

Anatomically Designed Next-Generation Computer Mouse for High Performance Digital Workspaces

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Abstract:

As modern computing environments move towards immersive spatial interfaces and complex 3D Modelling, traditional input devices have become a significant bottleneck in human-machine interaction. This work looks at the history of product development in the interface sector, especially at the evolution of computer mouse, how it evolved from mechanical trackballs to high-precision optical sensors. But with these technical advancements, the current computer mouse does not address two critical issues, Repetitive strain injury (RSI) from prolonged mouse use and disconnect with new virtual reality environments. To tackle these problems, this study looked at product evolution and industry trends to create conceptual designs for the next-generation of mouse that focus on both human ergonomics and utility across platforms.

This work looks at the development of a computer mouse from the form of mechanical trackballs to high precision optical sensors, by using morphological charts and the Pugh selection method to evaluate and refine design options systematically. The study filtered various technological combinations, including optical sensors, gesture recognition and wireless haptics. These processes established a clear direction for the conceptualization of next-generation mouse based on evaluation results. The design shows an integrated hybrid mouse idea that combines high-fidelity tracking.. This work has more than just a hardware upgrade effect, it also provides a scalable solution to lower repetitive strain injuries and make users more productive in high-performance digital workspaces.

Keywords:

Computer mouse, human-machine interaction, repetitive strain injury, morphological charts, product evolution, conceptualization.