1. Formulate the research and development question(s)

What will the technical specs be?

How to control MIDI software?

How to build a MIDI controller?

What hardware will we use?

Which programming language should we use?

Is there a function library for MIDI?

1. Establish context for your work by showing what has been done within the market

Digital guitar amplifiers - also known as amp sims - are software that use algorithms to reproduce the response of a real guitar amplifier. These are typically used in a DAW (Digital Audio Workstation) as a plugin, which can be attributed to a browser and extensions. However, they are increasing becoming available as a standalone applications as well. These are great for studio use but not practical for a live performance. Some of the most popular amp sims today come from companies like Native Instruments, Neural DSP, and Joey Sturgis Tones.

<https://www.native-instruments.com/en/products/komplete/guitar/guitar-rig-7-pro/>

<https://neuraldsp.com/plugins>

<https://joeysturgistones.com/collections/toneforge>

For live performances, products like Axe-Fx and Kemper Profiler are used:

<https://www.fractalaudio.com/iii/>

<https://www.kemper-amps.com/products/en_ca/profiler-stage.html>

These products are commonly referred to as digital amp modelers, or just amp modelers. They are all in one devices consisting of a computer, audio interface, and MIDI controller that come preloaded with a variety of amp sims and fx processors.

* can you modify your project so as to reach a "niche" market?

The product is already targeted towards what could be considered a "niche" market.

* is there a limitation or constraint that you can address to increase the attractiveness of your product?

Allowing the MIDI controller to seamlessly switch between multiple amp sims on the host computer would be the biggest leap forward in terms of the product's limitations. A constraint to this products sucess would be the number of amp sims available as a standalone application. While running an amp sim as a plugin in a DAW does not change its functionality, running multipule plugins in a DAW will eat up a considerable amount of resources compared to running those same plugins as standalone applications. These factors will determine the overall attractiveness of the product.

1. Expose the gap within current products in meeting the "need" or solving the "problem"

The problem with the current virtual guitar rig market is that there is an ecosystem gap between amp sims used in the studio vs amp sims used in a live setting. The software in amp modelers on the market are generally considered inferior to the software used on a typical computer. As a result, the live rig and the studio rig are typically two seperate ecosystems; amp modelers are used in a live setting due to their practical form factor and interface, while plugins in a DAW are used in the studio due to their superior quality and flexibility. Some plugin developers have taken note of the success of amp modelers and begun releasing their own units. While this brings studio quality amp sims to the live performance market, these products are proprietary, and will force the consumer to stay in that manufactures ecosystem.

* how does your proposed product solve the issue that much better (is it cheaper? faster? more accurate?)

our product solves the issue because it will be open source instead of proprietary. This means it can interface with any amp sim that can run on a computer and supports MIDI control. This gives the consumer control of all of their favourite amp sims from one device. Unlike the amp modelers on the market that are all in one devices, our product consists soley of the MIDI controller. As a result, it will be much cheaper since the user will be using their own interface, computer, and software.

1. Refine your "answer" to the "problem"

In order to bridge the gap between the studio rig and the live rig, we will create an open source MIDI controller that can interface with any MIDI compatible amp sim running on a computer. The MIDI controller will allow the user to control all their amp sims from a single device. This will promote innovation and excel growth of the virtual guitar rig market, and as a result, have a positive impact on the digital audio industry as a whole.