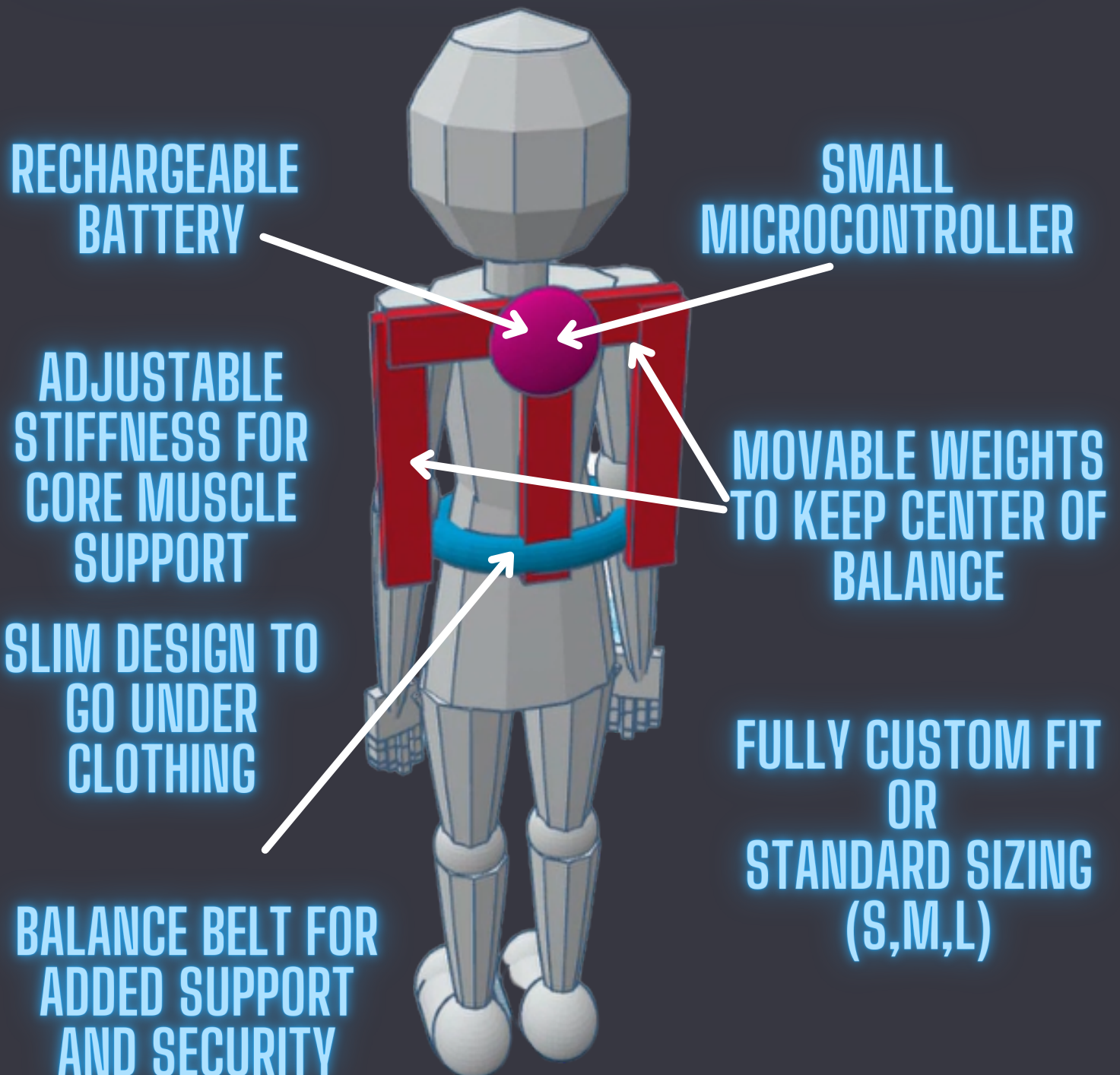


# THE WOBBLE SUIT





# THE WOBBLE SUIT

BALANCE YOUR LIFE

## FOR PEOPLE WHO NEED HELP BALANCING

Whether you are elderly, injured or recovering from a stroke, you may struggle with balance. The Wobble Suit can help you balance by helping maintain your center of gravity.

## FOR SPORTS

Learning new sports like roller skating, ice skating and downhill skiing is hard! External devices to help you balance may make it hard to move your legs the right way. The Wobble Suit can help you maintain your center of gravity so you can learn the new sport more easily.

## HOW IT WORKS

The Wobble Suit has two weights on the right and left to prevent falling. If you lean too far to the right or left, the weights will pull or push you to help keep your center of gravity and not fall. The design was inspired by a balance bird, which is a toy that uses two weights in the wing to maintain a center of balance over the beak. Tapping the bird in any direction will cause it to wobble, but not fall. The weights keep the center of balance. The Wobble Suit goes under your clothes and on your back and arms. It can be stiffened up to help keep you up straight if your core muscles are weak. It doesn't need arm strength to use.

## THE DESIGN PROCESS

We were inspired by the Balance Bird. It is a toy with two weights on the wings so if you hit it one way it balances back on its beak and just wobbles without falling off.

**Problem:** Arm and Core weakness can't support the weights.

**Solution:** Making the suit get stiff and offer support for weak core.

A small microprocessor, like Arduino, will control the weights movements. This will help keep costs low.

Our first prototype was cardboard, then we modeled our design in Tinkercad. Then we build a better prototype with small weights, motors and batteries.

## THE NEED FOR NEW TECH

- Millions of elderly people fall every year
- Once you fall once, the chance of a repeat fall increases
- In the elderly, four out of five falls cause an injury
- Fall death rates have increased 30% from 2007 to 2016.
- Nothing close to the Wobble Suit has been built.
- Walkers and canes help elderly people balance and walk, but it is not easy to use these. If you have weakness in your arms it is hard to use a cane or walker.
- In sports like roller skating, ice skating and downhill skiing, there are frames that help you to balance.
- These often can get in the way of proper leg movements for the sport, making it harder to learn what you are doing.



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## INSPIRED BY...

The Wobble Suit is based off of the Balance Bird toy. Weights in both wings help hold the bird's center of gravity over the beak. The bird may wobble, but it doesn't fall.



## PROS

### Pros:

- Slim design to be worn under your clothes so no one knows you have it on.
- Rechargeable battery
- Adjustable stiffness so that it helps you hold up the weights if you need it.
- You don't need strong arms for the Wobble Suit.
- Fully custom fit, or standard sizing
- Full freedom for natural leg motions when walking or learning new sports
- Balance Belt for additional support and security

## CONS

### Cons:

- Can run low on battery if you use it all day
- Works to maintain balance but can't catch you if you trip.
- Cost
- Water resistant (sweat, snow, rain) but not waterproof. You can't wear the Wobble suit in the shower so you will need to have something to keep you from being wobbly in the shower.

## OUR NEXT STEPS

**Engineering Advice:** help us to calculate what size and position of weight we need for different users.

**Human Testing:** Using a stunt person who is skilled in falling and wouldn't get hurt while testing the limits of the device. Once we were confident in the ability of the belt to help restore the center of gravity, we would move into testing with elderly individuals and see if it helped to reduce the fall rate.

**Publish Study:** Share our data and conclusions

**Market:** Therapists can custom fit each belt/suit and help them to fit on the elderly. Sell pre-made small, medium and large belts to use for public sports like ice skating, roller skating, and skiing.