Docket #: S17-113

Grabity: A Virtual Reality Controller that Simulates Weight and Stiffness

Stanford researchers in the SHAPE lab have patented a virtual reality, haptic device called 'Grabity' that simulates weight, stiffness, and torque. Grabity uses two linear resonant actuators (LRA) attached adjacent to the fingers to simulate stiffness and buoyancy of virtual objects while grasping. Unlike existing devices, this efficient method provides realistic mass perception making it ideal for virtual and augmented reality and gaming applications.

Stage of Development - Prototype
Inventors have successfully built and demonstrated the prototype device. (See the following video demonstration.)

Video Demonstration of Grabity

Applications

- Haptics for **gaming, virtual reality and augmented reality**

Advantages

- First haptic device to provide the **perception of weight**
- **Efficient** method - uses only two LRAs with bearings and brake modules
- More **realistic and immersive** VR experience - simulates **grasping forces, weight, buoyancy, and stiffness**

Publications

- Choi, I., Culbertson, H., Miller, M. R., Olwal, A., & Follmer, S. (2017, October). Grabity: A wearable haptic interface for simulating weight and grasping in virtual reality. In *Proceedings of the 30th Annual ACM Symposium on User Interface Software and Technology* (pp. 119-130).
- Choi, I., Follmer, S., & Culbertson, H. (2021). *U.S. Patent No. 11,036,299*. Washington, DC: U.S. Patent and Trademark Office.

Patents

- Published Application: 20190114017
- Published Application: 20210041955
- Issued: 10,852,872 (USA)
- Issued: 11,036,299 (USA)

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