



Learning Goals

- Understand what we mean by 'steering through a tunnel'
- Know the differences between Fitts' Law and Steering Law
- Being able to determine the time to steer through a tunnel

🝋 Audacity



Steering through Tunnels





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Bartholomay, A. F., Karreman, G., & Landahl, H. D. (1972). Obituary of Nicolas Rashevsky. Bull. Math. Biophys, 34, 1.

By Deva Darshan from https://www.pexels.com/photo/aerial-view-of-road-in-the-middle-of-trees-1173777 (PD)

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Niels Henze



Accot, J., & Zhai, S. (1997). Beyond Fitts' law: models for trajectory-based HCI tasks. CHI'97

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What is easier, steering through a tunnel or target selection?



Steering through Tunnels



How to change Fitts' Law to model steering tasks?

$$MT = a + b \qquad \left(1 + \frac{D}{W}\right)$$

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(Accot–Zhai) Steering Law

$$MT = a + b\frac{D}{W}$$

Accot, J., & Zhai, S. (1997). Beyond Fitts' law: models for trajectory-based HCI tasks. CHI'97

(Accot–Zhai) Steering Law

 $MT = a + b\frac{D}{W}$



By Kearniel from https://commons.wikimedia.org/wiki/File:Sh uminprofile.png (CC BY-SA 4.0)

From: http://www.amisducena.fr 'authors/accot_johnny.shtml

Steering Law Definition

$$MT = a + b\frac{D}{W} \quad \mathsf{ID} = \frac{D}{W}$$

- The movement time (MT) to acquire a target through a tunnel is a function of the length (D) and width (W) of the tunnel. It depends on the input device.
- MT: movement time
- a and b: constants dependent on the pointing system
- D: distance, i.e. length of the tunnel
- W: width of the tunnel

Steering Law Extensions

$$MT = a + b\frac{D}{W}$$



$$MT = a + b \int_C \frac{ds}{W(s)}$$

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Yamanaka, S., Stuerzlinger, W., & Miyashita, H. (2018, April). Steering through successive objects. CHI'2018.

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Zhai, S., Accot, J., & Woltjer, R. (2004). Human action laws in electronic virtual worlds: an empirical study of path steering performance in VR. Presence: Teleoperators & Virtual Environments, 13(2), 113-127.

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Accot, J., & Zhai, S. (1997). Beyond Fitts' law: models for trajectory-based HCI tasks. CHI'97

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