Conventional guitar amplification and effects usually involves an amplifier and speaker setup with a separate effects pedalboard. For some musicians, hauling such a rig around may be impractical or out of their budget. AMPED aims to solve these issues by condensing such a setup into a two-piece package that fits in your pocket. It employs digital signal processing and the natural resonance of the guitar body to amplify and add effects to any acoustic guitar with a pickup. Just clamp AMPED to your guitar and let it take care of the rest!

**Exploded View**

- Lid cover of board housing
- STM32 board
- Board housing with clamps on the back

**Functional Flow Diagram**

- Audio signal from the guitar is outputted into the board
- STM board applies sound effects tremolo, reverb, delay to the signal
- LCD screen of the board has a guided user interface for users to adjust the sound effects and volume
- Signal with applied affects are amplified with the audio exciter placed on the guitar back

**Key Components**

- **STM Board with Casing**
  - Dual-core digital processing unit
  - LCD touch screen for GUI
  - Separate line in and out audio jacks

- **Audio Exciter**
  - Tripod feet structure serves as the mounting system on the guitar
  - Vibrates to a rigid surface to create sound

- **Portable Battery**
  - Supplies power to the STM board
  - Attached on the outside of the board housing

**Final Design**

Keep it clamped and play with AMPED

**Background**

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**Tremolo**

- Uses a low frequency sine wave to modify the amplitude of the input audio signal
- Adjustable parameters of this effect are rate and depth

**Reverb**

- Emulates sound of being in a room or space
- Consists of multiple delayed and attenuated repetitions of the original audio signal

**Delay**

- Creates a series of delayed replicas of the original audio signal, like an echo
- Each delay is slightly quieter than the original sound

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