Progress Report 4

Developing a Low-Cost, Machine Learning-Based Early Earthquake Detection System

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Objective: Finalize prototype design and figure out the means to obtain a shake table for testing.

Science Fair Qualification

We recently put together a presentation for the Governor's School science fair and got 2nd place in the engineering section. This meant that we would be eligible to continue to the virtual regional science fair, which was just due February 9th. We used computational data from our machine learning system to qualify. If we could get top 6 in our category for that, we will make it to the March 7th in person regional science fair, narrowing our time constraint to obtaining an earthquake shake table and creating a fully working prototype.

Remaining Materials

All of our materials for the prototype have arrived, hence allowing us to begin construction. However, there is one major part of this project that has not yet been obtained. That is the earthquake shake simulation table. Over the past weeks and even currently, we have been diligently working to find shake tables that go up to at least 50 hz frequency and can be controlled. First, we reached out to professors at George Mason's main Fairfax Campus to borrow their shake table. They responded by telling us that they will work on getting it working as it has not been used for months and said they will keep in touch. Recently, they emailed us back saying that the table is missing several key parts and would not function. Next, they responded, saying that we could create our own drill-powered shake table. In an effort to conserve time, we have been actively searching for better solutions in the area, whether that be to borrow or buy. Overall, we should have a shake table in the coming weeks, whether that be DIY or manufactured.

Safety Concerns

Last week, our group obtained a soldering kit to take the next step in building our prototype. However, we had not gotten a solder sucker. A solder sucker takes out the remaining residue after soldering. This is very important because this residue could cause corrosion and even electrical leaks which form a major hazard. We also do not have a temperature regulator to make sure the heat does not get out of control. Getting our hands on both of these items is the next step for completing this project in a safe manner.