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VIII Young Scientists Academy

Integrating Advanced Seat Tilting and Extending Mechanisms in the LOV Wheelchair for Enhanced Off-Road Mobility and User Autonomy

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This study delves into the innovative design of the LOV wheelchair, focusing on its advanced seat tilting and extending mechanisms. The seat tilting module, capable of accommodating inclines and declines up to 15 degrees, incorporates rearward tilting functionality to support users during steep descents, improving safety and stability. By integrating a linear motor-driven assembly that extends the seat forward, this mechanism ensures ease of transfer while maintaining optimal ergonomic positioning.

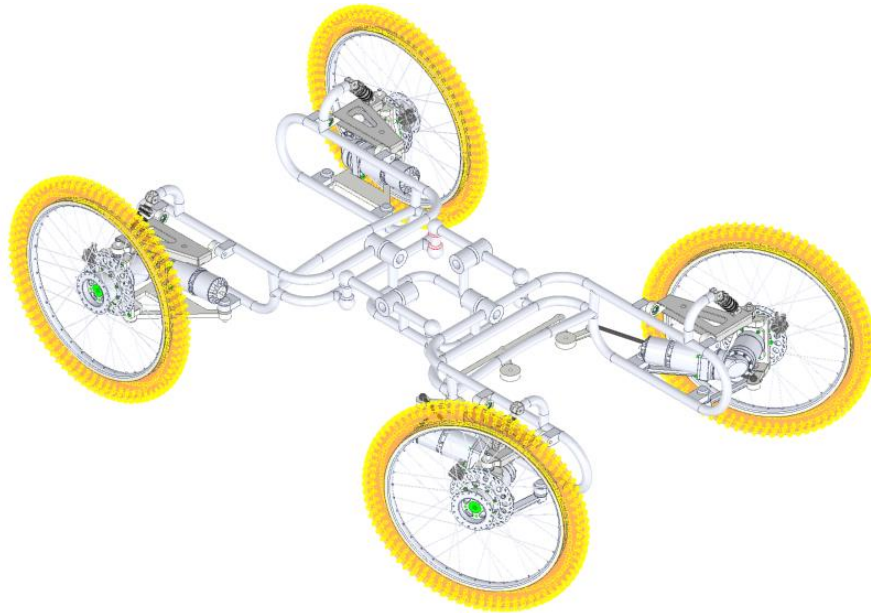


Figure 1. LOV Limit-of-Vehicle

Figure 2. Schematic representation of a suspension system on an innovative wheelchair

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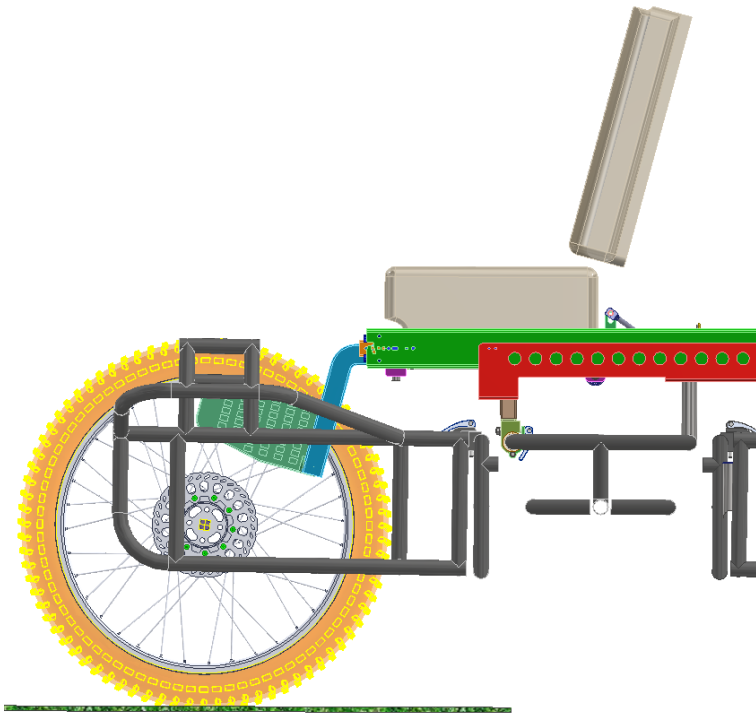
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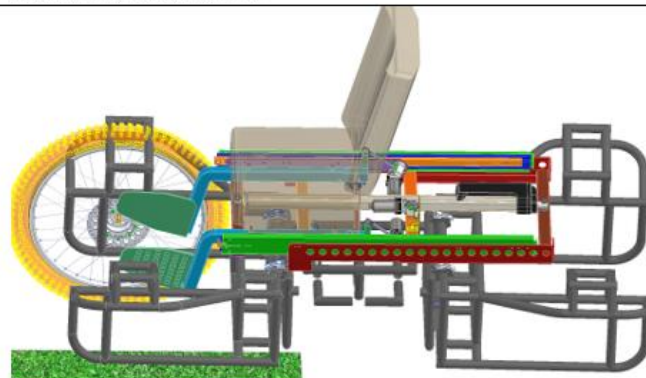


The location of the seat installation on the vehicle's suspension

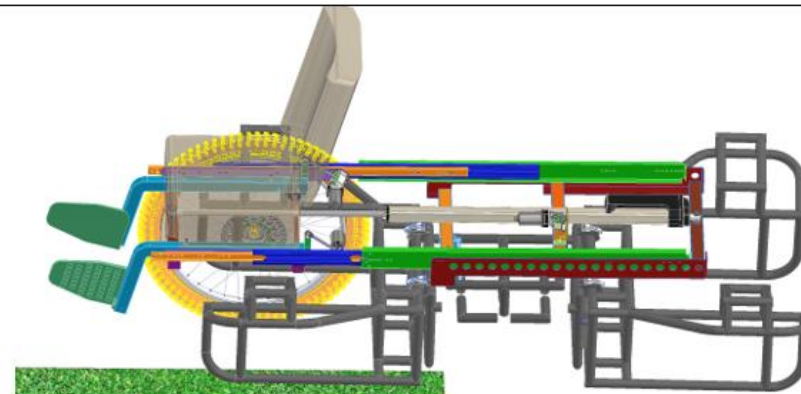
Identified criteria listed below:

1. Modular Construction,
2. Adaptation for Quadriplegic and Paraplegic Users,
3. Adaptive Seating,
4. Independent Suspension,
5. Steering System,
6. Hybrid Drive,
7. Limited Third-Party Assistance for Transport and Use,
8. Performance Specifications (Traction Force, Speed, and SSF),
9. Terrain Adaptability (Sandy Terrain and Inclines),

The seat is positioned to enable travel over uneven surfaces.



The seat in extended position



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