

COMPUTER MUSIC

Languages and Systems

Prof. Fabio Antonacci

Prof. Marco Olivieri

Homework 1 – Assignment 3

HARMONIZER EFFECT

Work Team

Audio Synthesis Enterprises

Lelio Casale

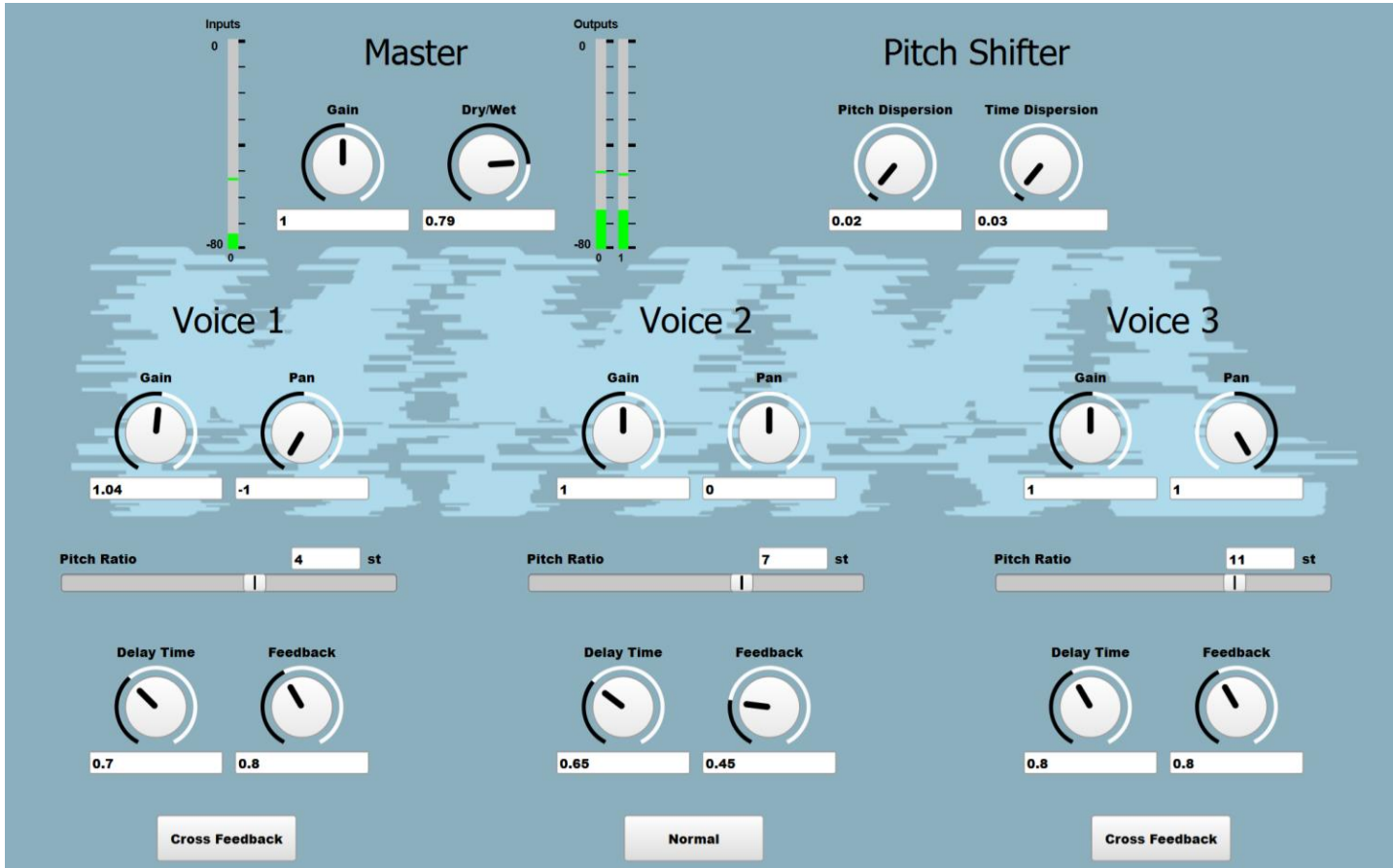
Marco Furio Colombo

Marco Muraro

Matteo Pettenò

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HarMMMLonizer

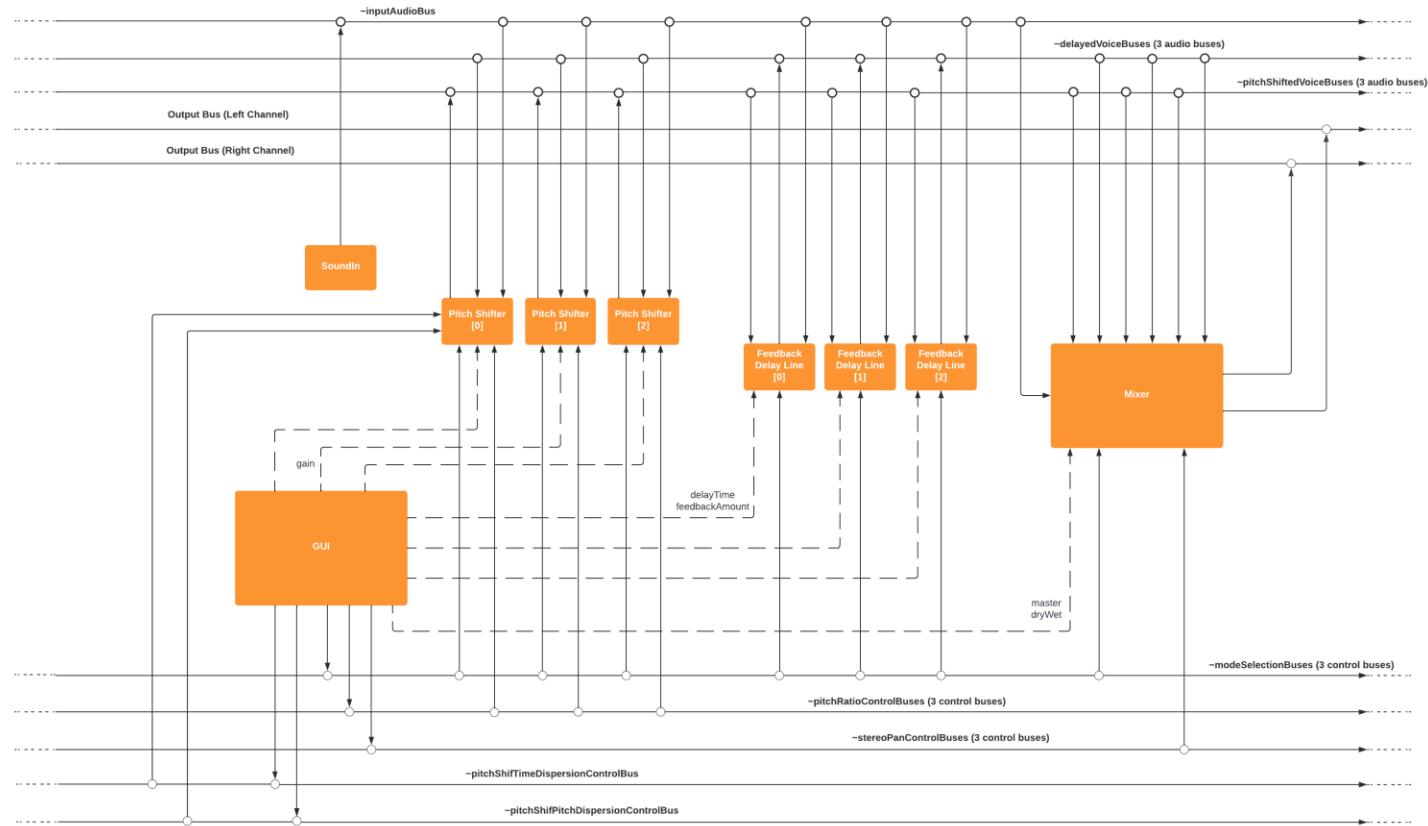


INTRODUCTION

Main Features

- 3 pitch shifted voices harmonizer
- Full control over single voice gain and pan
- 3 different delay modes: normal, pitch-shifted feedback and cross-feedback
- Master gain and dry/wet knob to control final result

SW ARCHITECTURE



Processing Blocks

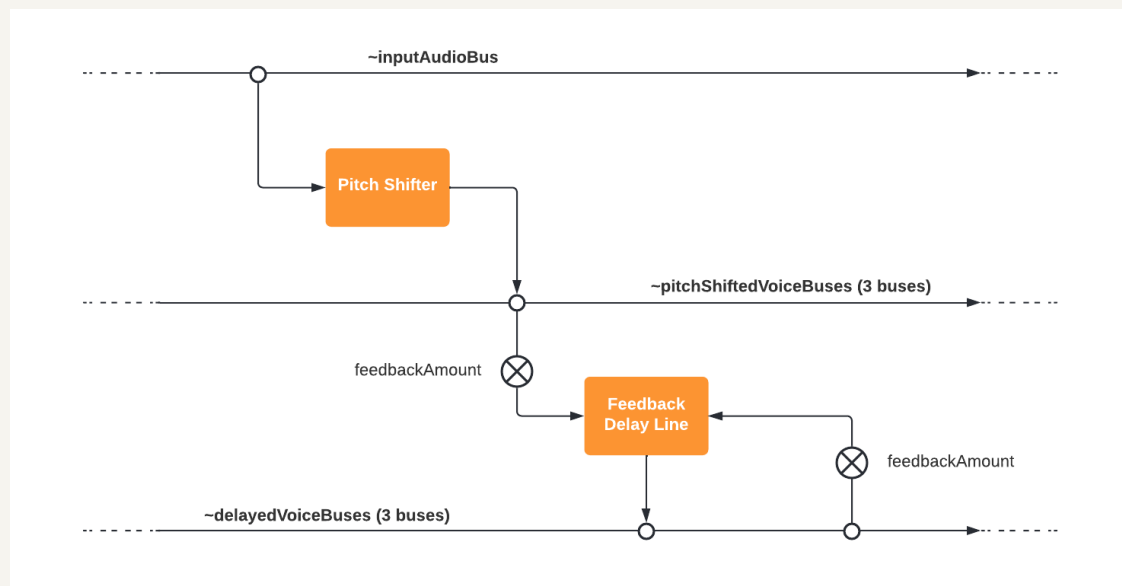
- Audio input
- Pitch Shifter (1x voice)
- Feedback Delay Line (1x voice)
- Mixer

Controls

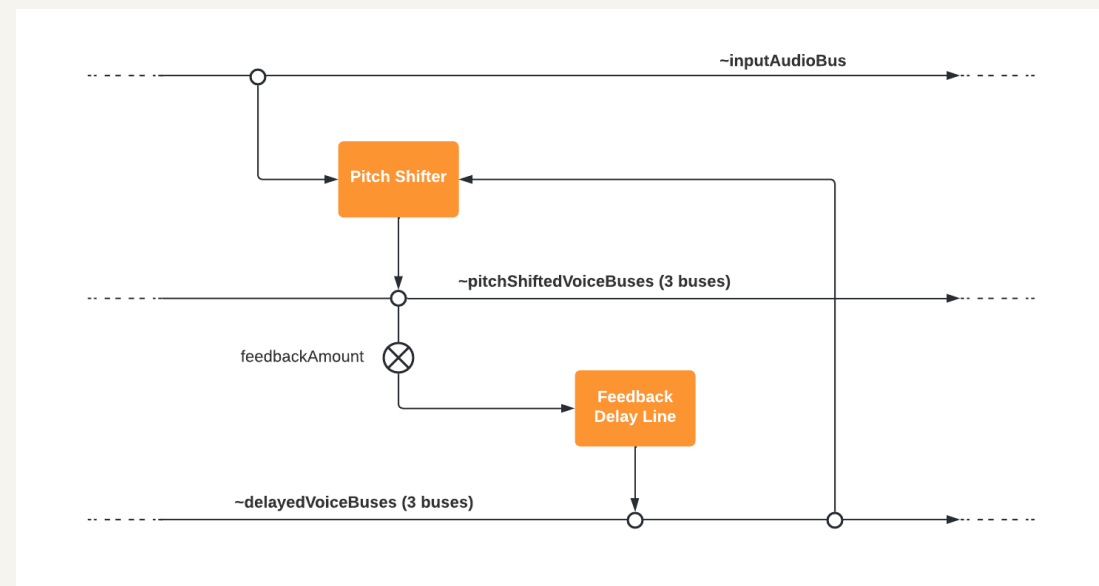
- Buses: store numbers into environmental variables so that all the blocks can exchange messages with each other

DELAYS

Standard Delay

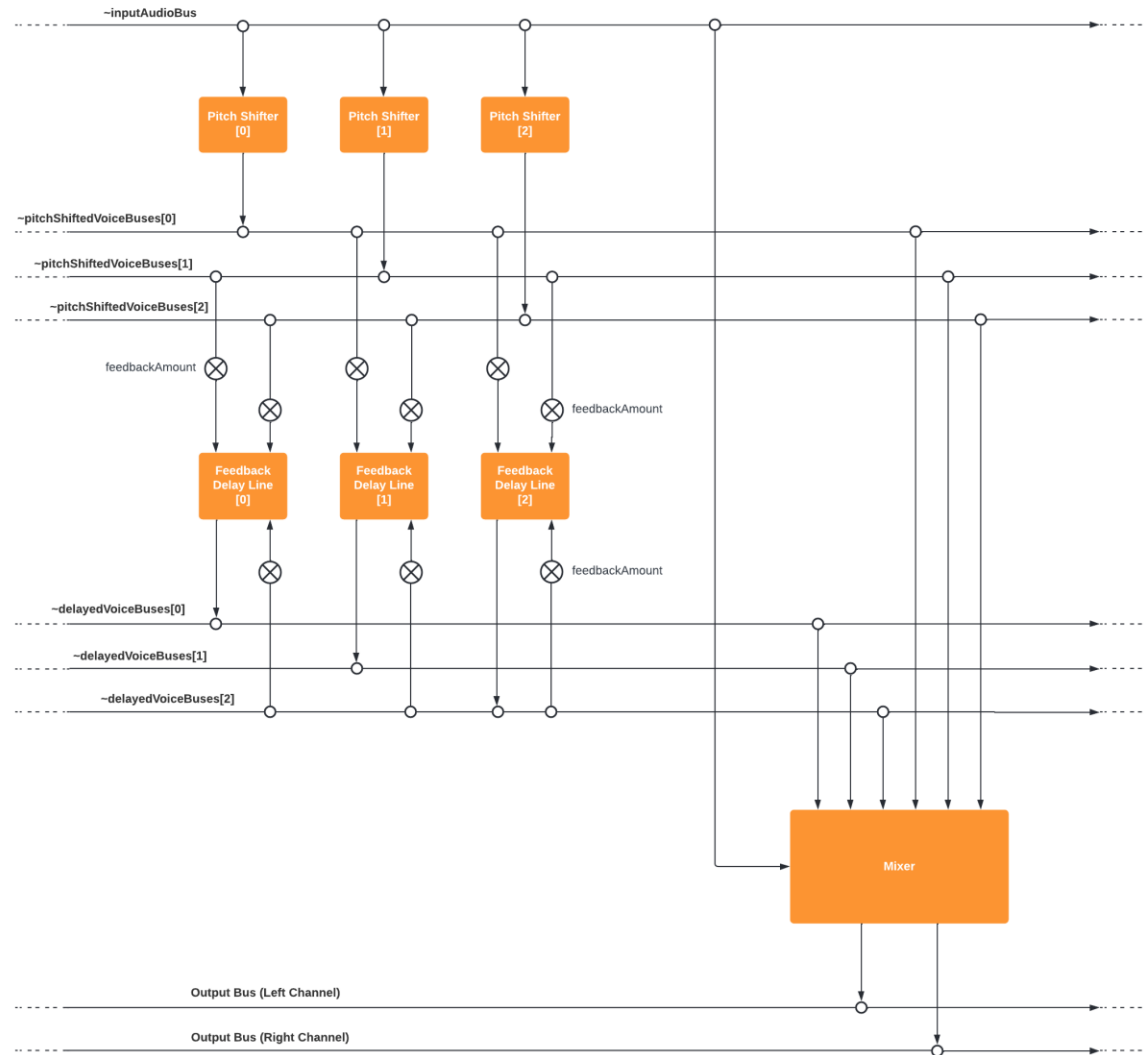


Pitch Shifted-Feedback Delay



- Delay achieved through a feedback mechanism and the amount is easily controlled.
- `FbNode()`: Quarks class that creates a feedback loop within a `SynthDef`.
- Standard Delay Mode: the signal is shifted first, then goes into the weighted feedback loop.
- Pitch Shifted-Feedback Delay: the signal is shifted again at each iteration.
- `FeedbackAmount` set to one creates a looper

CROSS-FEEDBACK



- The feedback fed into each voice is a mixture of all the other active voices.
- The mixer collects both the pitch-shifted voices and the delayed ones.
- Ping-Pong Effect with two active voices panned to the opposite sides.

PITCH SHIFTER

Granular Pitch Shifter

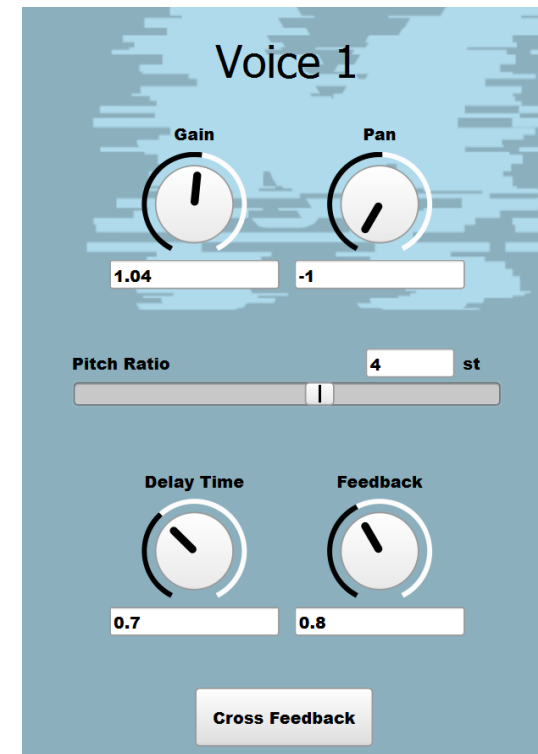
Basically, the granular pitch shifter slices the input signal into waves that can be individually looped and then played faster or slower to increase the pitch or lower it.

General controls

- Pitch Dispersion
- Time Dispersion

Controls over single voices

- Gain
- Pan
- Pitch Ratio (amount of semitones upward or downward)



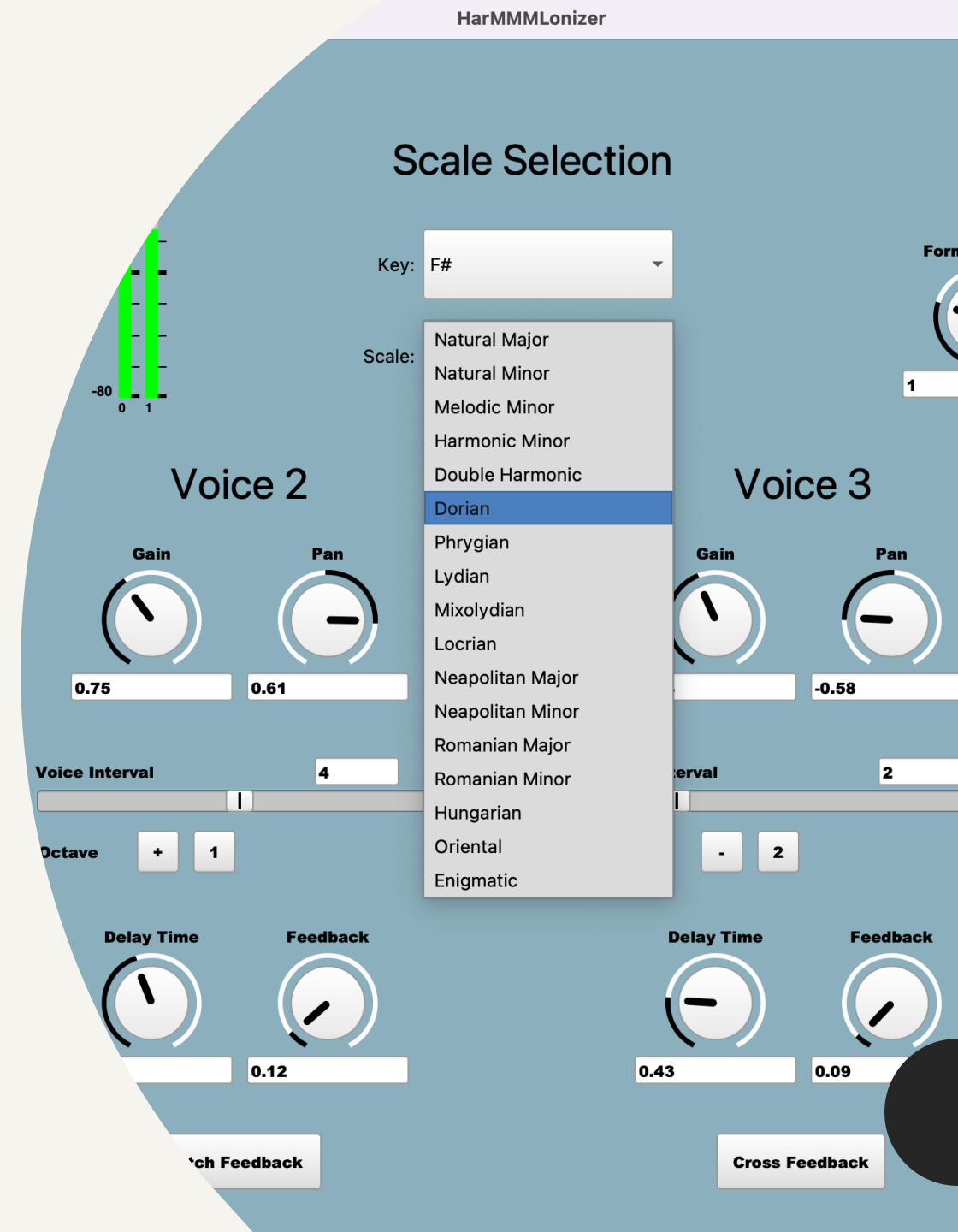
SMART PITCH SHIFTER

Upgrade for HOMEWORK 3

The input note is considered to be the root of the harmony that is going to be created.

Controls

- Key
- Scale: 17 musical modes available
- 1 / 2 octaves upward / downward pitch shifting



DEMO VIDEO

[HarMMMLonizer.mp4](#)

THANK YOU!

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