Riding Revolution: Electric Skateboard Modifications

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With 50% of all trips taken in cars being under five miles, electric skateboards are becoming the go-to eco-friendly way to beat traffic and save on gasoline. I wanted to improve upon the many flaws and untapped potential in the current electric skateboard market. The first major problem was travel; currently due to several rules put in place by the FAA, you cannot travel on-board aircraft with batteries over 100 Wh, which equates to about 5-7 miles of use. To solve this, I split battery packs up into sections which maintained the needed voltage (36v), but were under the 100 Wh limit. Those batteries were then connected in parallel so you had the same range. The second issue was that the roads were too rough and full of potholes. This causes electric and non-electric boards to get stuck on small rocks, potholes, and debris in the road. To solve this, I designed a “wheel on wheel” design (PPA), which allows the user to quickly attach and remove the larger wheel within 2 minutes. Due to acceleration and braking issues resulting from the larger wheel having a higher moment of inertia, it requires more energy (torque) to induce acceleration. Furthermore, once the skateboard is moving, it is much harder for it to stop due to greater momentum, and leverage between the central axle and the outer circumference of the wheel. To fix and improve upon this problem, I am currently working on an in wheel gearing system, to not only scale back the greater torque created by the larger wheel to the effective original wheel size level, but to also allow for changing gear ratios resulting in increased uphill/downhill capability, acceleration and braking performance.

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