

Sveiflumælingakerfi í python.

Skjákerfið notar wxpython.

Það fyrsta sem þarf að gera er að ná í þá modula sem við notum:

```
python -m pip install wxpython
```

osfr.

```
# -*- coding: utf-8 -*-  
"""
```

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```
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"""
```

```
import wx  
import math  
import numpy as np  
import matplotlib.pyplot as plt  
import csv  
from scipy import fftpack as sc
```

Byrjum á því að skilgreina rammann

```
class MyFrame(wx.Frame):  
    def __init__(self, parent, title):  
        super(MyFrame, self).__init__(parent, title =title, size = (600,400))  
        self.panel = MyPanel(self)
```

Skilgreinum samskiptakerfið

```
class MyPanel(wx.Panel):  
    def __init__(self, parent):  
        super(MyPanel, self).__init__(parent)
```

Hnappar til að velja Hanning eða flattop

```
        self.rb1 = wx.RadioButton(self, label = "Flat Top", pos = (100,300), style = wx.RB_GROUP)  
        self.rb2 = wx.RadioButton(self, label="Hanning", pos=(100, 320))
```

Titill (önnur fontastærð)

```
        self.label = wx.StaticText(self, label = "Sveiflugreiningarkefi", pos = (140,30))  
        font = wx.Font(16, wx.FONTFAMILY_ROMAN, wx.FONTSTYLE_NORMAL,  
wx.FONTWEIGHT_NORMAL)  
        self.label.SetFont(font)
```

Aðgerðarhnappar

```
        self.btn = wx.Button(self, label='Innlestur', pos = (200,70))  
        self.btn = wx.Button(self, label='Mæling', pos = (200,175))  
        self.btn = wx.Button(self, label='Vista', pos = (200,240))  
        self.btn = wx.Button(self, label='Tímaháð merki', pos = (200,280))  
        self.btn = wx.Button(self, label='FFT greining', pos = (200,310))
```

Skýringartextar

```
        self.label = wx.StaticText(self, label = "Söfnunartíðni:", pos = (60,120))  
        self.label = wx.StaticText(self, label = "Fjöldi mæligilda:", pos = (60,150))  
        self.label = wx.StaticText(self, label = "Skrá:", pos = (60,215))
```

Innlestrarlínur

```
self.text_ctrl1 = wx.TextCtrl(self, pos = (200,120), size = (150,20))
self.text_ctrl2 = wx.TextCtrl(self, pos = (200,150), size = (150,20))
self.text_ctrl3 = wx.TextCtrl(self, pos = (200,215), size = (150,20))
```

Tengja aðgerðarhnappa við aðgerðir def

```
self.Bind(wx.EVT_BUTTON, self.Button)
self.Bind(wx.EVT_RADIOBUTTON, self.onRadioButtons)
```

Aðgerð sem les valhnappanna

```
def onRadioButtons(self, e):
    rb = e.GetEventObject()
    print("Radiobutton: ",rb.GetLabel())
    if rb.GetLabel() == "Flat Topp": radiobutt = 1
    if rb.GetLabel() == "Hanning": radiobutt = 2
```

Aðgerðir til að vinna úr valmyndinni

```
def Button(self, e):
    global yA
    bu = e.GetEventObject()
    print("Button: ",bu.GetLabel())
```

Opna mæliskrá

```
if bu.GetLabel() == "Innlestur":
    frame = wx.Frame(None, -1, 'win.py')
    frame.SetSize(0,0,200,50)
```

Create open file dialog

```
openFileDialog = wx.FileDialog(frame, "Opna mæliskrá", "", "",
    "CSV skrá (*.csv)|*.csv",
    wx.FD_OPEN | wx.FD_FILE_MUST_EXIST)

openFileDialog.ShowModal()
print(openFileDialog.GetPath())
yA = np.genfromtxt(openFileDialog.GetPath(),delimiter=';')
self.text_ctrl1.SetValue("100")
self.text_ctrl2.SetValue("200")
openFileDialog.Destroy()
```

Mæliaðgerð (mælingin er tilbúin enn nemi)

```
if bu.GetLabel() == "Mæling":
```

Sækja söfnunartíðni og fjölda mæligilda

```
fs = int(self.text_ctrl1.GetValue())
Nm = int(self.text_ctrl2.GetValue())
print(self.text_ctrl1.GetValue())
print(self.text_ctrl2.GetValue())
T = 1/fs
ts = np.linspace(0.0, Nm*T, Nm, endpoint=False)
```

Mæling er með einum nema

```
w1 = 35.0*2.0*np.pi*ts
w2 = 50.0*2.0*np.pi*ts
```

```

w3 = 80.0*2.0*np.pi*ts
Am1 = 1.0
Am2 = 0.8
Am3 = 0.2
yA = np.array([Am1*np.sin(w1) + Am2*np.sin(w2)+Am3*np.sin(w3)])
plt.plot(ts,yA)
plt.grid()
plt.xlabel("Tími [s]")
plt.ylabel("Hröðun [m/s^2] ")
plt.show()

```

FFT greining með Flat Top eða Hanning glugga

```

if bu.GetLabel() == "FFT greining":
    fs = int(self.text_ctrl1.GetValue())
    Nm = int(self.text_ctrl2.GetValue())
    T = 1/fs
    wt = 2*np.pi*np.linspace(0.0, 1.0, Nm)
    if radiobutt == 1:
        win = 1-1.93*np.cos(wt)+1.29*np.cos(2*wt)-0.388*np.cos(3*wt)+0.0322*np.cos(4*wt)
    if radiobutt == 2:
        win = 1 - np.cos(wt)
    yf = sc.fft(yA*win)
    yFA = 2.0/Nm * np.abs(yf[0:Nm//2])
    xf = sc.fftfreq(Nm, T)[:Nm//2]
    plt.plot(xf,yFA)
    plt.grid()
    plt.xlabel("Tíðni [Hz]")
    plt.ylabel("Hröðun [m/s^2] ")
    plt.show()

```

Teikna tímaháða merkið

```

if bu.GetLabel() == "Tímaháð merki":
    fs = int(self.text_ctrl1.GetValue())
    Nm = int(self.text_ctrl2.GetValue())
    T = 1/fs
    ts = np.linspace(0.0, Nm*T, Nm, endpoint=False)
    plt.plot(ts,yA)
    plt.grid()
    plt.xlabel("Tími [s]")
    plt.ylabel("Hröðun [m/s^2] ")
    plt.show()

```

Vist amælinginuna (athugið að það á einnig að vista fs og N)

```

if bu.GetLabel() == "Vista":
    fs = int(self.text_ctrl1.GetValue())
    Nm = int(self.text_ctrl2.GetValue())
    filename = self.text_ctrl3.GetValue()
    print(filename)
    ySave = np.reshape(yA, Nm)
    np.savetxt(filename, ySave, delimiter=";")

```

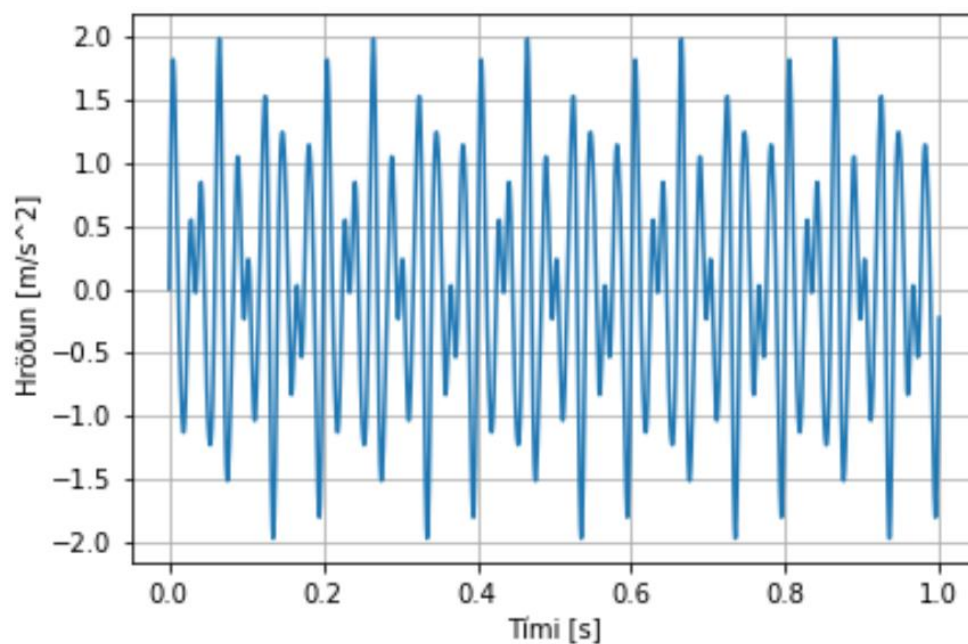
Aðalaðgerðin

```
class MyApp(wx.App):  
    def OnInit(self):  
        self.frame = MyFrame(parent=None, title="Sveiflumælingar")  
        self.frame.Show()  
        return True  
radiobutt = 1  
app = MyApp()  
app.MainLoop()
```

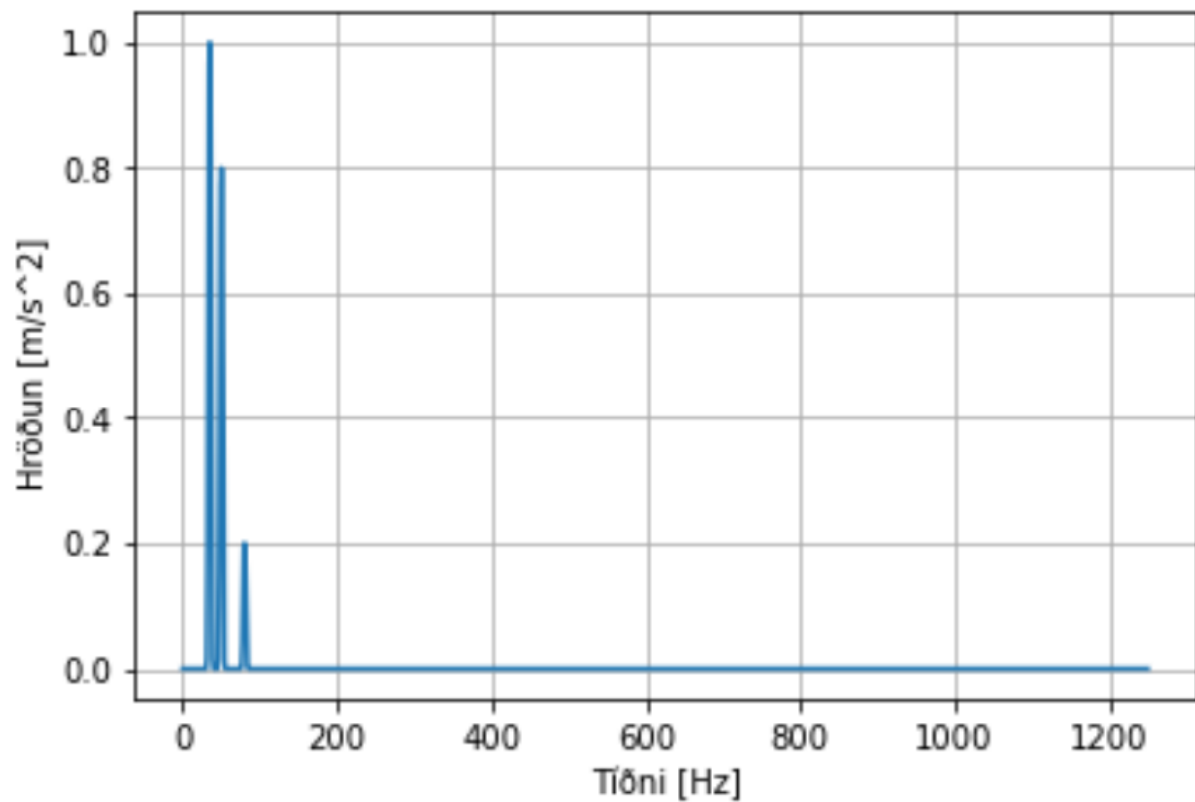
Notkun:

Skrá inn söfnunartíðni og fjölda mæligilda

Ýta á mæla



Velja gluggun og ýta FFT greining



Gefa upp skráarnafn og vista:

Sveiflumælingar

Sveifflugreiningarkefi

Innlestur

Söfnunartíðni: 2500

Fjöldi mæligilda: 2500

Mæling

Skrá: M01.csv

Vista

Tímaháð merki

Flat Top

☒ Hanning

FFT greining

Sækja skránnu og skoða FFT.