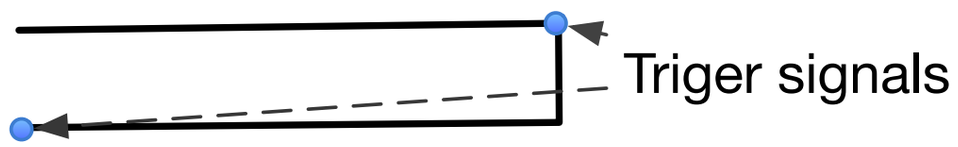
Experiment Description

Experiment Set Up

- Four pens with attached accelerometers are set in parallel onto a paper-covered glass plate
- The glass plate is moved in a given pattern under them.
- The resulting pattern is



Experiment Description

Observation Intervals:

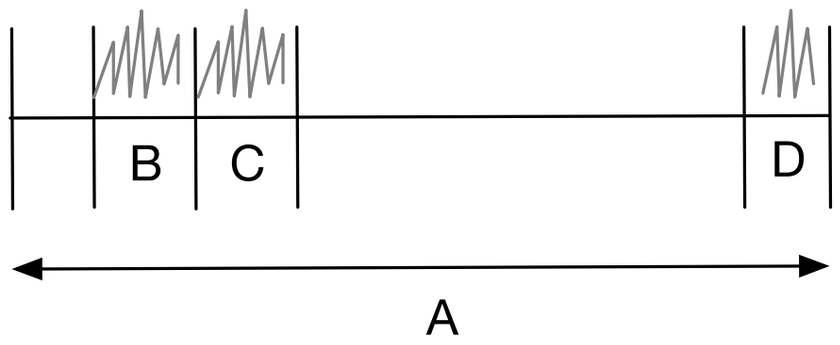
- The pattern is divided into two segments: left movement and right movement
- For each segment four ranges are considered:

A. entire range (10Hz to 12500Hz)

B. range from 500Hz to 1000Hz

C. range from 1000Hz to 1500Hz

D. range from 7500Hz to 8000Hz

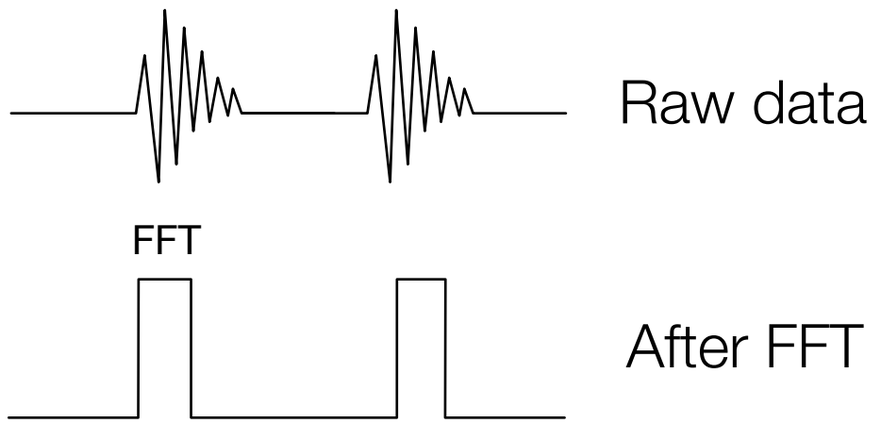


Feature Description

Each movement segment (left and right) will be converted from the time domain to frequency domain using FFT

Features for each range:

- Maximum amplitude
- Maximum "point energy“
- Position of max. amplitude frequency
- Total energy, integral over the whole range



For each movement segment (left and right):

8 combined features computed from the sum and the distance of the four measuring method over all four intervals

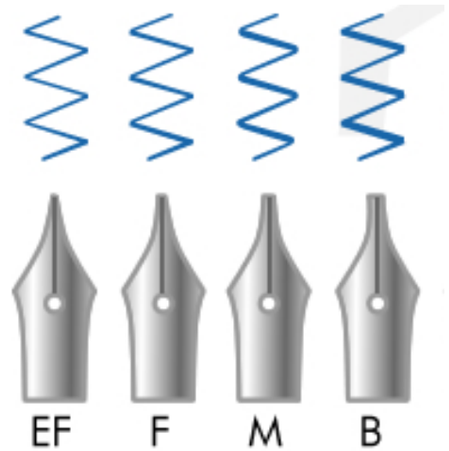
In total:

16 features for left movement, 16 features for right movement and 8 combined

Items Description

There are four pen types:

- **B** - wide (breit)
- **M** - middle (mittle)
- **F** - thin (fein)
- **EF** - extra thin (extra fein)



Source of the picture: https://www.penchalet.com

Extra:

- Each type of a pen has different behavior and different limits of the values of the features.
- During an experiment the pens of only one type are tested
- Due to mechanical influences the forces on every pen in the test machine is slightly different