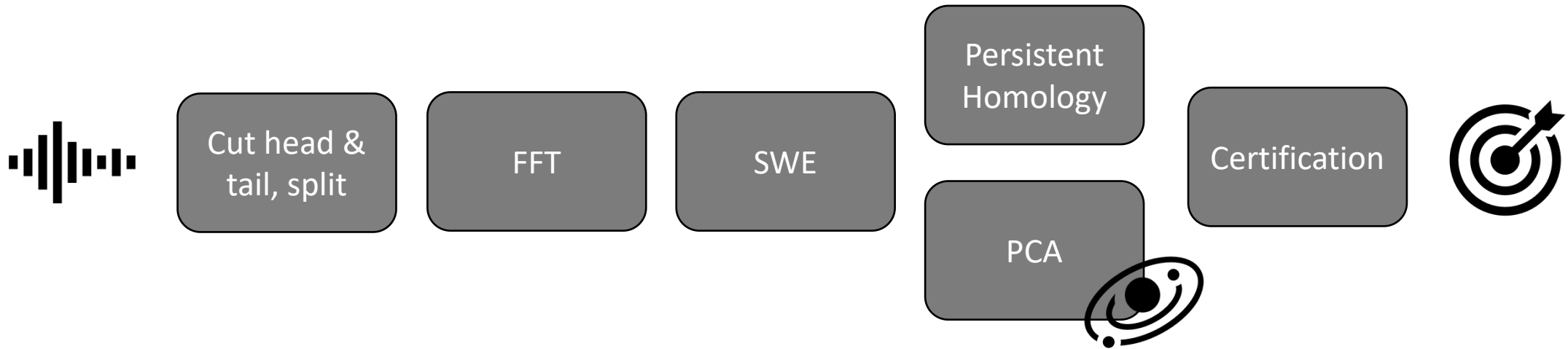


Progress Report on Phonetic Data

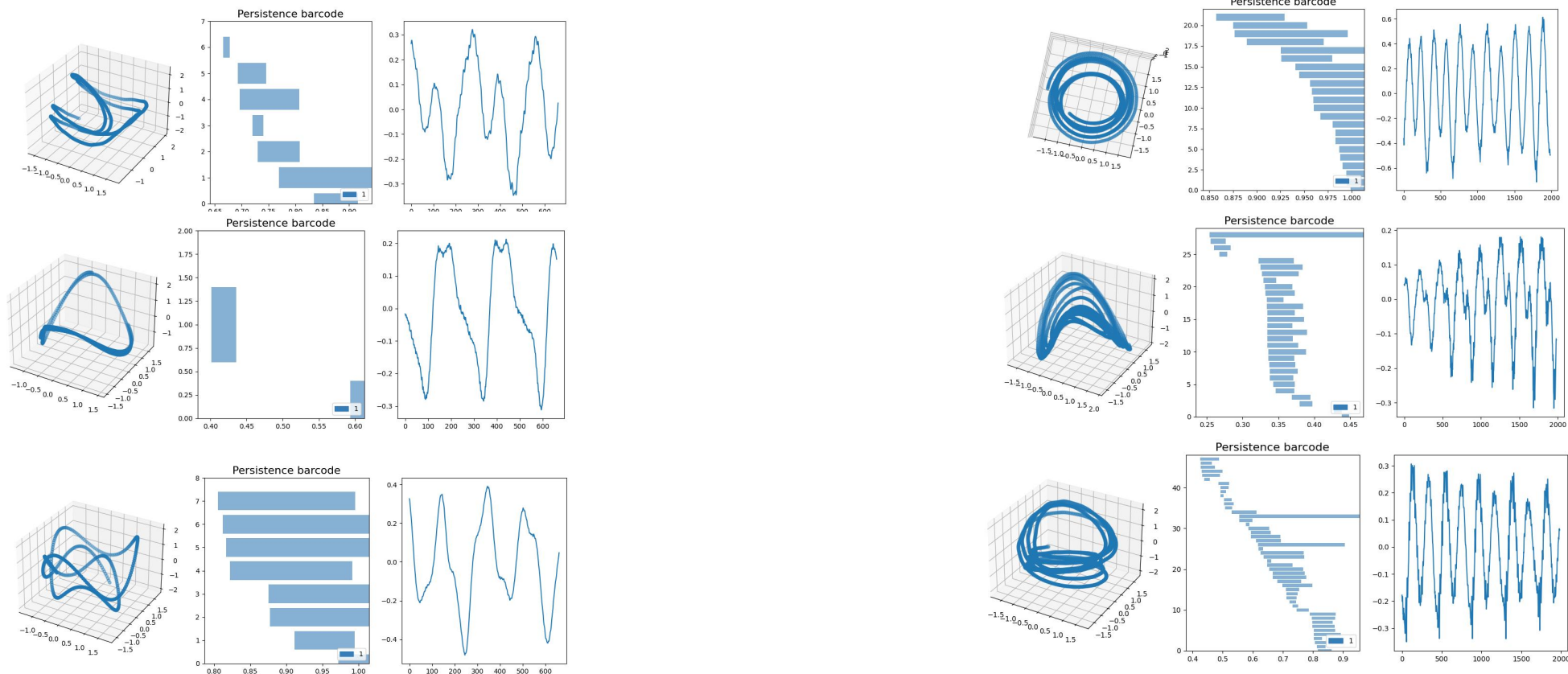
Feng PingYao

2022.9.3

Current Process



Features for Vowel

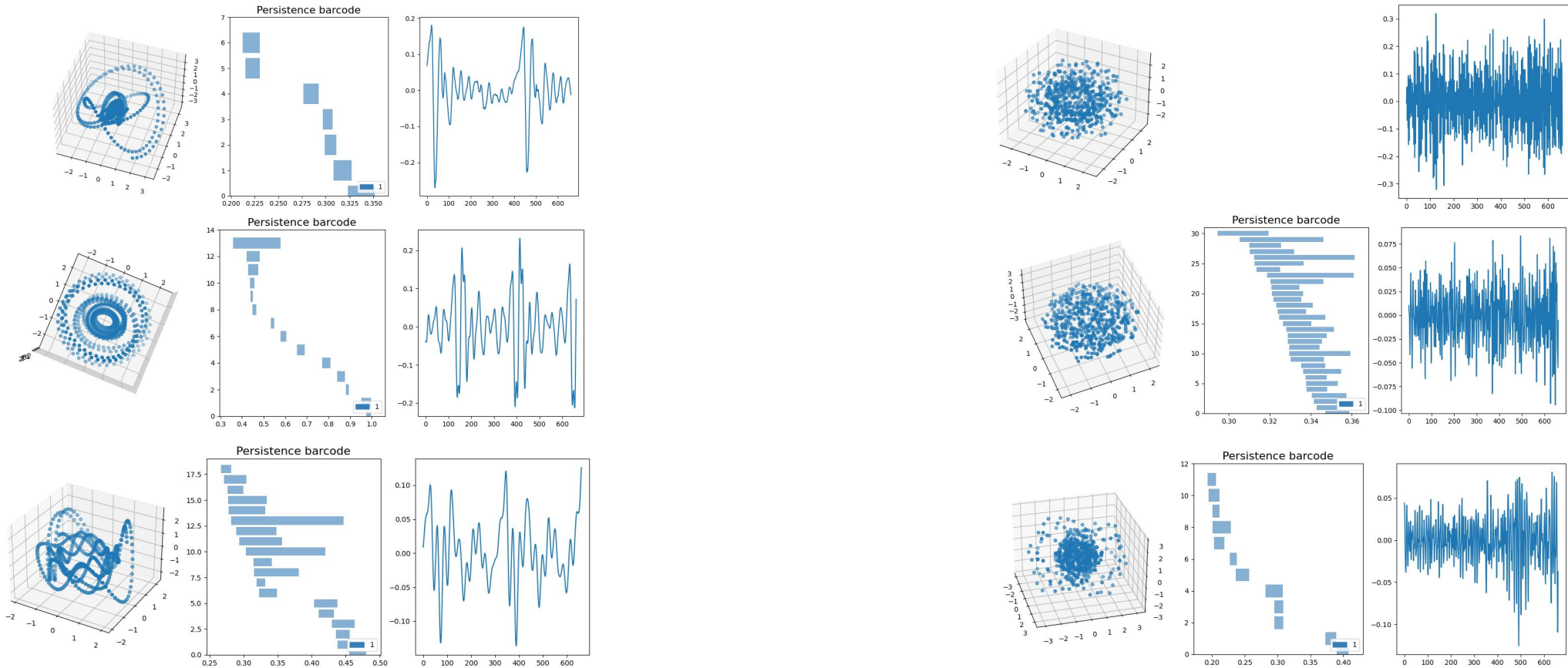


Left: frame size: 15ms, frame shift: 5ms; Right: frame size: 45ms, frame shift: 22.5ms

```
d:\python\lib\site-packages\gudhi\persistence_graphical_tools.py:210: UserWarning: Attempting to set identical left == right == 0.9398673575822177 results in singular transformations; automatically expanding.  
axes.axis([axis_start, infinity, 0, ind])
```

The problem occurs most widely in the improved frame size and frame shift

Features for Consonant



Left: pulmonic consonant; Right: non-pulmonic consonant

Normally, the barcodes of pulmonic consonants are short. The condition for non-pulmonic consonants is subtle. More precise observations on the barcode?

Obstructions & Future works

- FFT: Is this a good way to describe the 'period' of phonetic data? (There are lots of refinement needed to be done here, for example, window function)(consider autocorrelation)
- Certification: Are we going to the machine learning step? (Machine learning is not what we are good at, lots of time is needed. It may not be wise to jump into such a well-developed area. Are there any other ways?) (RF, SVM, xGboost, 信息熵)
- Improvement in the choice of parameters: more refined experiments should be made.