Building a GUI in python to interface with MPA testing

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Overview

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- Work to do
- Methods

Abstract

A GUI, or a graphical user interface is a form of user interface that allows users to interact with other electronic devices through graphical ions and audio indicators. Building this GUI for MaPSA testing in python is critical for the USCMS HL-LHC Outer Tracker Upgrade and allows the performance goal of this research to be attained. Once completed, novice student researchers should be able to conduct their own studies using the code shortcuts created in python.
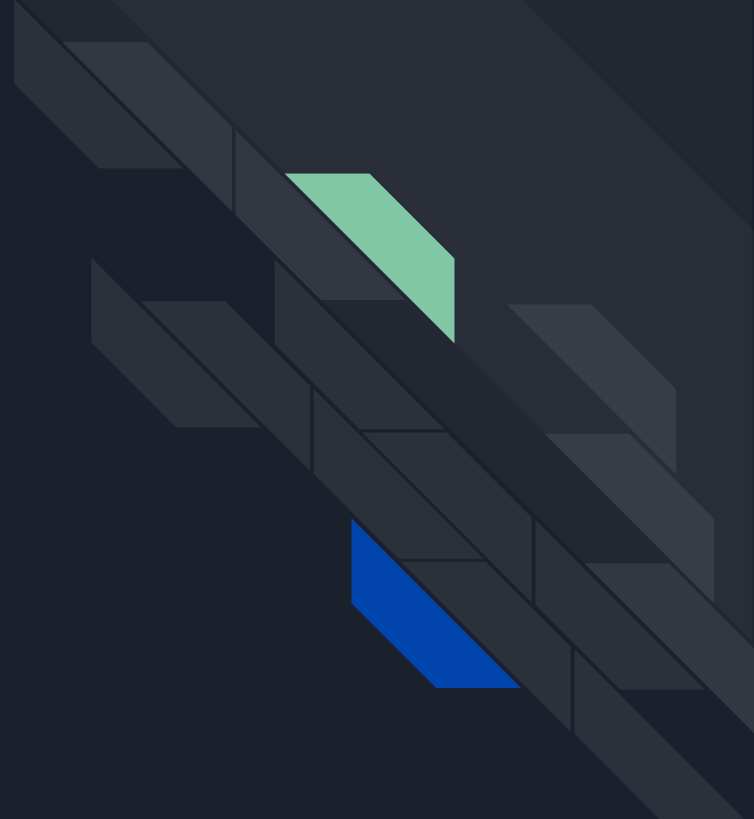
Method

01

- Tkinter
  - De facto GUI Python interface
  - Combined with Python to create a faster and easier way to actually create GUI applications
  - Learn how to utilize Tkinter to create a code shortcut that can be used by novice researchers


```python
year_names= []
with open(filename, 'r') as baby_file:
    lines = baby_file.readlines()
    for line in lines:
        if '<h3 align="center">Popularity' in line:
            year = re.search('(\d{4})', line)
            print(year.group(0))
            continue

        rank_info = re.search('<td>(\d+)</td><td>(\w+)</td><td>(\w+)</td>', line)
        if rank_info is not None:
            print(rank_info.group(0))
            rank, boy, girl = rank_info.group(1), rank_info.group(2), rank_info.group(3)
            year_names.extend([boy + ' ' + rank,
                               girl + ' ' + rank])

extract_names = [year] + sorted(year_names)
print(extracted_names)

extract_names('baby1990.html')
```

Work to do

- Create a code shortcut in python for novice coders to utilize
- Add functions to call methods
  - MaPSA Testing
  - Analog Pixel Test
  - Digital Pixel Test
  - Registry Test
  - Treshhold SCurve
  - HV Scanning
  - Bump Bonding
  - Etc.
- Adding plotting functionality using matplotlib

Hannsjörg's GUI code

```
try:
    import Tkinter as tk #python 2.7
    import tkMessageBox as messagebox #python 2.7
    import tkFileDialog as filedialog #python 2.7
except ImportError:
    import tkinter as tk  #python3
    from tkinter import messagebox #python 3
    from tkinter import filedialog #python 3

#import Tkinter as tk #python 2.7
#import tkinter as tk  #python3
#import tkMessageBox as messagebox #python 2.7
#from tkinter import messagebox #python 3
#import tkFileDialog as filedialog #python 2.7
#from tkinter import filedialog #python 3
import time
import decimal
import ConfigParser
import random
import sys
import os.path
import itertools
import datetime
#import logging
import numpy as np
import matplotlib
matplotlib.use('TkAgg')
from matplotlib.backends.backend_tkagg import FigureCanvasTkAgg
import matplotlib.pyplot as plt
import math
import numpy as np
from scipy.optimize import curve_fit
import matplotlib.pyplot as plt
from scipy.special import erfc
from scipy.special import erf
import matplotlib.cm as cm
#import seaborn as sns
import csv
```