

## Project 2 Reflection

### **Project Outcomes**

#### **Model**

One of the greatest strengths of our model was its flexibility to different input waveforms and various values for the inductor, capacitor, and load. One weakness is that it idealizes every component in the model, including the diodes; the model does not account for the voltage drop across the diodes, nor does it consider non-ideal behavior of its other components. The result of this is that the model does well in qualitatively describing the real world while doing much worse with quantitative description.

The abstract and analytical models of the circuit shared strengths and weaknesses, yet they were distinct from each other in a few ways. The abstract model broke the circuit into states and used a piecewise function to describe those states. For contrast, the analytical model approached the circuit from a perspective of Kirchhoff's voltage and current laws, producing a second-order differential equation. The biggest difference between the two models' results was that the analytical model was more continuous than the abstract one.

If I were to spend more time on the project, I would like to produce a more realistic analytical model of the circuit by considering non-ideal components. This would connect the model to reality and make it more useful overall. I would also like to consider a different question than the type of input waveform because the input waveform is rarely something that can be controlled in applications of this circuit. Instead, I would like to model different combinations of components based off of constraints such as budget and size.

#### **Personal Goals**

My first personal goal for this project were to exceed the expectations more than I did in project 1, and I can happily say that I met this goal. My second personal goal

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was to model something applicable to the real world, something that matters. I met this goal by choosing a question and making a model that has clear connections to reality, but I could do better by improving the model's closeness to reality as I described before. As for project 3, my goal is to do a project that provides useful and surprising insights to something we believe is already "figured out."

## **Teamwork**

### Teaming

My partner and I worked well as a team by communicating often and collaborating through GitHub. It was always clear whom was assigned to what tasks, and we never had any issues with things getting done on time. We could have done better with dividing the writing between us equally, but where I did not write much for the essay I instead did much of the interpretation and modeling. In our teaming agreement, we agreed to parallel work, merge hangouts, and good documentation. These were successfully executed, as shown by how well documented our final project is. I feel that it could be understood by someone outside the project pretty well if needed.

Finding ways to contribute and to get contributions was easy for this project. We managed both of these through clear expectations of assignments and when they should be done. These often depended on each other, but we never had any issues getting them done. I would have improved how we accomplished this by documenting the assignments in case of miscommunication or forgetfulness. Overall, I would like to carry the experience of having both members fluent in programming into project 3 because it removed the hassle that held many other teams back, causing frustration.