

1 Task

Create a Python Module ¹ which turns an arbitrary single section filter into a comb filter.
For the creation of the GUI, use PyQt5 (see further literature)

2 Filter Demo

In general, all submitted Python files must have a header. Indicate the purpose of each file, author, date, course and literature used (if any).

Structure your demo into two files: `testcombfilter.py` and `combfilter.py`

2.1 testcombfilter.py

`testcombfilter.py`, which handles the front end, filter creation and user interaction

- designs one FIR filter of your choice
- designs one IIR filter of your choice (must be stable)
- interpolates both filter designs with your own `combfilter` function
- visualizes the filter responses of the designed filters and the comb interpolated versions
- Plots should be labeled and must have axis labeling.

2.2 combfilter.py

`combfilter.py`, holding a function with the following skeleton:

```
1 def combfilter(b,a,factor):  
2     ...  
3     return b, a
```

This function turns an arbitrary single section filter into a comb filter.

- `b`, `a`: filter coefficients
- `factor`: repetition factor of comb filter

3 Deadline and Submission

The deadline is set two weeks after the lab unit. The exact date is communicated using the Moodle LMS system.

Upload your whole module as a zip archive.

¹<https://docs.python-guide.org/writing/structure/#modules>