SITAM

# FABRICATION OF TIMBER TRANSITION SEGWAY

A project submitted under the guidance of

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# LITERATURE REVIEW

- **Human transporter segway** which is regulated and powered by the consumer product safety commission rather the national highway traffic safety administration. The study examined the challenges for transportation by HT segway which includes types of pavements, travels on sloped surfaces, and issues on safety purposes. Brain .G.R. huges. investigated on the onboard computers to control the power directly on to the **wheels to balance the forces by the rider**, this study also shown that the segway balances at various conditions such as constant velocity, acceleration and deceleration. studied on the mechanical segway design and fabrication by using gyroscopic sensors, and electric motors driven by battery. **The designed model of segway costs around Rs. 22,000**/- which is very much **less compared** to the one which is in the **commercial market which made highly cost effective**. studied on the **robot mobility platform (**RMP ) segway which is a balancing robot base and it is also be able to play autonomously. The existing segway's in the market costs around **Rs. 26,000**/- which **is most expensive.**

# ABSTRACT


- The **Segway personal transporter** (PT) is a **four-wheeled**, battery-powered electric vehicle Computers and motors in the base of the device keep the Segway PT upright when powered on with balancing enabled. A user commands the Segway to go **forward by shifting** their weight forward on the platform and **backward by shifting** their weight backward. The Segway detects, as it balances, the change in its center of mass, and first establishes and then maintains a corresponding speed, **forward or backward**. To turn, the user presses the foot bar to the **left or the right**.
- The present project proposes a cost effective and innovative which costs around **Rs. 20,000**/- which is very less compared to the existing segway available in the market. The proposed project also aims to **reduce the e-waste by eliminating few electronic components**

# MATERIALS NEEDS

- DC Hub motors-2 at front wheels
- DC lithium-ion battery
- Controller Arduino board
- 6201 Bearings
- Iron shaft
- Package wood
- Bushings
- Rear wheels-2
- Sitting chair

# HUB MOTORS

## 24V DC Mega torque hub motors

– Hub motors are electric motors integrated into the hub of a wheel, commonly used in electric bicycles, electric scooters, and electric skateboards. These motors offer several advantages over traditional internal combustion engines or other electric motor configurations:.
- Suitable for small electric vehicle, electric bicycle, small electric scooter, etc.

- MY1016 24V 250W DC motor: rated power 250W, voltage 24V DC, rated current 13.0A, rated 400-500RPM, permanent magnet DC high- motor.
**Torque : .087NM**

HUB MOTORS

| S.No | SPECIFICATIONS | |
|---|---|---|
| 1. | Modal | MY1016 |
| 2. | Operating Power | 250W |
| 3. | Operating Voltage (V Dc) | 24V |
| 4. | Rated Current(A) | <13.0A |
| 5. | Rated Speed (Rpm) | 400-500RPM |
| 6. | Rated Torque(N-M) | 0.87NM |
| 7. | No Load Current(A) | 0.7-1.4A |

# DC BATTERY

DC lithium-ion battery is a type of rechargeable battery that utilizes lithium-ion technology to store and release electrical energy. "DC" stands for direct current, which is the type of electrical current typically used to charge and discharge batteries. Lithium-ion batteries have become increasingly popular due to their high energy density, relatively low self-discharge rate, and long cycle life compared to other rechargeable battery chemistries. They are commonly used in a wide range of electronic devices and applications

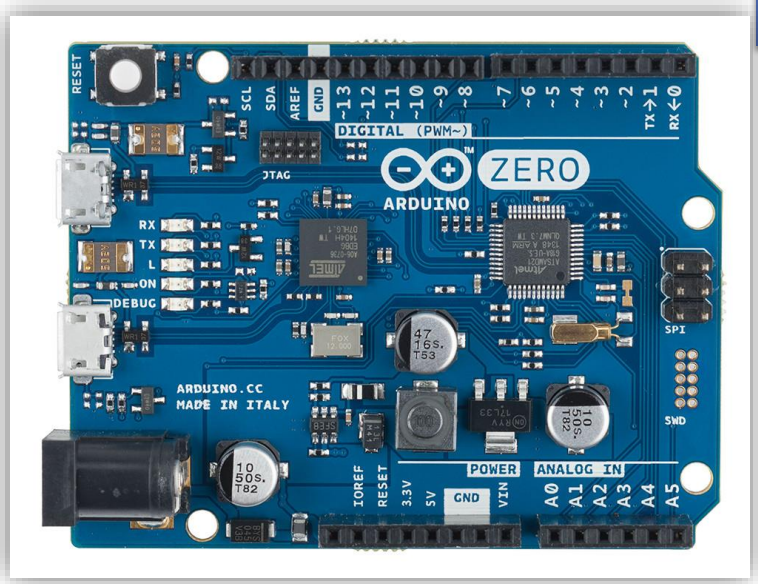
-24VOLT 12 to 15 Ampere Hour battery.
- Back up on 250 watts E cycle Motor.
- Battery has a capacity of 150 to 200 W.h

**DC lithium-ion battery**

# ARDUINO BOARD

Arduino board is an open-source electronics platform designed for creating interactive projects. It consists of both hardware and software components, making it easy for develop various electronic projects.

Arduino boards are widely used in various applications, including robotics, home automation, wearable technology, Internet of Things (IoT) projects, and educational purposes. cost-effective platform for exploring electronics and programming concepts.

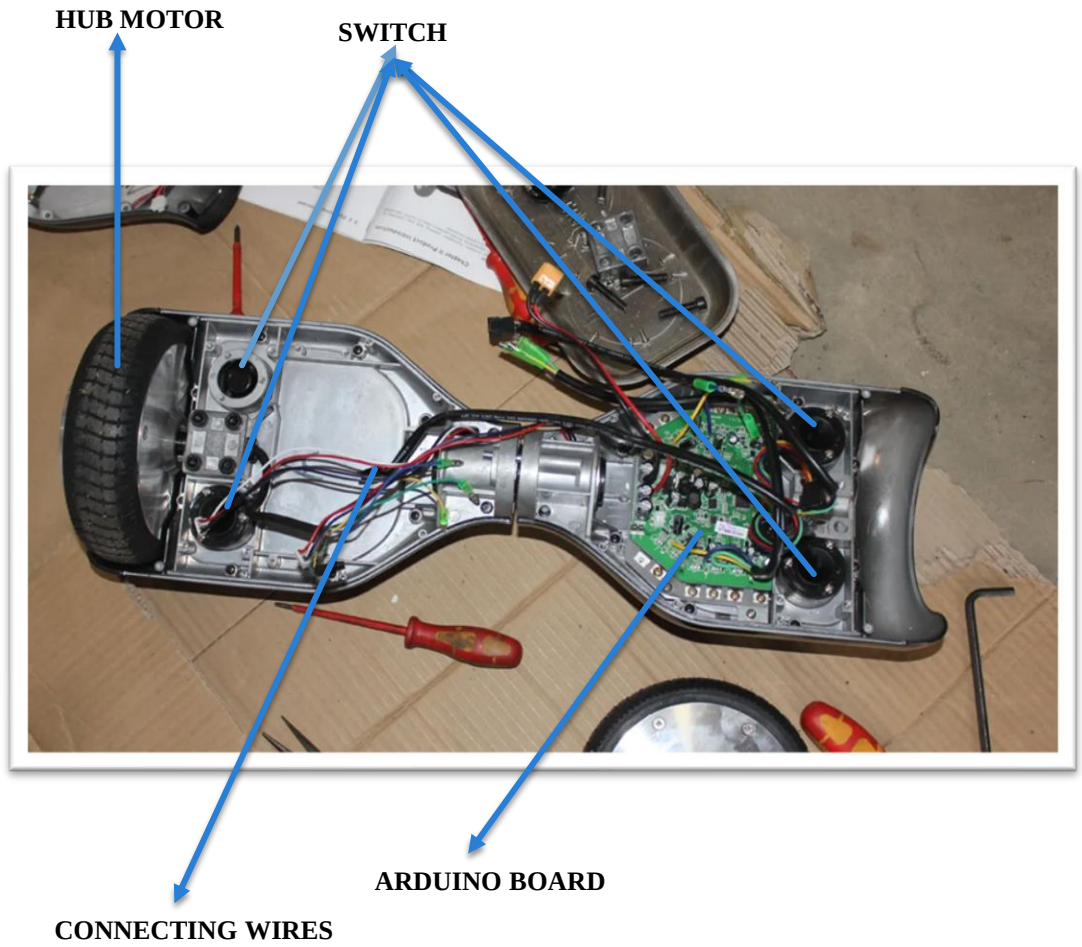



**ARDUINO BOARD**

- MOTOR CONTROL
- SPEED REGULATION
- DIRECTION CONTROL

# HOVERBOARD

It is also known as a self-balancing scooter or a smart balance wheel, is a two-wheeled, battery-powered, personal transportation device. Despite the name "hoverboard" which might evoke images of levitating skateboards , these devices do not actually hover above the ground. Instead, they are equipped with wheels that allow them to roll along the ground.



# REAR WHEELS

size 10 inch – 02
allow heavy objects to be moved easily facilitating movement or transportation while supporting a load.
- directly attached rear wheel of shaft

**REAR WHEELS**

# PACKAGEDWOOD

These products are essential in various industries, including construction, manufacturing, logistics, and retail They provide strength, durability for a wide range of applications. Additionally, they can be customized to meet specific requirements, such as size, shape, and load-bearing capacity. However, it's important to consider sustainability and environmental factors when using wood products, as well as regulations regarding the treatment and disposal of wooden packaging materials to minimize environmental impact.

**Packaged wood**

| S. No | OBJECT | DISTANCE (inches) |
|---|---|---|
| 1 | Depth | 27 |
| 2 | length | 30 |
| 3 | Hight | 8 |

# 6201 BEARING

It is a specific type of deep groove ball bearing. The designation "6201" indicates the bearing's size and dimensions according to the ISO 15 standard for metric bearings. Here's what each part of the designation typically signifies:

**6 -** Indicates that it's a single-row deep groove ball bearing.

**2** - Denotes the series, in this case, it's the 200 series.

**01** - Specifies the bore diameter, which is 12 mm in this case (since the last two digits multiplied by 5 gives the bore diameter in mm).


**6201 BEARING**

# IRON SHAFT

Segway as in the personal transporter device, typically, the term "iron rods" wouldn't be directly associated with it. Segways generally use a combination of lightweight materials such as aluminum and steel for their frame and structure, solid iron rods.
Long – 80cm, 12mm diameter.

**IRON SHAFT**

# BUSHINGS

Bushings are mechanical components used in various applications to provide a bearing surface and support rotating or sliding parts. They are typically cylindrical in shape and are made of materials such as metal, plastic, or rubber. Bushings are designed to reduce friction and wear between moving parts, improve the alignment of components, and dampen vibration

**BUSHINGS**

# ADVANTAGES

- Portability (compact and lightweight & easy to carry )
- Environmentally Friendly (rechargeable batteries helping to reduce carbon and air pollution compared to traditional vehicles)
- Convenience (convenient mode of transportation for short distances)
- Cost effective (low cost compare to market price)
- Easy to control
- Load capacity withstand around 70-80kgs

# CONCLUSION

- In this project a mechanical Segway is modeled and fabricated which is **cost effective** and **innovative model as compared to the existing segway available in the market**.
- The designed mechanical Segway can be used for a full extent for personal transportation use and safe to use for travelling at **low speeds.**
- The model which is designed is cost effective compared to the model which is available in the market.
- The study also **reduced the e-waste** by **eliminating few electronic components**.
- Much advancement can be made in future to this model to make it more effective by using sensors and servos to move and turn the vehicle smoothly.
- Also the load carrying capacity of the vehicle can be changed by using heavy motors and reduce vehicle weight by using **light weight durable materials for body.**


**For giving opportunity…**