

PR077

Automatic Tuner

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Content

- Part 1 Background
- Part 2 Feature
- Part 3 Summary

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Background

Part 1 Background



Music is very popular in the world. Almost everyone like music.

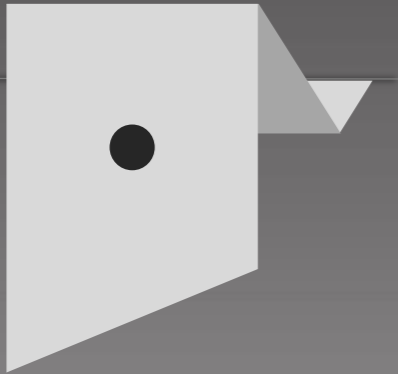


String instrument is very friendly to novices in time and money.



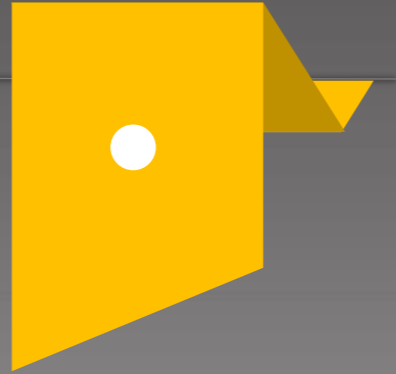
Many people admire the guitar or bass players due to handsome performance.

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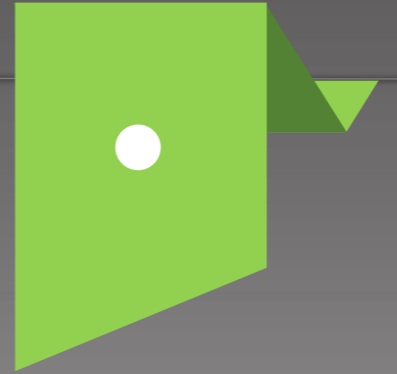
Big Deviation

General tuner can't work with high accuracy.



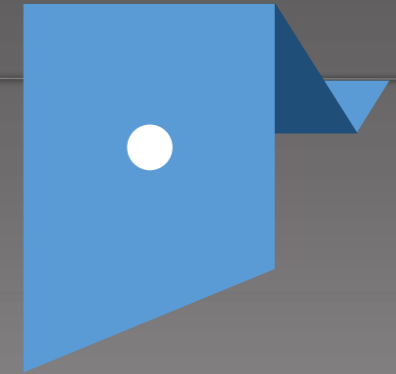
Manual Adjustment

We can only tighten or loosen a string with the knob at the guitar bridge by our own hand.



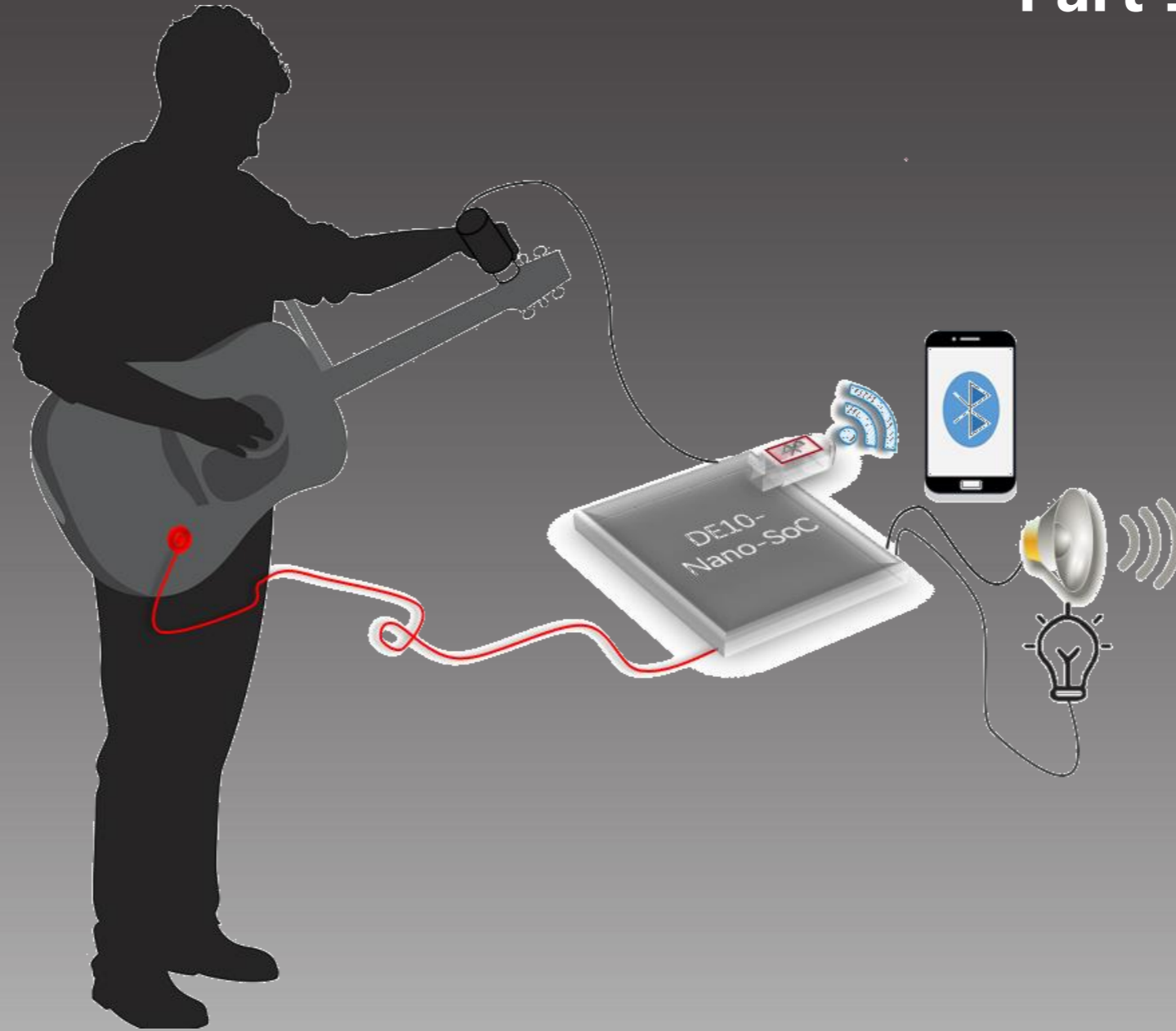
Need Musical Knowledge

The tuner just offer the message about current pitch. So it's difficult to understand if you lack musical knowledge



Need Experience

Novices can't handle the relationship between pitch difference and screwing difference.



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Features

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01

- Automatic Tuning

02

- Customize Tuning

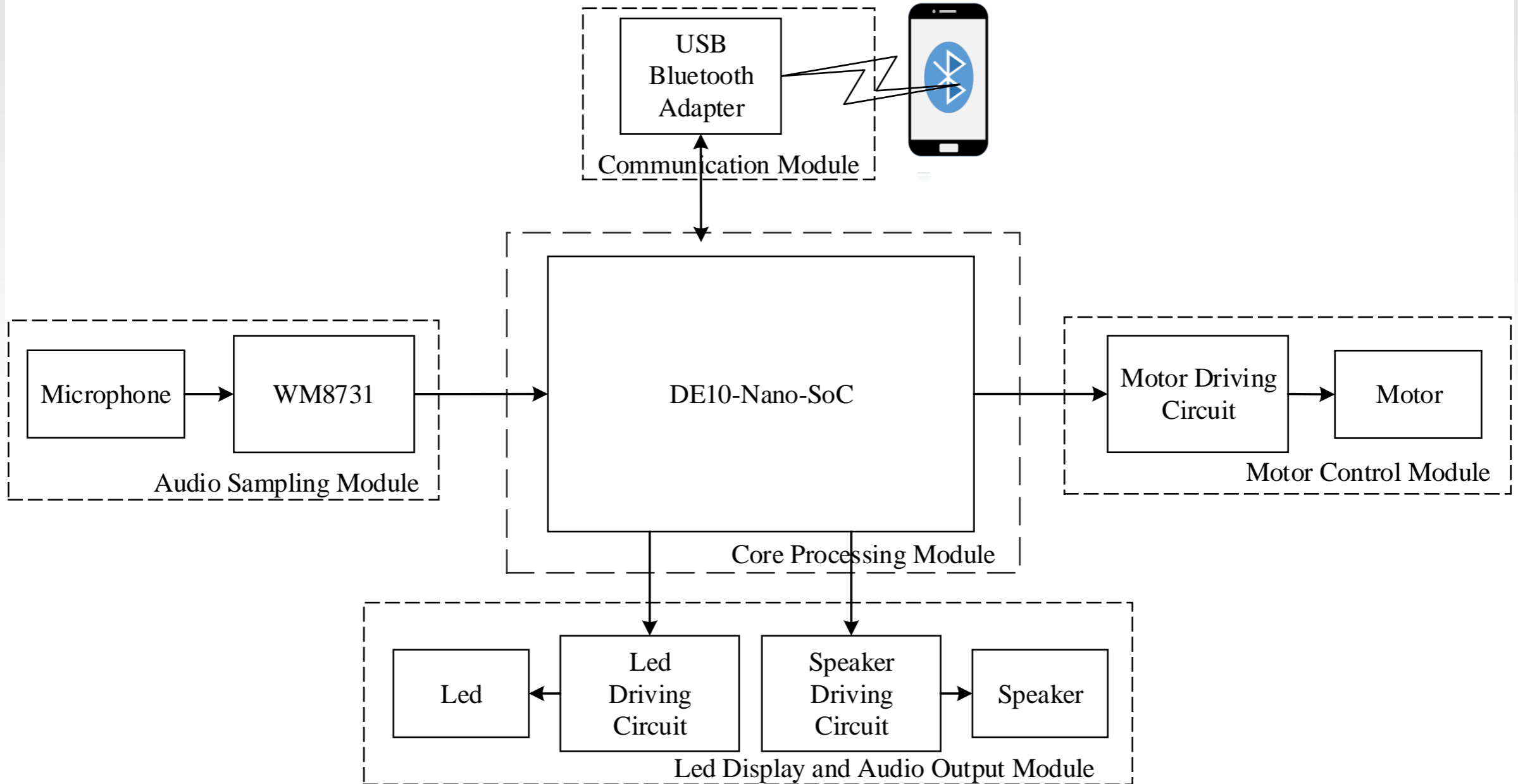
03

- Metronome

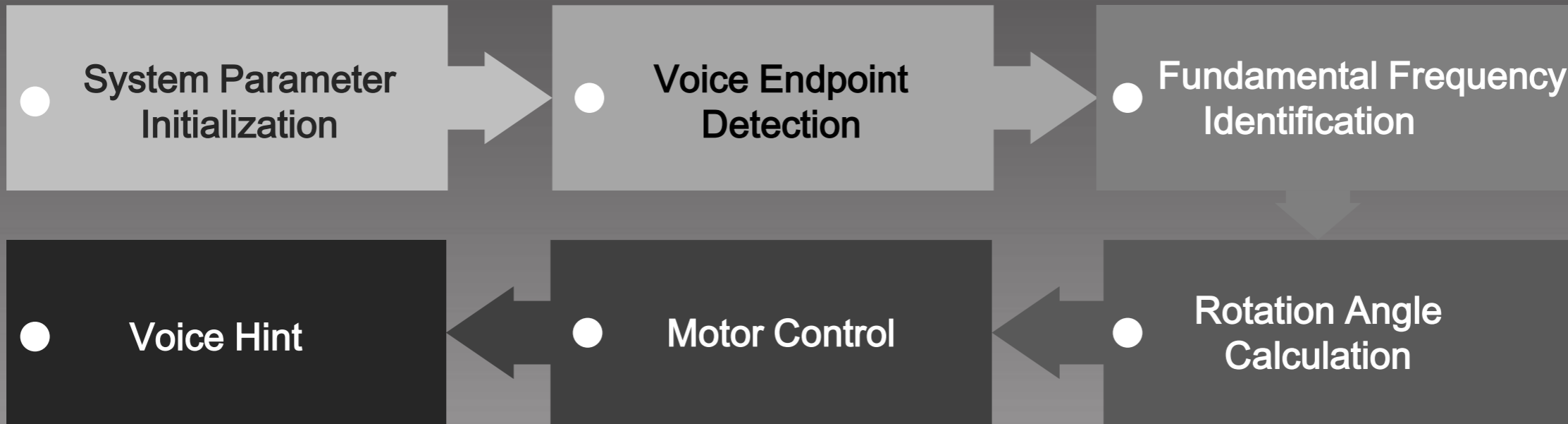
- Evaluate String Instrument

04

Part 2.1 Automatic Tuning



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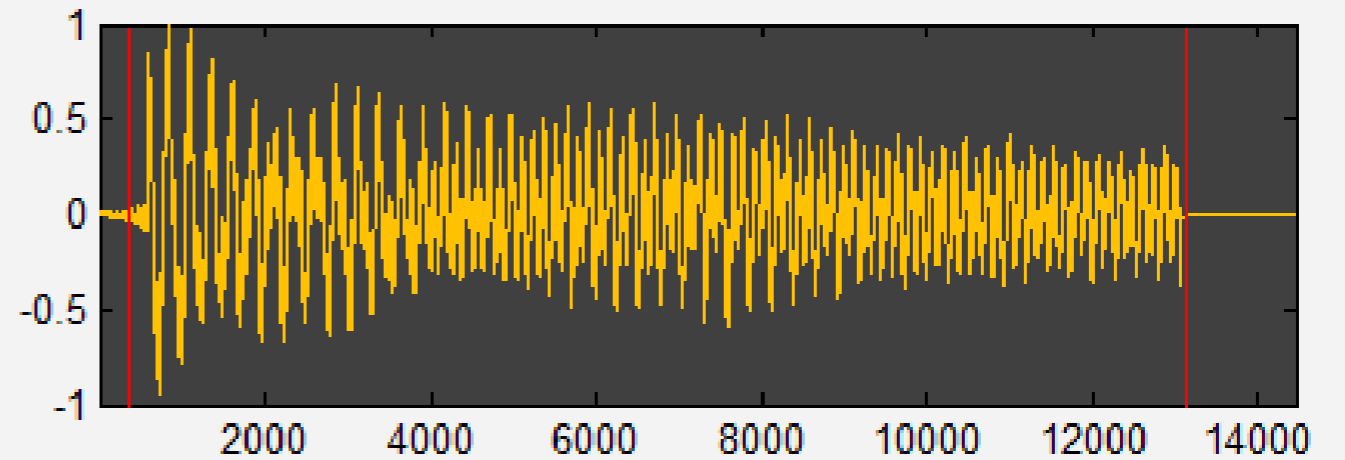
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Voice endpoint detection

Short-term Average Amplitude

$$M_n = \frac{\sum_{m=0}^{N-1} |x_n(m)|}{N}$$

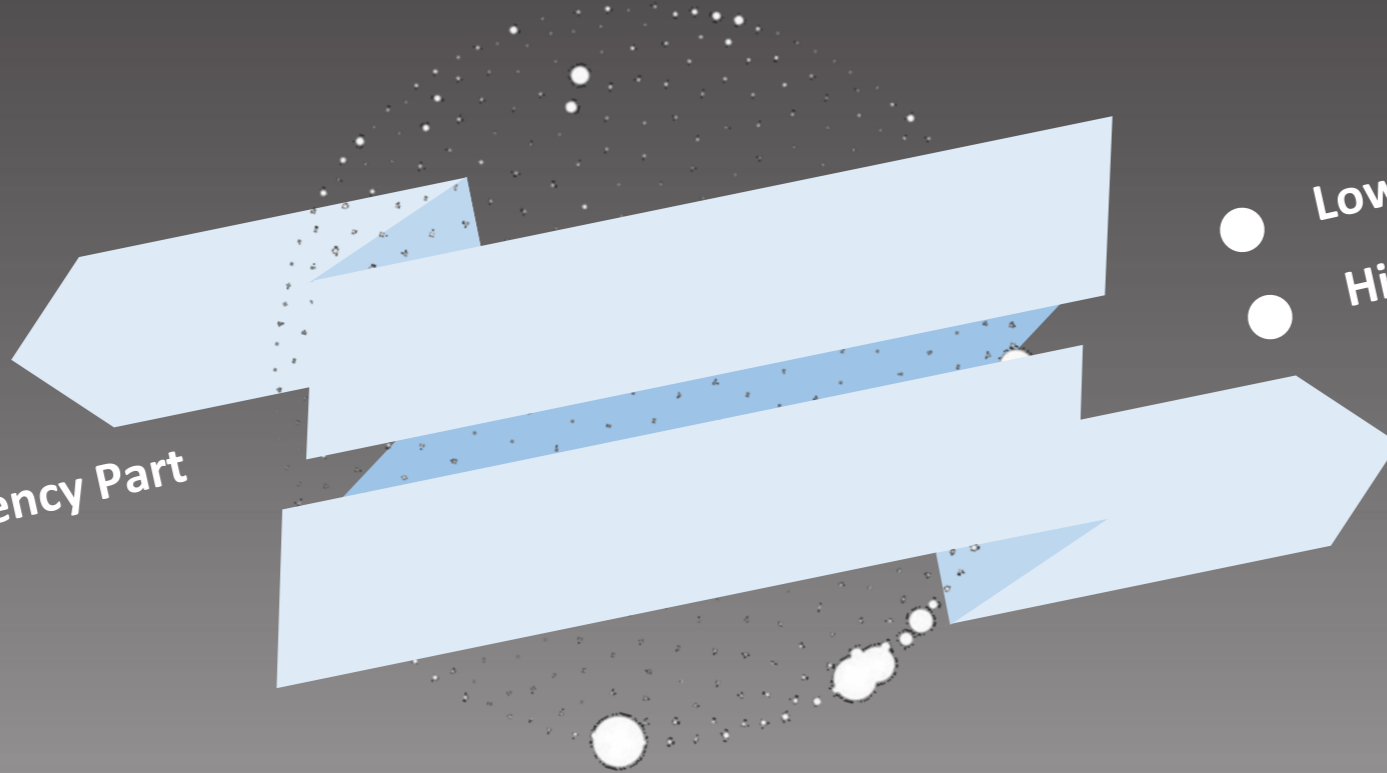
Anti-interference



Part 2.1 Automatic Tuning

- High Frequency Part
- Fast Speed

- Low Frequency Part
- High Accuracy

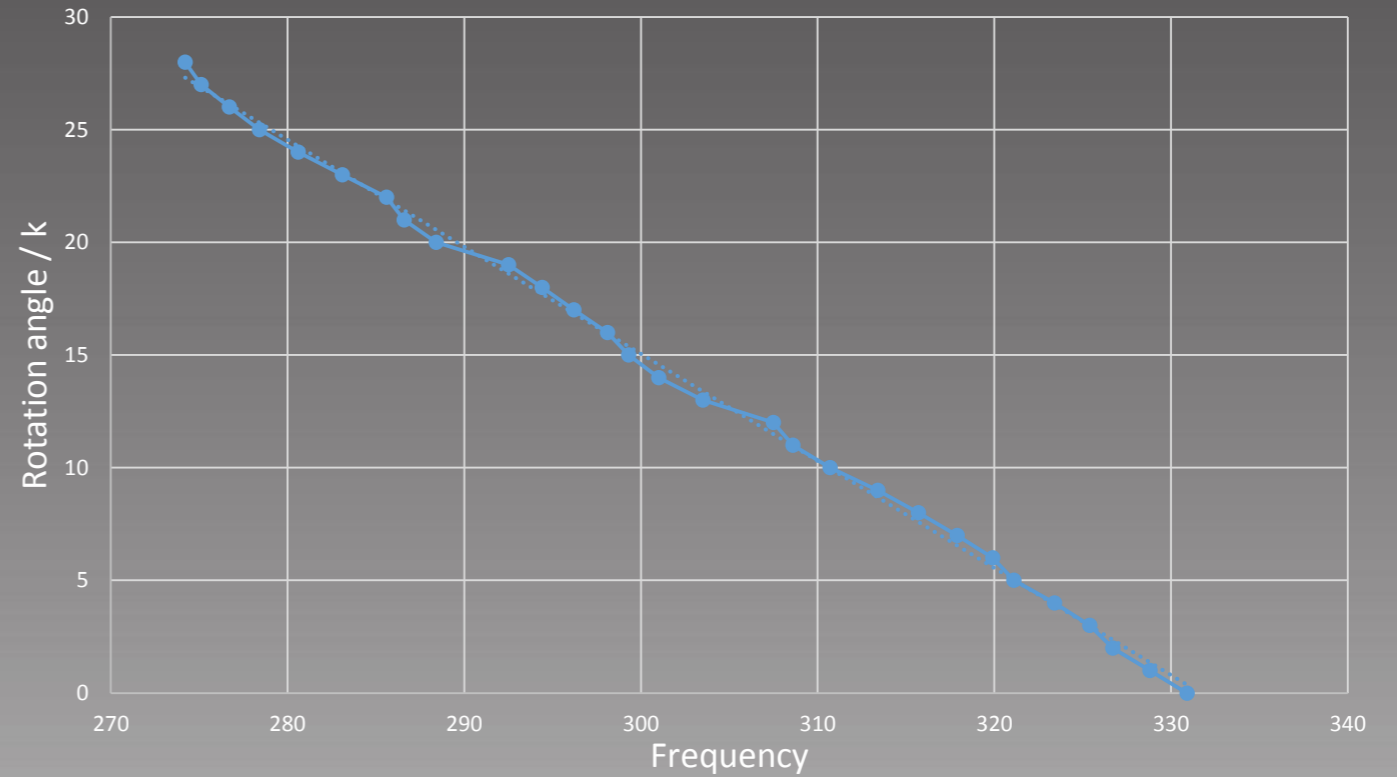


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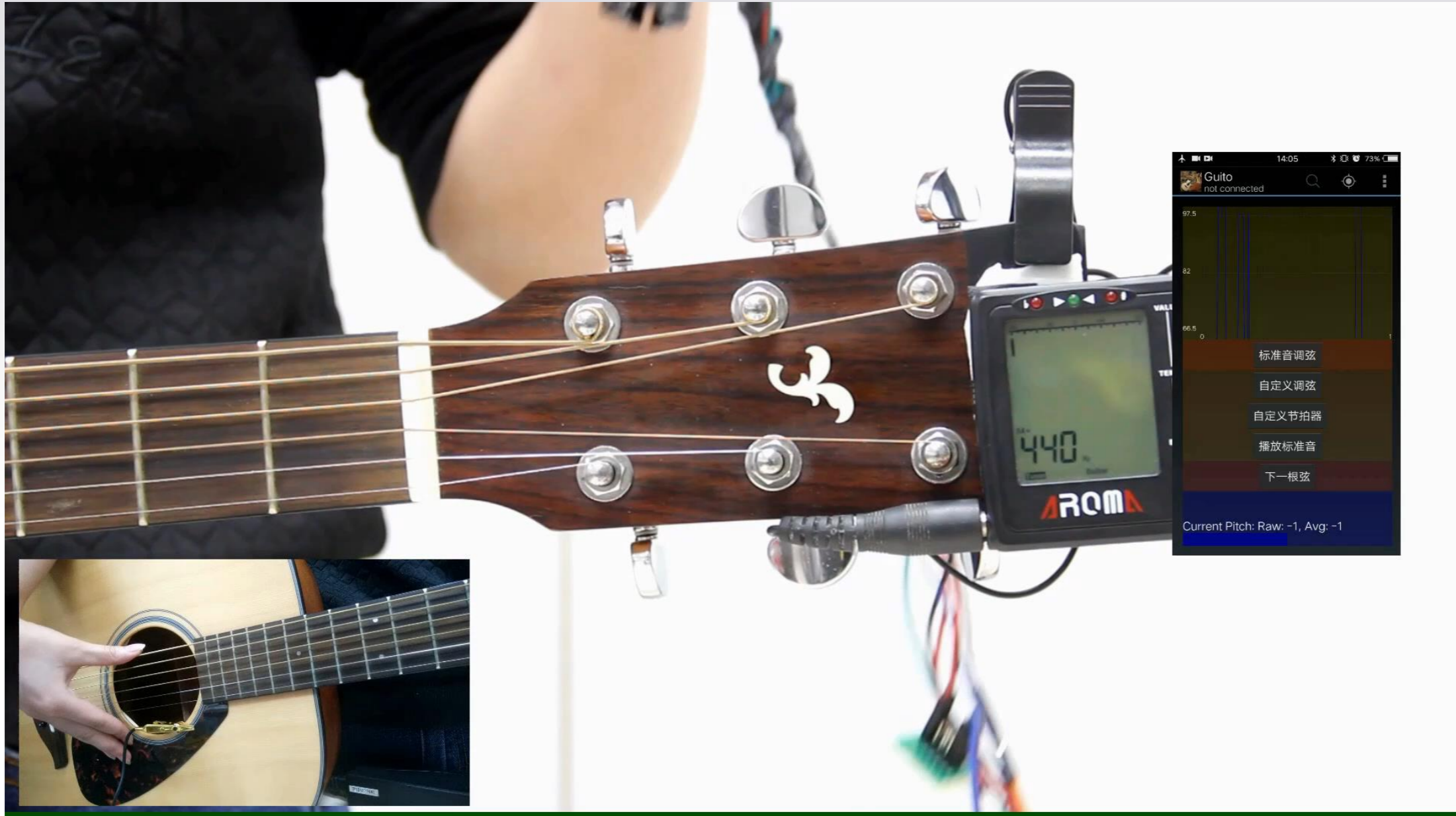
Adjustment Distance

- Coarse Tuning
- Least Square Method
- Fine Tuning
- Close-loop System

Frequency – Rotation Angle / k (1st String)



Part 2.1 Automatic Tuning



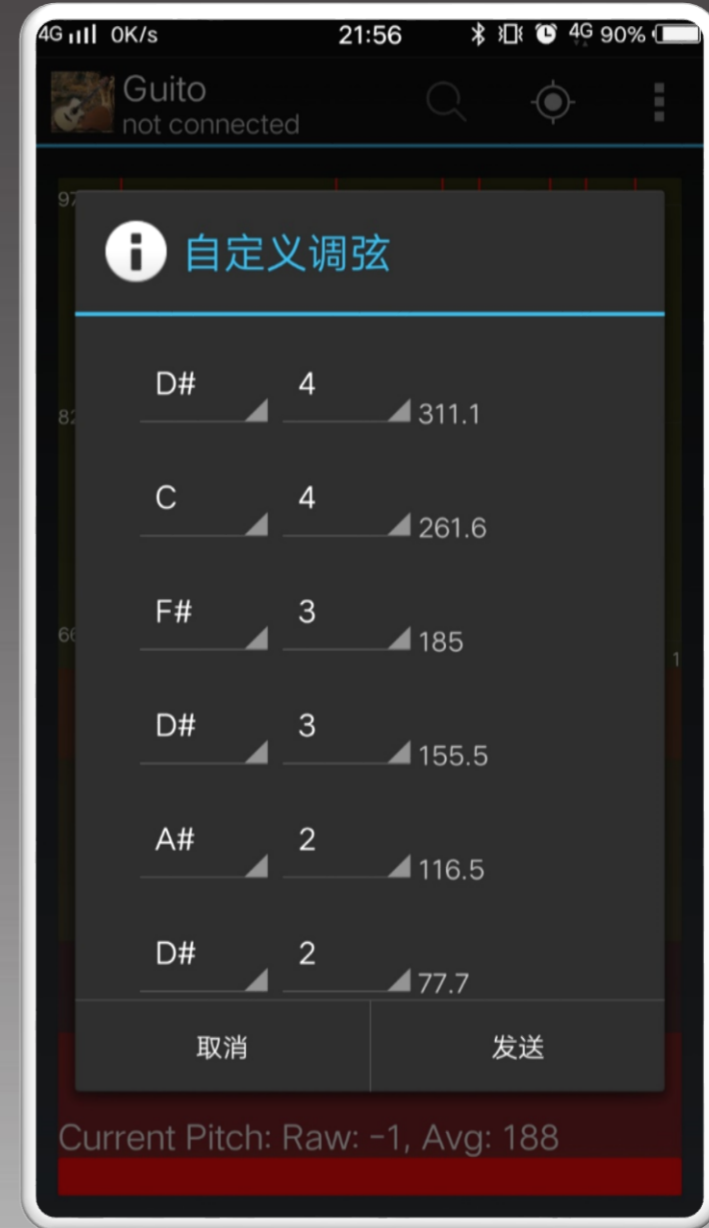
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Application

User Defined

For Professional Players

Part 2.2 Customize Tuning

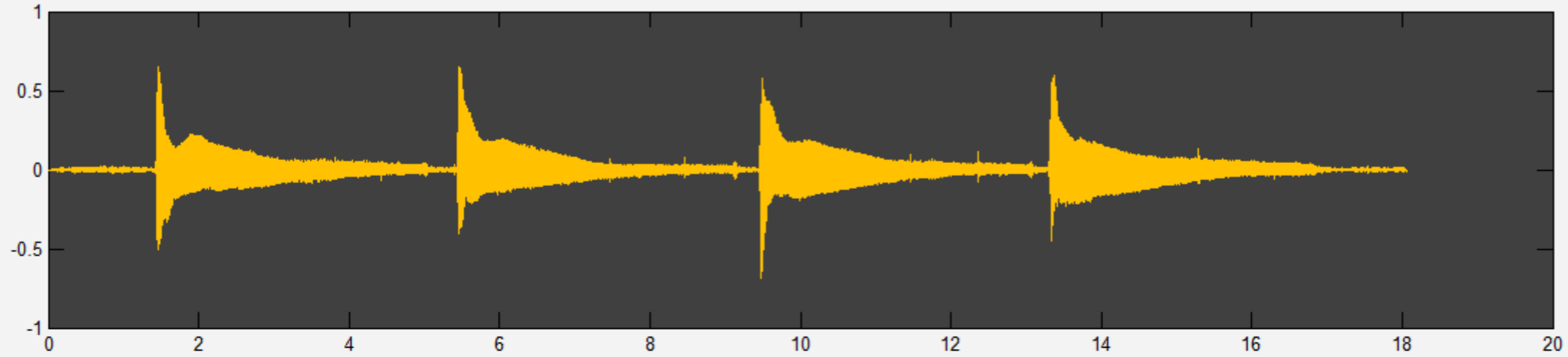


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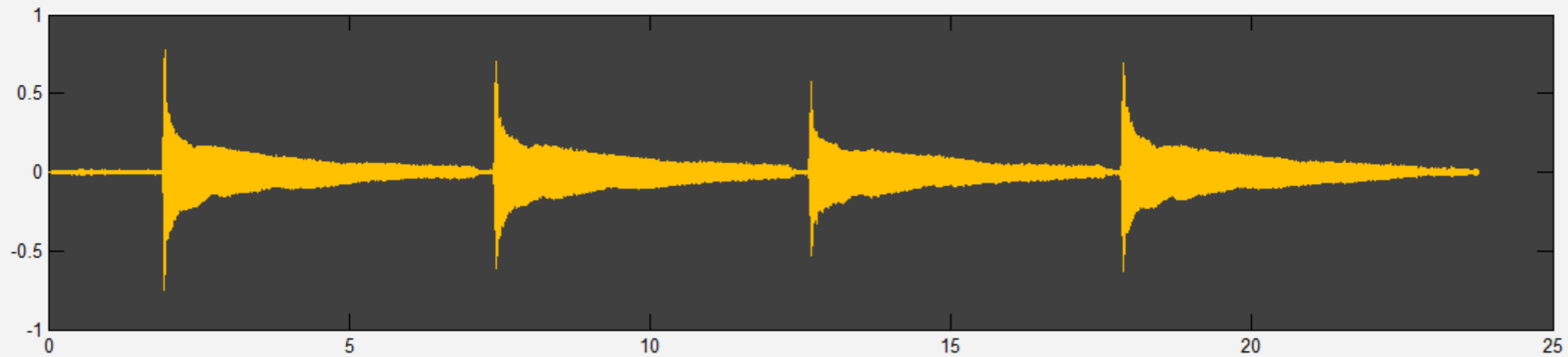


Musical notation for Part 2.2, including a staff with a treble clef, a key signature of two flats (B-flat and E-flat), and a time signature of 3/4. The notation is divided into three measures, labeled 83, 84, and 85. Below the staff is a guitar tablature (TAB) section with six lines, showing fret numbers and chord symbols.

83	84	85
(8)	2 6 6 5	(3) 3 3 1
	3 1 0 0 3	



Kapok LD18



YAMAHA F370

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Summary

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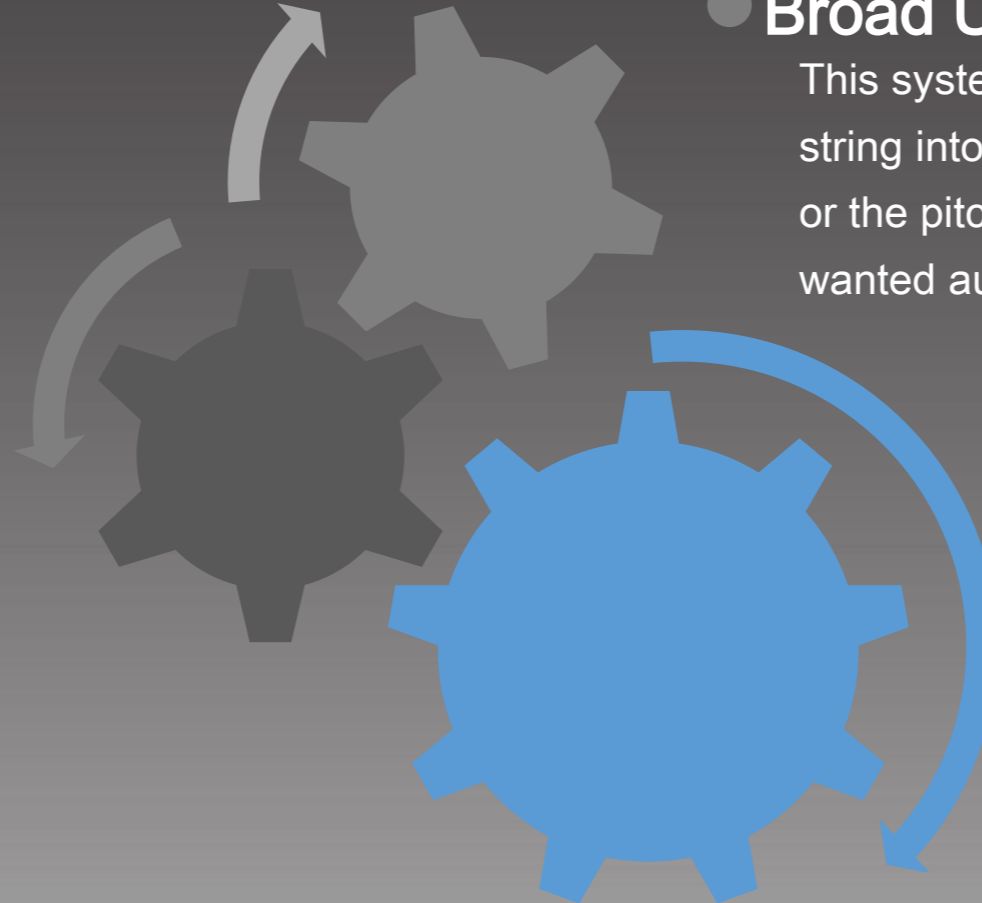
Performance Parameters

System Performance	Parameters
Recognizable Frequency Range	20Hz ~ 2.5KHz
Range of Tuning	35Hz ~ 1760Hz
Accuracy of Tuning	About 3 cents
Time	About 20s
Speed of Motor	10rpm ~ 180rpm
BPM of Metronome	30bpm ~ 250bpm

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- **Automatic**

This system can tune the string into the right pitch or the pitch that you wanted automatically



- **Broad Usability**

This system can tune the string into the right pitch or the pitch that you wanted automatically

- **Multi-Function**

You can also enjoy some good functions like metronome, tuning customize and so on

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THANK YOU FOR WATCHING

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