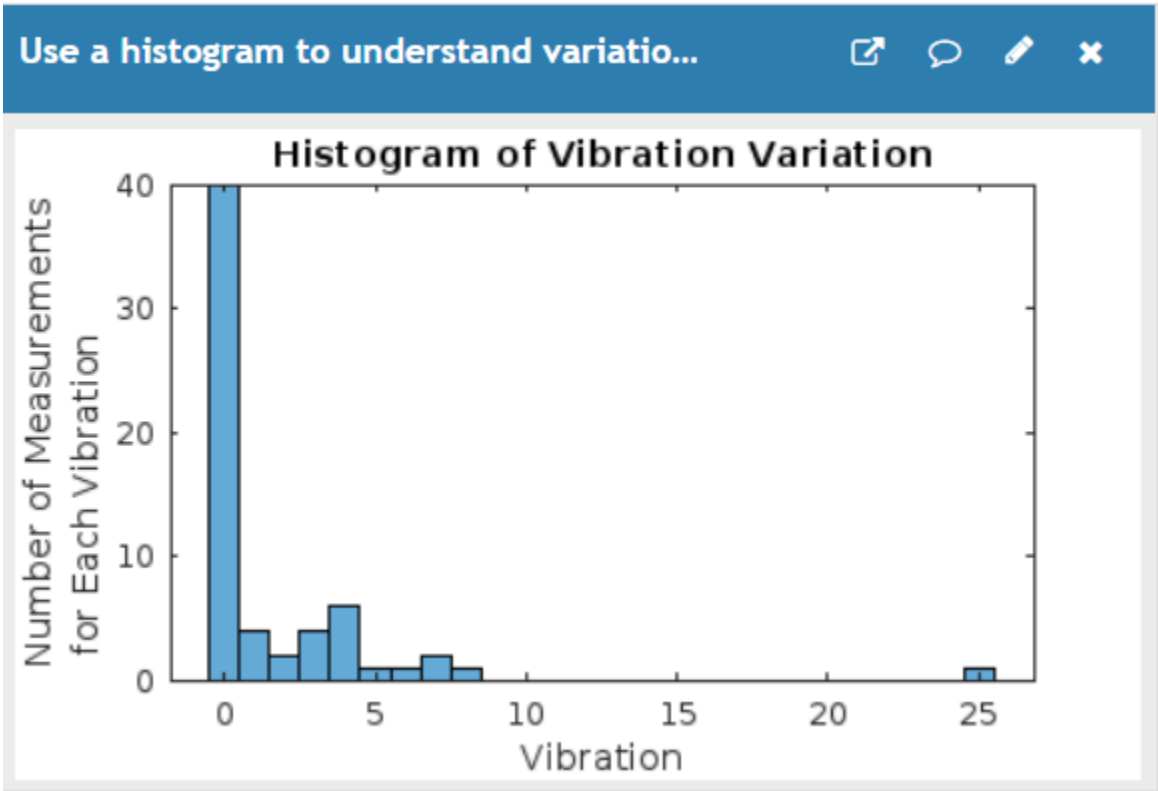
Time Domain:



Frequency Domain:



Histogram:



Other Statistical Features:

```
% Enter your MATLAB Code below

readChannelID = 1769579;
% TODO - Replace the [] with the Field ID to read data from:
fieldID1 = 5;
% TODO - Replace the [] with the Field ID to read data from:


% Channel Read API Key
% If your channel is private, then enter the read API
% Key between the '' below:
readAPIKey = 'N709T4P6VQ1UEU2S';

%% Read Data

% Read first data variable
data1 = thingSpeakRead(readChannelID, 'Field', fieldID1, 'NumPoints',
30, 'ReadKey', readAPIKey);
```

```
t = rmmissing(data1)
m = mean(t)
m1 = max(t)
m2 = min(t)
r1 = range(t)
k = kurtosis(t)
rm = rms(t)
variance = var(t)
sk = skewness(t)
```

Output:

```
m =

    0.1667


m1 =

     1


m2 =

     0
```

Output

```
r1 =

     1


k =

    4.2000


rm =

    0.4082
```

Output

```
variance =

    0.1515


sk =

    1.7889
```