Electric Skateboard Regenerative Braking
Intellectual Property Document

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Summary:
The electric skateboard has exponentially increased in popularity, quality, and capability in recent years, proving itself valuable to everyone from college commuters to professional racers. While there are many great electric skateboard brands out there, we believe there is still significant room for improvement. First, most electric boards with regenerative braking don't allow the rider to brake when the battery is full (bad for starting a commute down a hill) or when too much current is generated (bad for really steep hills). Our team seeks to resolve this issue by designing an electronics system that will redirect the excess current under braking away from the main battery.

The next issue concerns the trucks (which control steering sensitivity) Normally, a rider has to manually adjust the skateboard trucks. If the trucks are loose, the board will be highly maneuverable at low speeds, but will be incredibly unstable at high speeds. Conversely, if the trucks are tight, the board will be stable at high speeds, but hard to maneuver at low speeds. Our team seeks to resolve this by developing a system that will autonomously adjust the trucks while riding according to the speed of the board or input of the rider.

Our project is broken down into two separate but equally important parts. We will be building two prototype boards. One board will primarily focus on the entrepreneurial aspect of our project. Existing parts will be bought where available so that the focus of the board can be on the regenerative braking capabilities as well as the automatic adaptive truck system. We will be focusing on making this board as competitively viable as possible, while putting considerable effort into an easy to install, separate system which will control the truck adjustment.

For the second board, we will be using a larger board itself, and the primary focus will be to build as much from scratch as possible. We plan to learn as much as possible by building from the ground up. This should allow us to better understand the power system, the motors, and the speed controller. This means we will be building an open source ESC that suits our purposes as well as designing the controller. The first board will use a prebuilt ESC as well as a controller so that we will be able to focus more heavily on the improvements, while the second board will be focused on learning.

Why is This Project Important:
While electric boarding is thrilling and practical, it can be very dangerous. In 2012 alone, 5 people in the US and Canada died from electric skateboarding accidents. Furthermore, many riders have been seriously injured from the inability to brake down hills and from improper steering sensitivity in the trucks. This project, if implemented well, has the potential to vastly improve the safety of electric boards by addressing the above problems, which could literally save lives.

Types of IP:

Type of IP	Description
Patent	Patents are usually granted from a government agency, and help protect a design, process, or an improvement. This type of IP would be applicable to anything physically designed and built, such as a machine. They typically last for 20 years.
Trademark	Trademarks allow companies to control logos, symbols, and slogans so that they can differentiate themselves from other companies. A trademark would be used not for the invention itself, but for the brand or company that made the invention, to trademark their logo or slogan. They usually last 10 years.
Copyright	Copyright allows authors and creators to protect their work, whether it be music, a book, sound recordings, computer programs, or choreographic work. This means that it would protect work that is non-physical. Copyrights last the life of the creator plus an additional 70 years.
Trade Secret	Trade secrets allow companies to protect their process or practice that is non-physical, similar to a copyright, but specifically on how they directly do their business. Typically it would protect an "invention" or innovation in research and development, and would allow the company an advantage over similar companies which they do not wish to share their secrets with. They can be protected indefinitely.

Intellectual Property Related to Our Project:

The only intellectual property that would be related to our project in the foreseeable future would be the patent. Our project is largely physically designed and built, and also falls under the improvement category. A patent would protect these improvements and designs from being physically copied by competitors. As part of our entrepreneurship venture however, it would be possible that a trademark would be required in the future if we decided that we were to start a company based around our project.