

CprE 492

Date: 03/09/18 – 03/23/18

Team: 39

Title: Sound Effect Devices for Musicians

Advisers: Dr.Chen & Dr.Geiger

Team:

Tom Kimler – Team Lead

Virginia Boy – Power Lead

Ben Reichert – Test Lead

Dan Kroese – Embedded Lead

Garrett Mayer – Software Lead

Weekly Summary:

We gathered more data for testing the tube emulator model for 20 waves. These consist of different frequencies and voltages to see how the model should change from frequency to frequency and magnitude. Additionally, we took two different approaches to solving the tube emulator using Matlab. The first method uses high poles to model the wave as a linear function. This design would have use create multiple models for the tube amplifier and use a piecewise analysis to determine which model should be used in the wave. This is essentially a piecewise of linear functions of the tube amplifier. The second model uses a sum of sine waves. This is a more realistic approach of the sound waves, but we have not had significant results from doing the modelling. We are giving both methods a week longer to model the waves, and we will then pursue the best after the results are given. The second approach is more ideal because it is periodic model, and nonlinear which is what tube amplifiers are seen as.

Past Two Weeks Accomplishments:

Tube Emulator Design – Dan, Virginia, Garrett, Tom

- Wrote Matlab code that broke source signal voltage in vs voltage out into two curve with a linear model correspondence to map input to output voltage.
- Also graphically shows the fit level and graph of what portions of curve are each fit. This solution used linear transfer poles of degree 20 to get a fairly close solution.
- Wrote Matlab code that emulated the emulator in the time domain using sum of sine waves. We believe this is promising because it is a realistic model of sound waves.

Data Acquisition – Tom, Ben

- Retrieved data from test bench on 20 move signals to test the models in the future and currently

Pending Issues:

Tube Emulator Design – Everyone

- Decide on an approach and have everyone pursue solving the problem together.

Individual Contributions:

Team Member	Contribution	Weekly Hours	Total Hours
Ben Reichert	Data Acquisition	10	46
Tom Kimler	Data Acquisition & Tube Emulator Design	14	55
Garrett Mayer	Tube Emulator Design	9	48
Dan Kroese	Tube Emulator Design	8	32
Virginia Boy	Tube Emulator Design	8	33

Comments:

N/A

Plan for Next Two Weeks:

Tube Emulator – Everyone

- Description

Summary with Advisors:

We talked about the preliminary emulator approaches. Both seem plausible, but we decided to give one more week before we all commit to a particular approach. Once we decide on which emulator version we will be using, everyone will be focused on designing the emulator that way.

