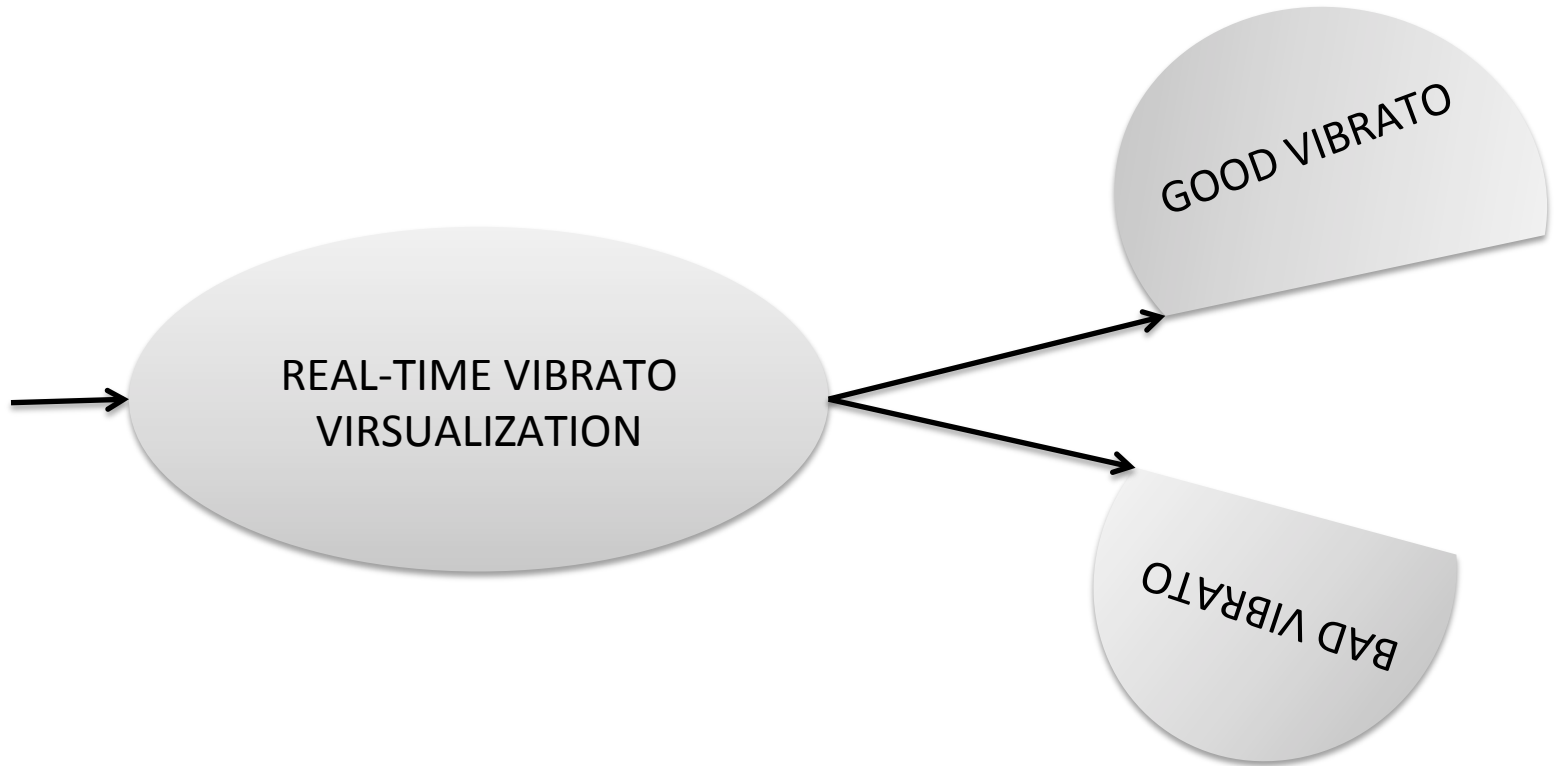


# REAL TIME NATURAL VOCAL VIBRATO TRAINING SYSTEM

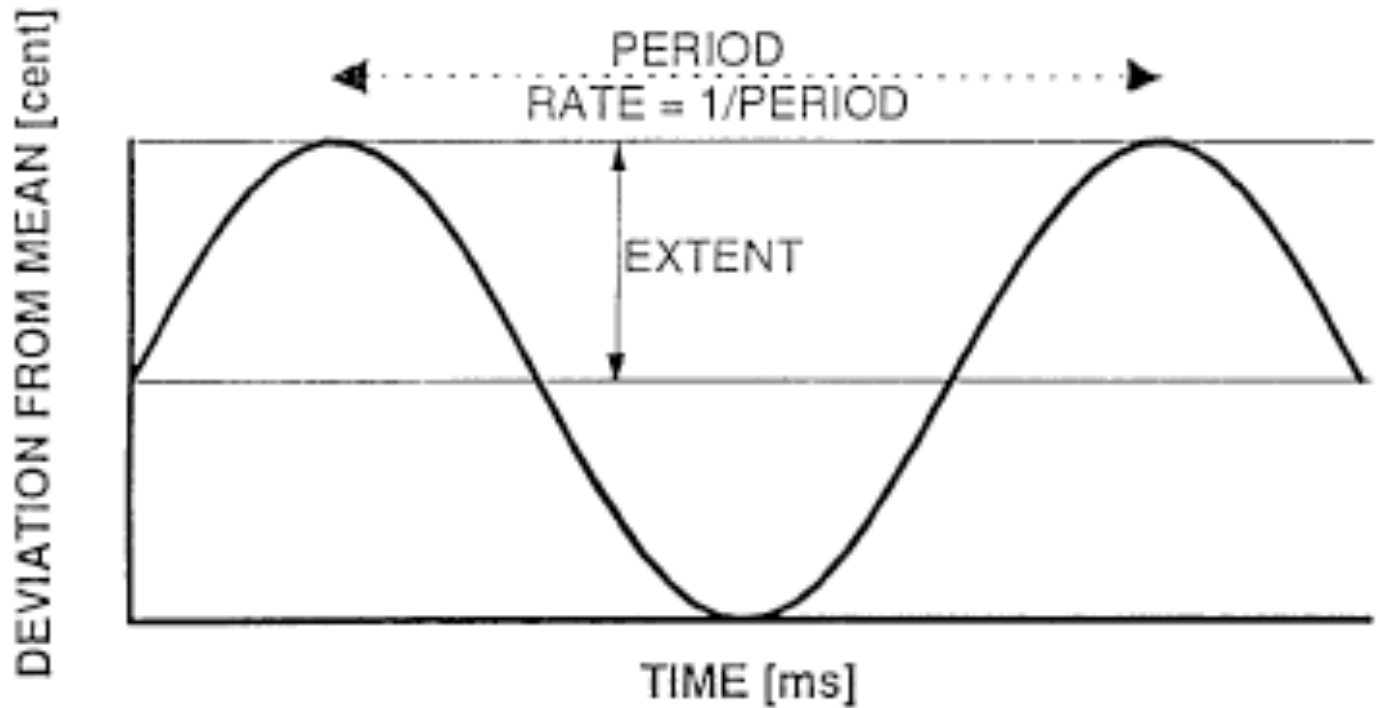
David Heid and Lei Fan

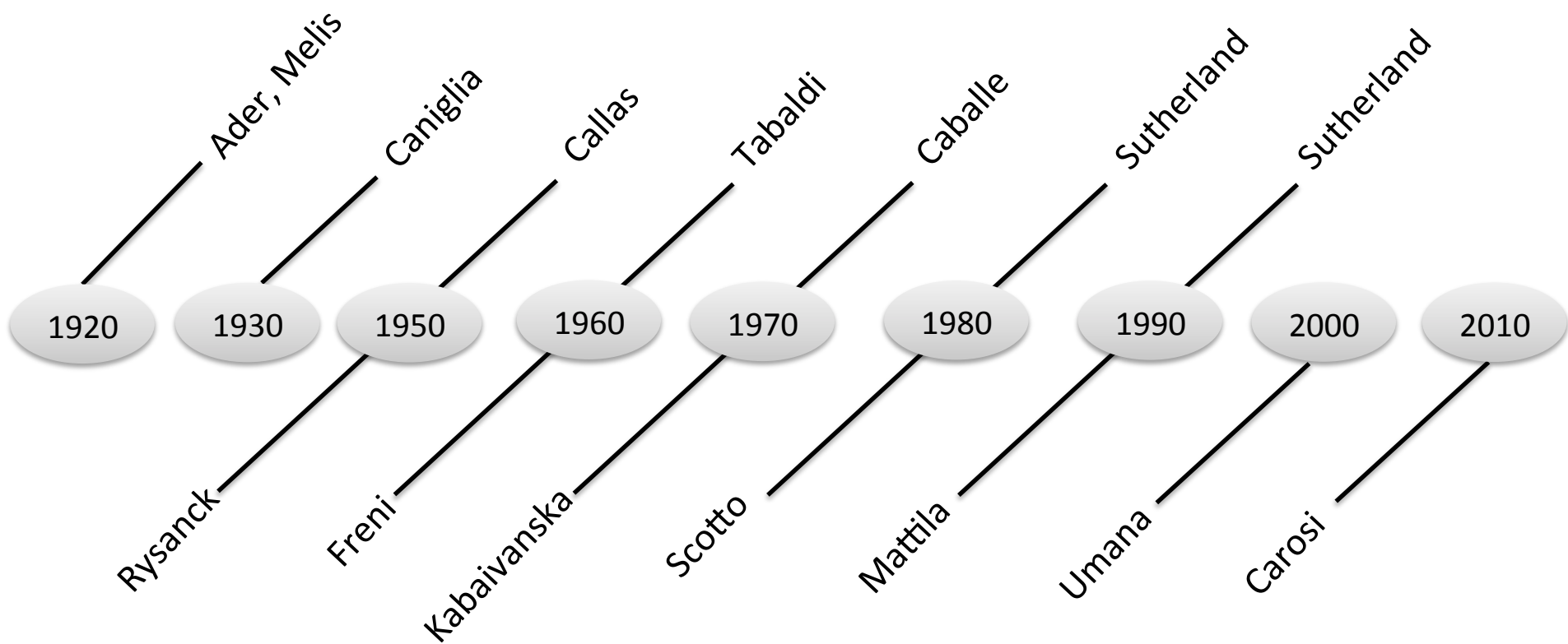
# SYSTEM OVERVIEW



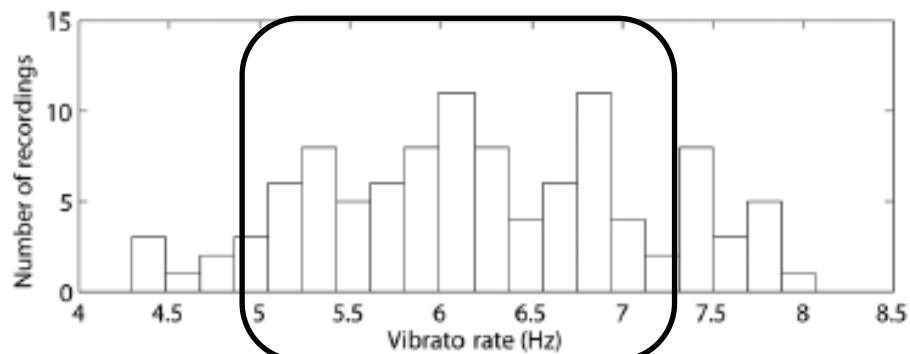


A good vibrato is a pulsation of pitch,  
usually accompanied with synchronous pulsations of loudness and timbre,  
of such extent and rate  
as to give a pleasing flexibility, tenderness, and richness to the tone.  
- Carl Seashore



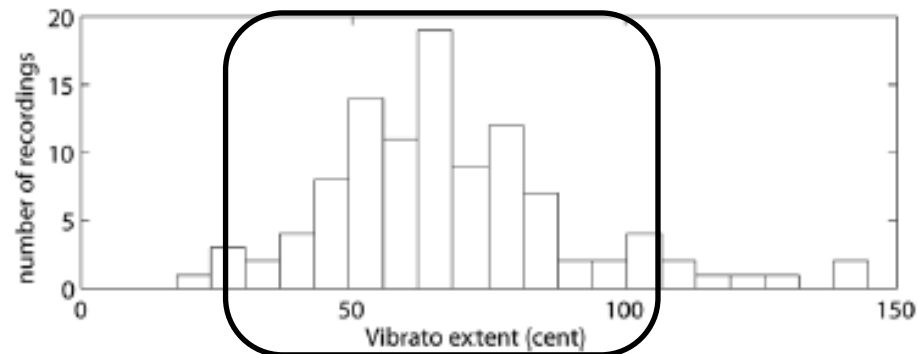


RATE DISTRIBUTION



5Hz-7 Hz

EXTENT PERCENTAGE DISTRIBUTION



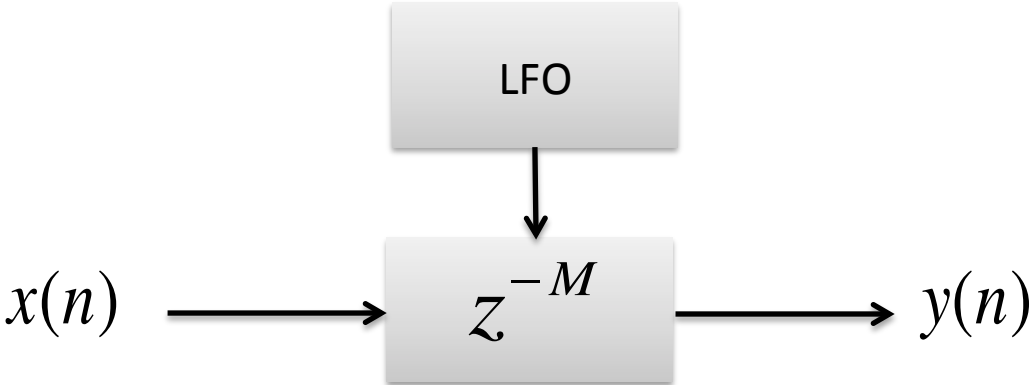
34%-110%

# QUESTIONNAIRE

- Age
- Singing time
- Voice type
- Idea on vibrato
- Idea on straight tone
- Whether vibrato is healthy

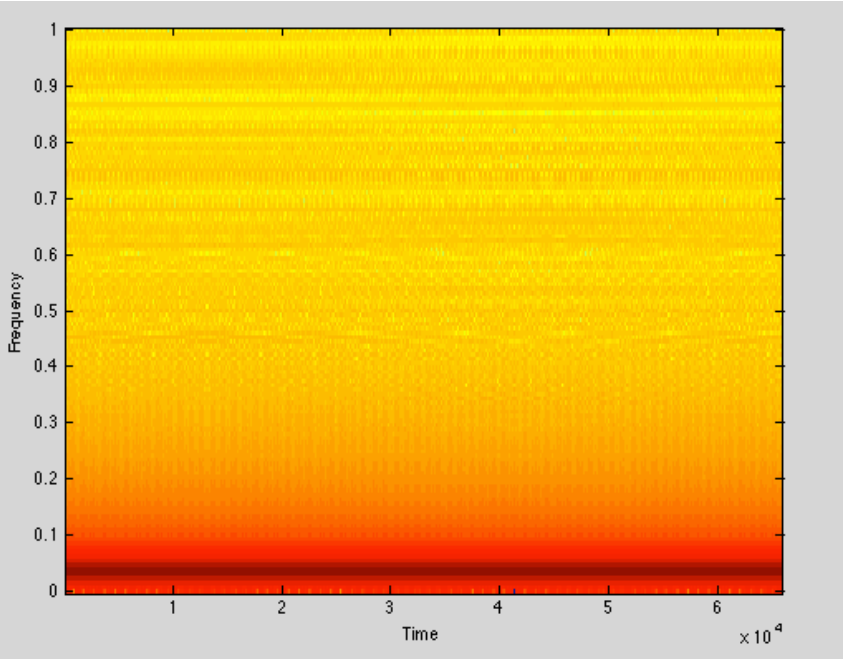


# Ideal Vibrato Implementation

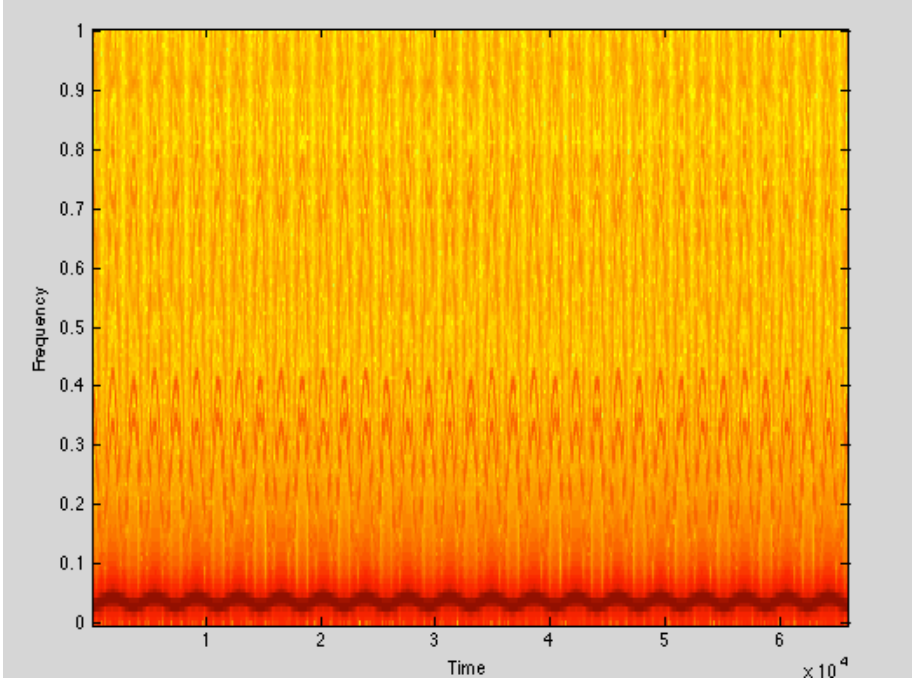


# Vibrato Spectrogram Analysis

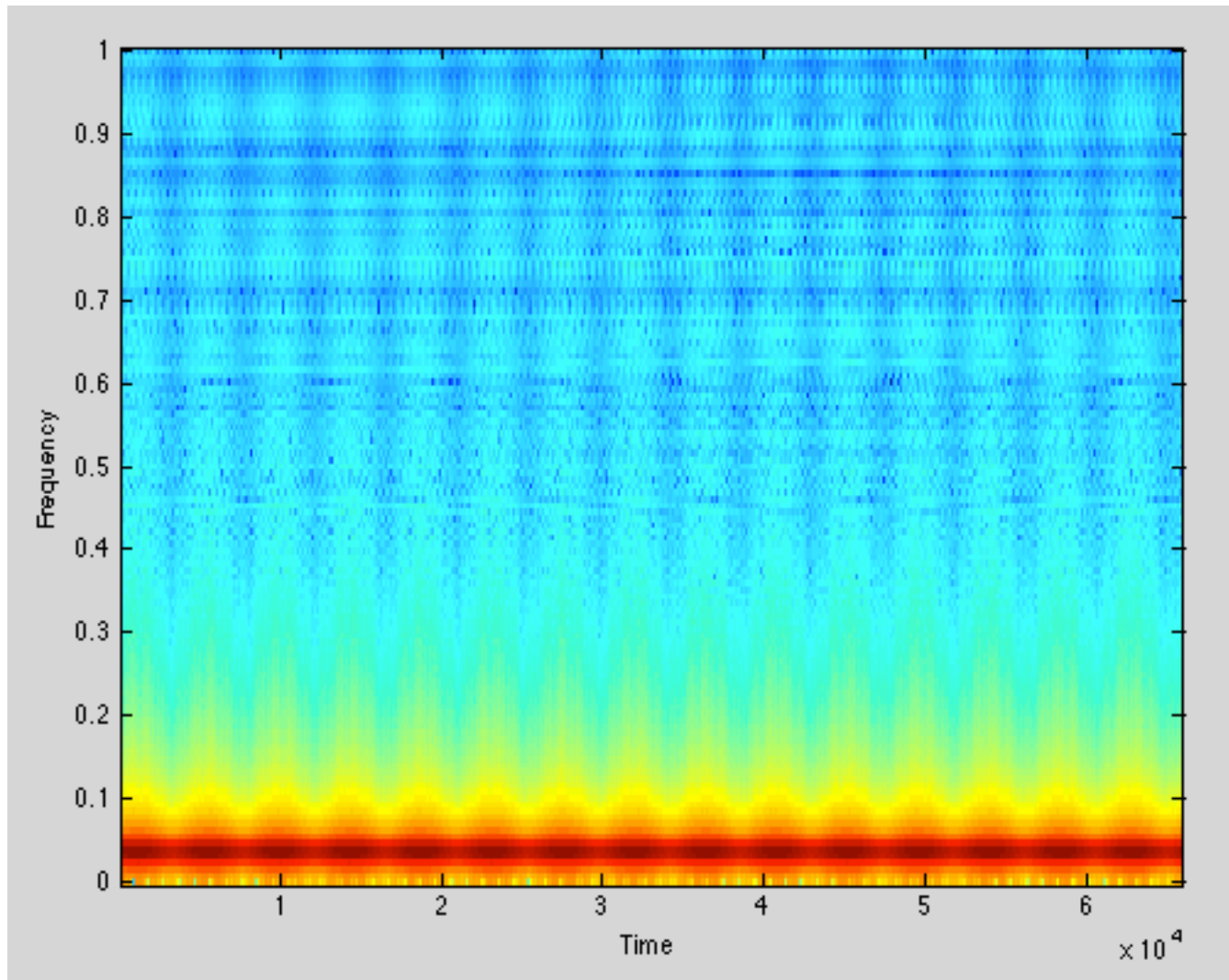
800Hz sine wave



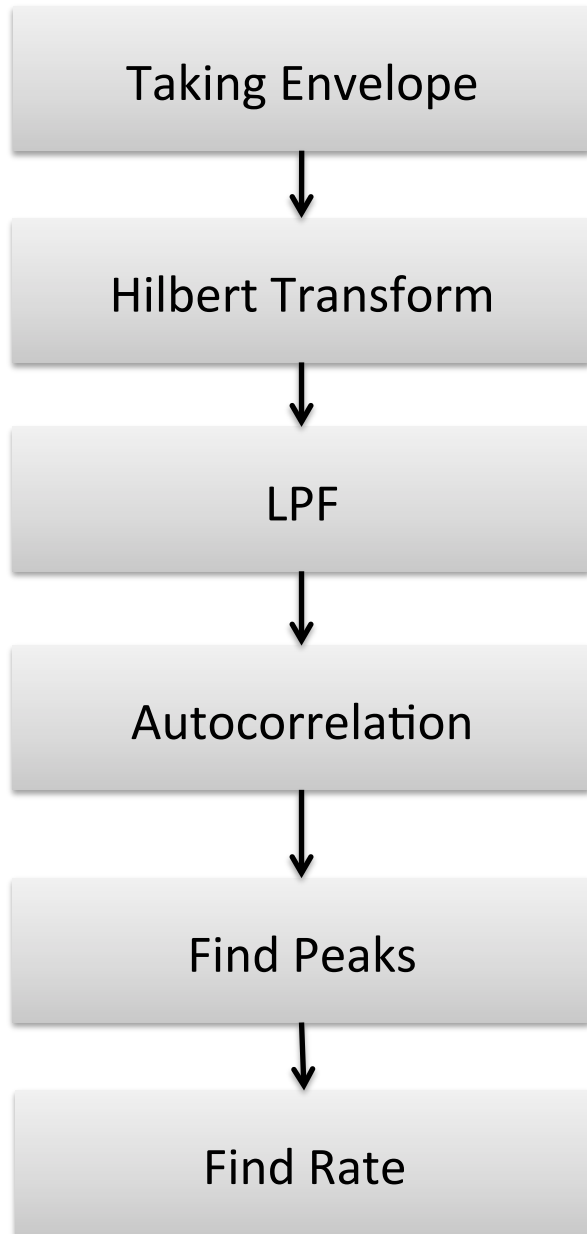
800Hz sine wave with vibrato



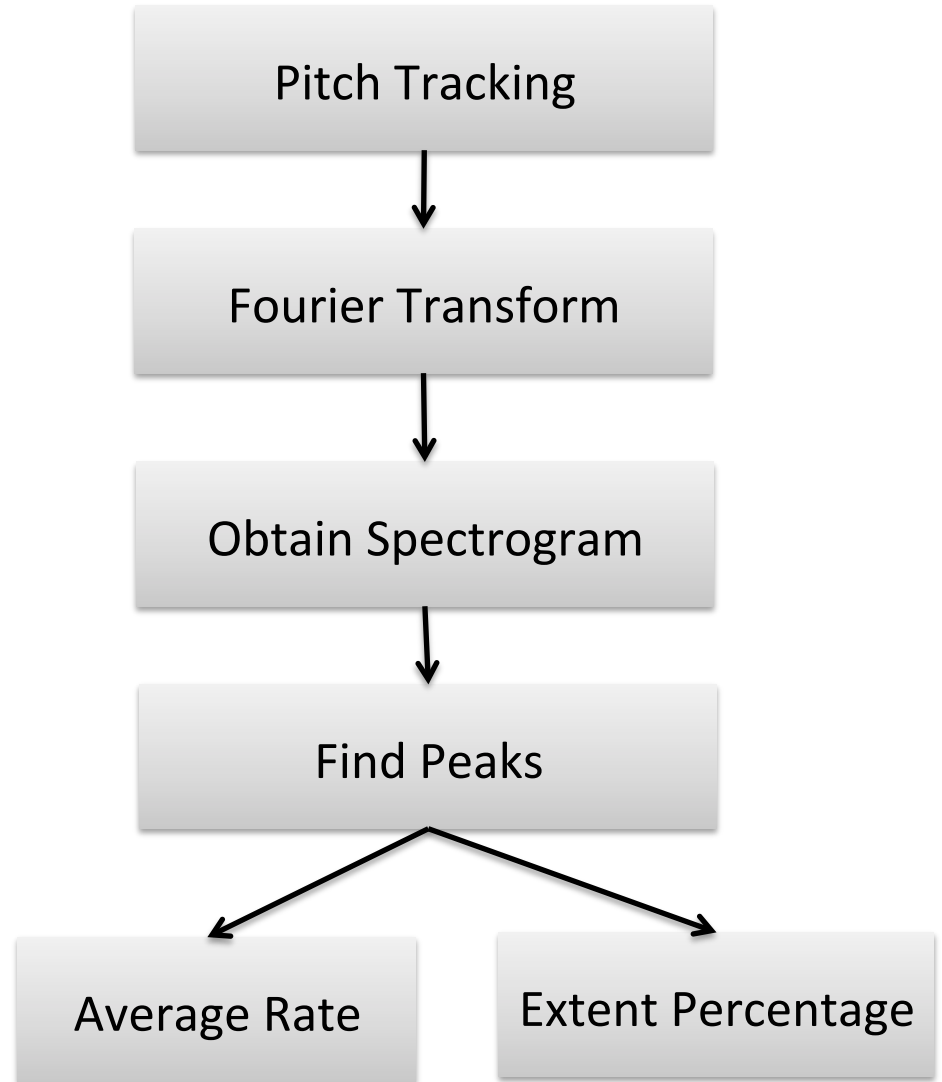




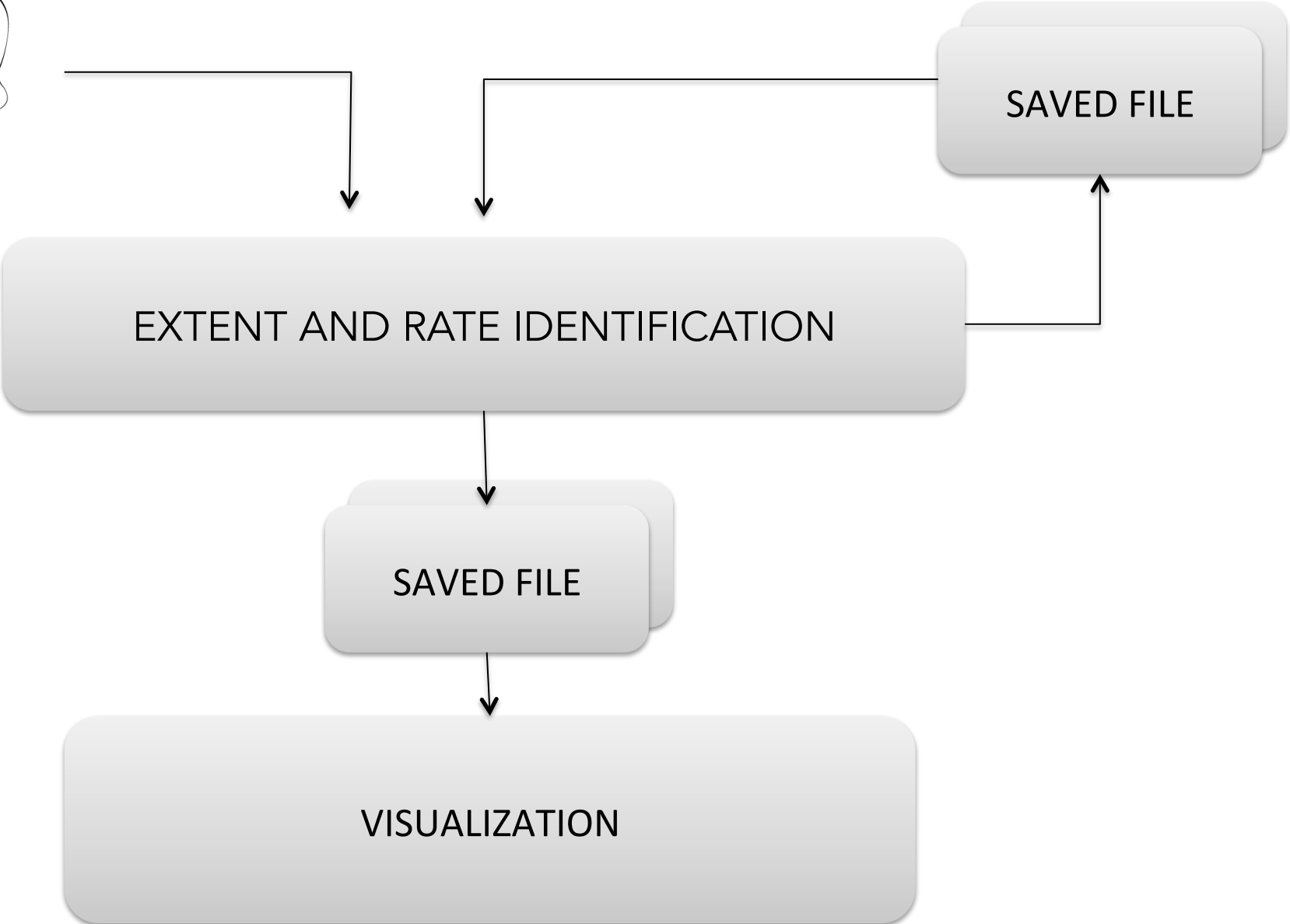
## Time Domain



## Frequency Domain



# Real Time Implementation

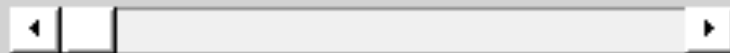


# REAL TIME VOCAL VIBRATO TRAINING SYSTEM

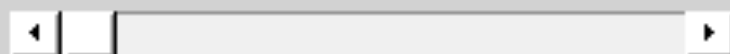
ELLIPSE



RATE



EXTENT



STOP

EXIT

# FUTURE WORK

- More Stable Model,
- Measure Vibrato Consistency,
- Give Specific Feedback, Diagnose Tension
- Create Expert-Reviewed Vibrato Questionnaire

THANK YOU