

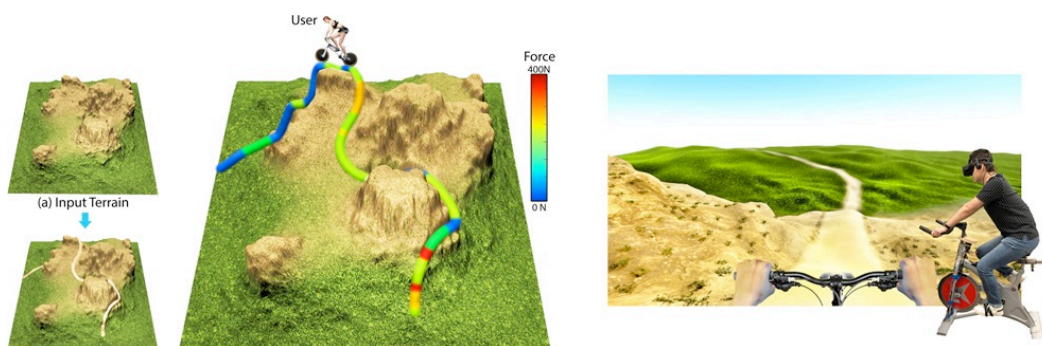
Gamifying exercise has proven both profitable and popular. This technology generates a realistic terrain based on a person's exertion goals when exergaming. This generated terrain is used by exercise equipment to simulate the feel of the path.

This technology redresses the extreme difficulty and time consumed by exergame designers when creating an exergaming workout that has difficulty levels that dynamically challenge people exercising with multiple exertion properties.

Artificial intelligence (AI) is used to generate exergame workout paths. The paths have multiple difficulty levels to achieve an exergamer's goals. Each path is created using different spatial considerations, and constraints such as landmarks and forbidden zones. The technology can also send instructions to a user's exercise equipment. The exercise equipment uses the instructions to activate haptic actuators, providing a realistic feel of the path. Designers can now generate games with exertion-aware paths in a fast, scalable, and personalized manner.

As an example, a Virtual Reality (VR) biking experience may be made more immersive by employing a bike that is programmed to adjust automatically to the physical property of a generated path using rules of physics. The generated path geometry is refined by applying road construction engineering concepts resulting in a natural feeling roadway. While there is existing work allowing people to bike in VR using panoramic images, such work does not consider the biking path's exertion effects. This technology extends existing technology by optimizing paths to help users achieve their exertion goals. The paths efficiently match the users' perceived levels of difficulty and exertion expectations.

- Saves game design time.
- Provides flexibility when generating paths.
- Eliminates the need to manually fine-tune paths to meet users' exertion goals.
- Exercising with generated paths in virtual reality makes exercise more engaging and fun.



Stage of Development

Research Prototype

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