

Eye Movement-Driven Authentication in Virtual Reality

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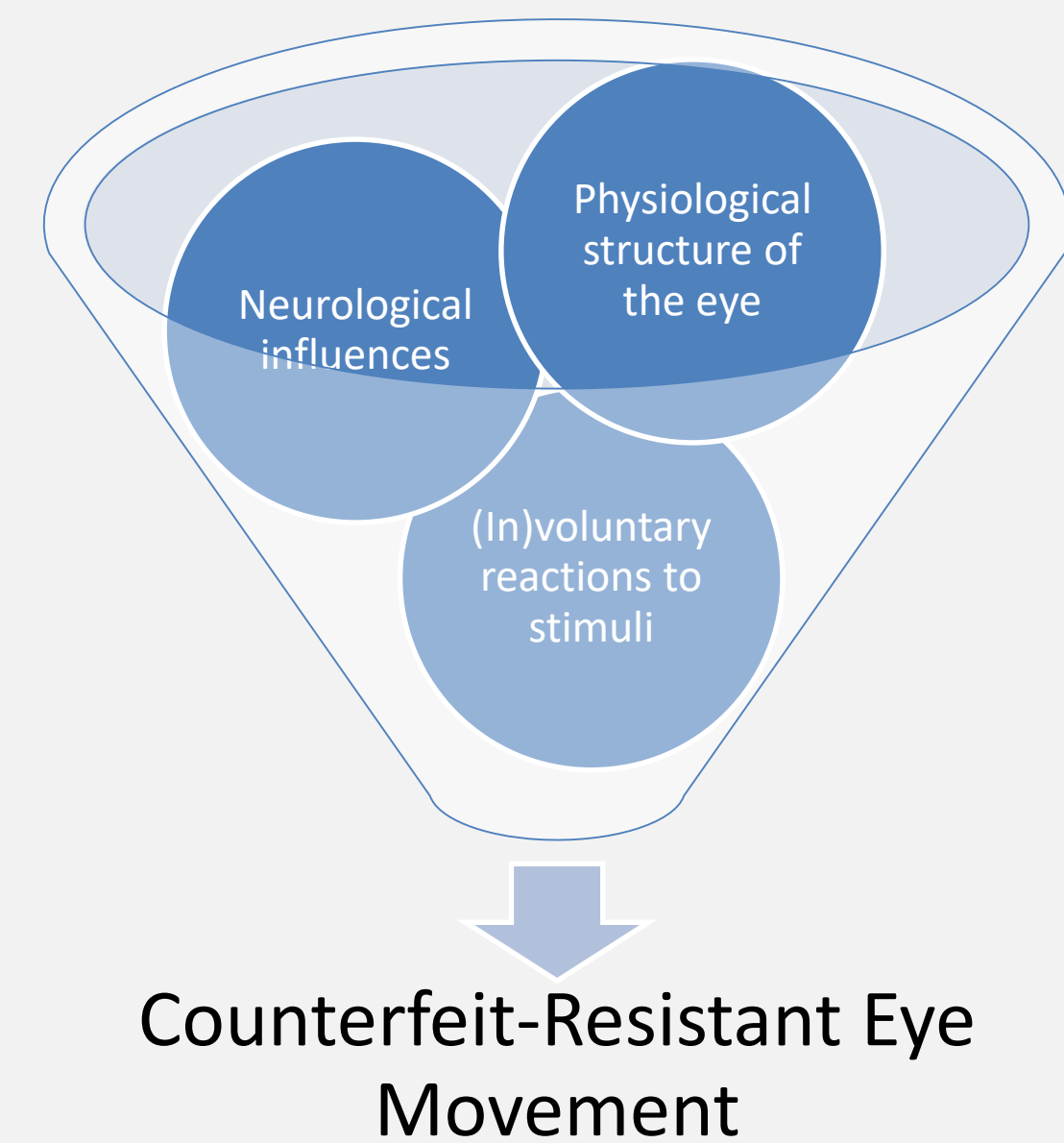
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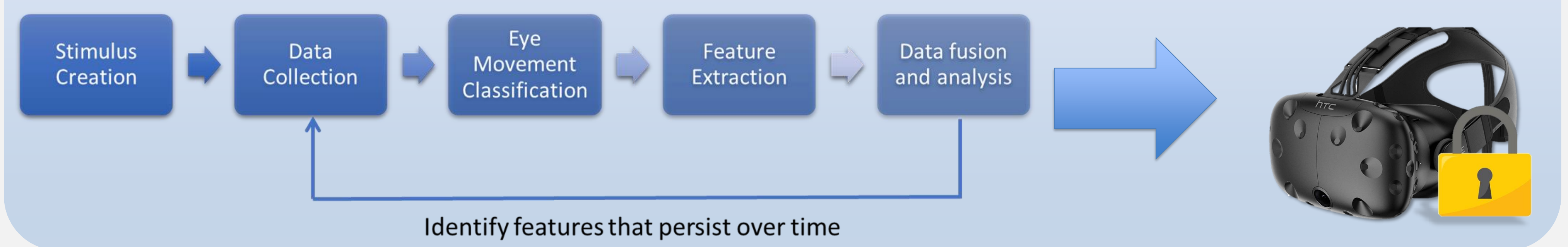


Background

Virtual reality (VR) and other wearable computing technology is slated to emerge as the dominant human-computer interaction device within the next decade. The emergence of this technology becomes problematic when considering that the need for a robust security implementation specifically for this platform has gone largely unaddressed. We propose that biometric authentication via eye movement is a suitable form of access control for VR, based on the counterfeit-resistant nature of eye movement and predicted ubiquity of embedded eye tracking technology within VR devices.



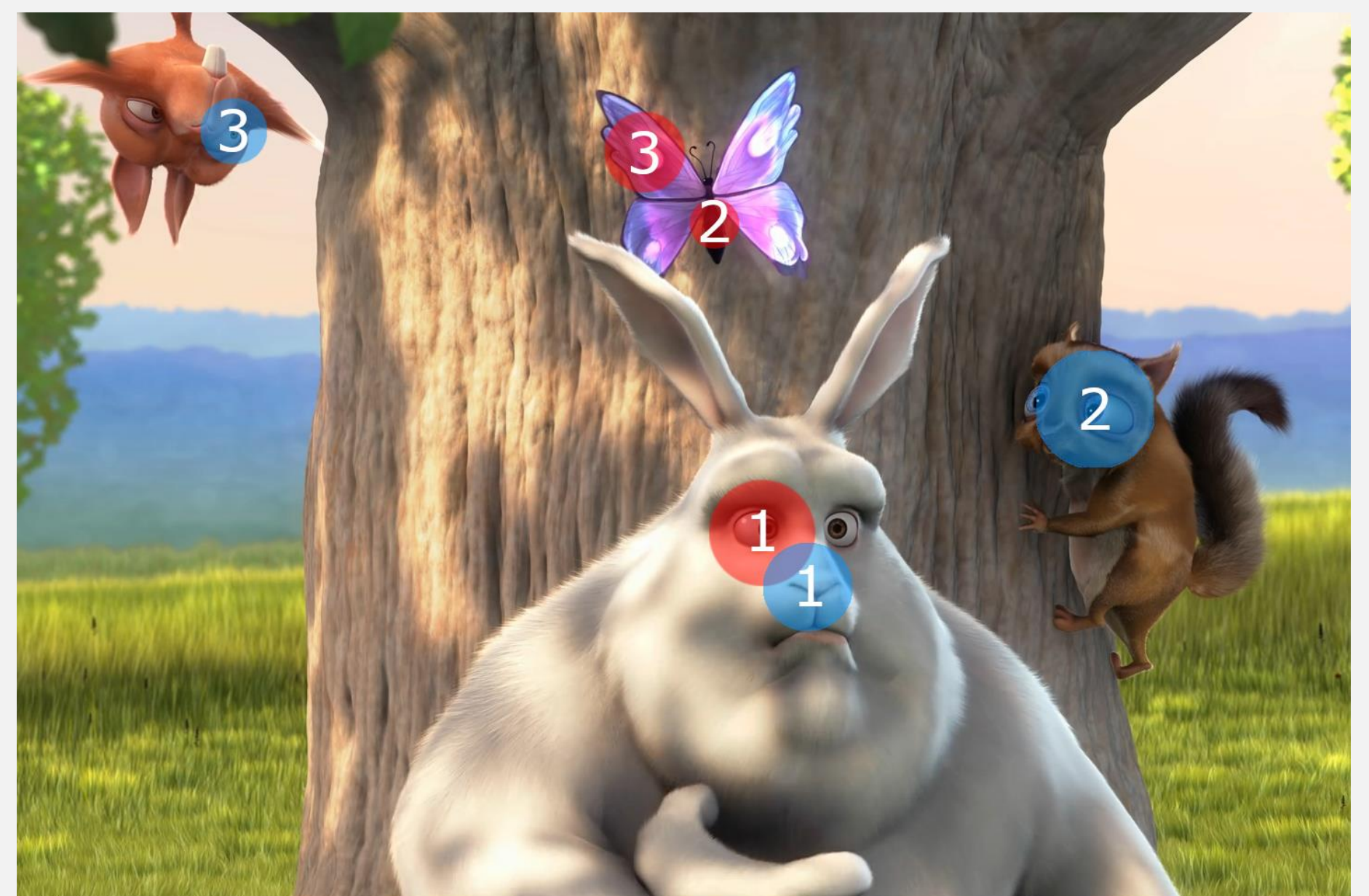
Research Pipeline



Solution

Keys for adapting biometric authentication for VR:

- Take advantage of VR's 3D eye movement capability.
- Accounts for power limitations.
- Elicit eye movements in a natural environment.
- Develop identification procedures with current sensor capabilities in mind.
- Standalone vs embedded eye trackers



Individual differences in a participant's focus and visual response to changing stimuli can be used to identify them.

Broader Impacts

Increased National Security

- Natural engagement with authentication procedures
- Empower people to take active role in securing sensitive data.

Research and Education

- Openly disseminate an extensive eye movement dataset.
- Encourage interdisciplinary collaboration (e.g. health assessment).

Large-Scale Impact

- VR headset ownership will breach 100 million by 2023 (Forbes, 2019).
- Variety of applications that require secure, trustworthy cyberspace.

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