

# Pointing at Perspective Scaled 3D Targets

Robert J. Teather

Wolfgang Stuerzlinger



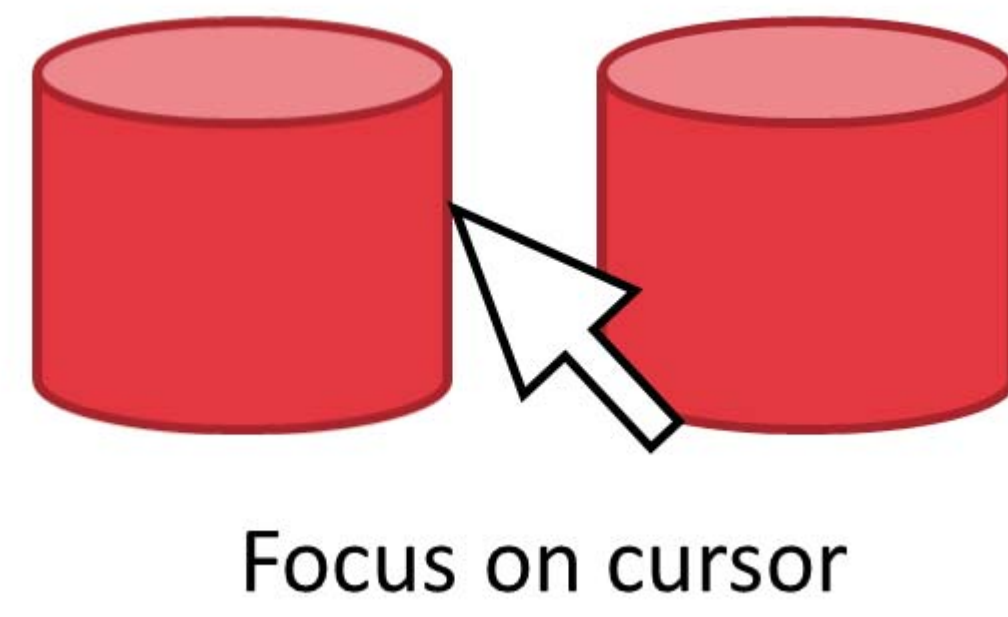
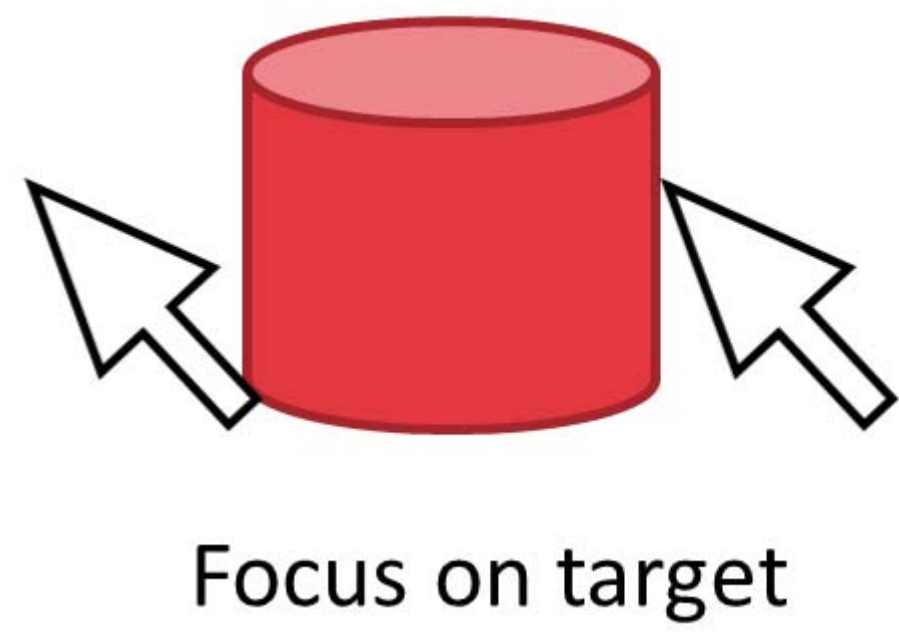
Department of Computer Science and Engineering  
York University, Toronto, Canada

{rteather, wolfgang}@cse.yorku.ca

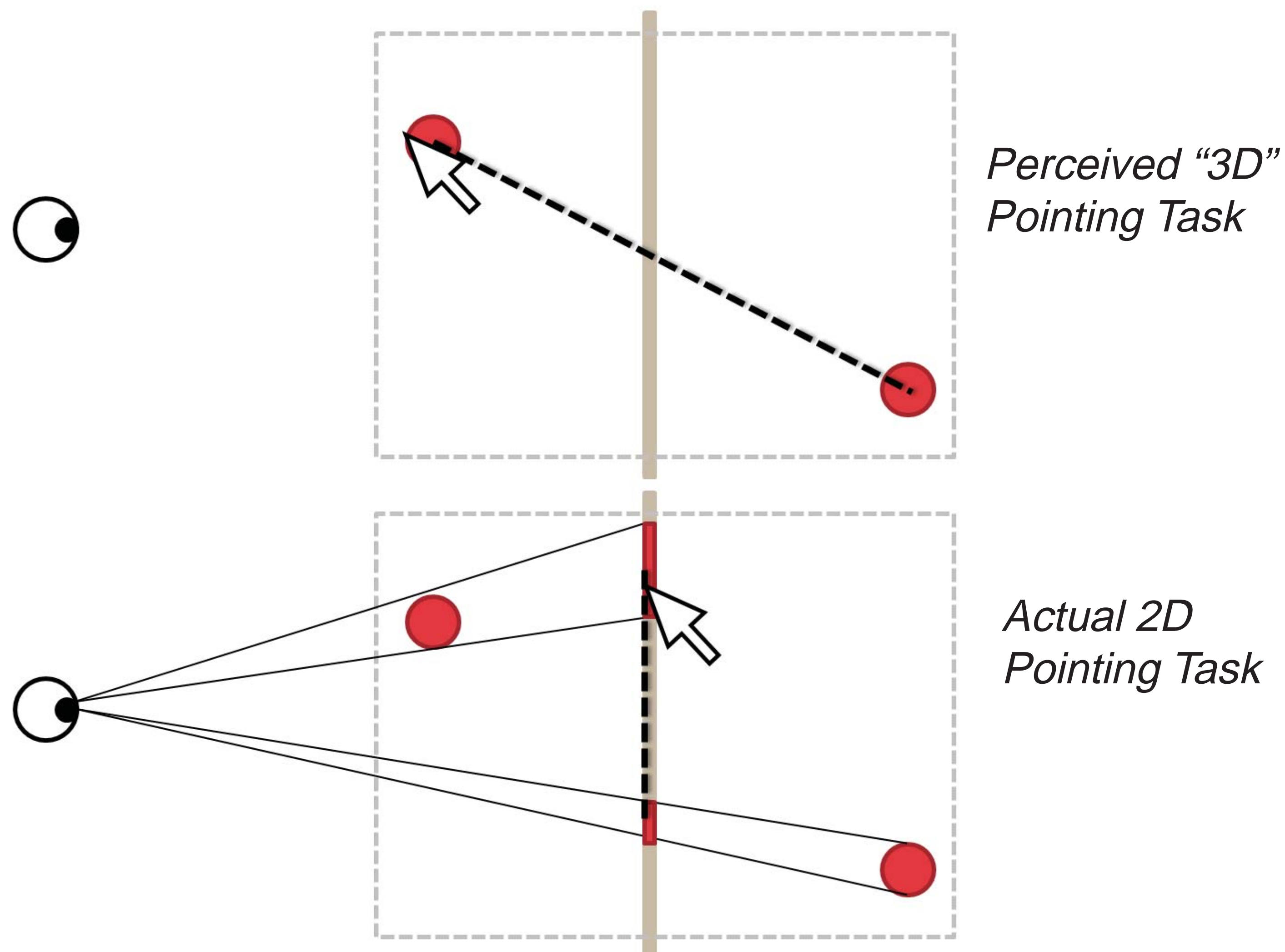


## Motivation

- Stereo cursors and diplopia vs. one-eyed cursor

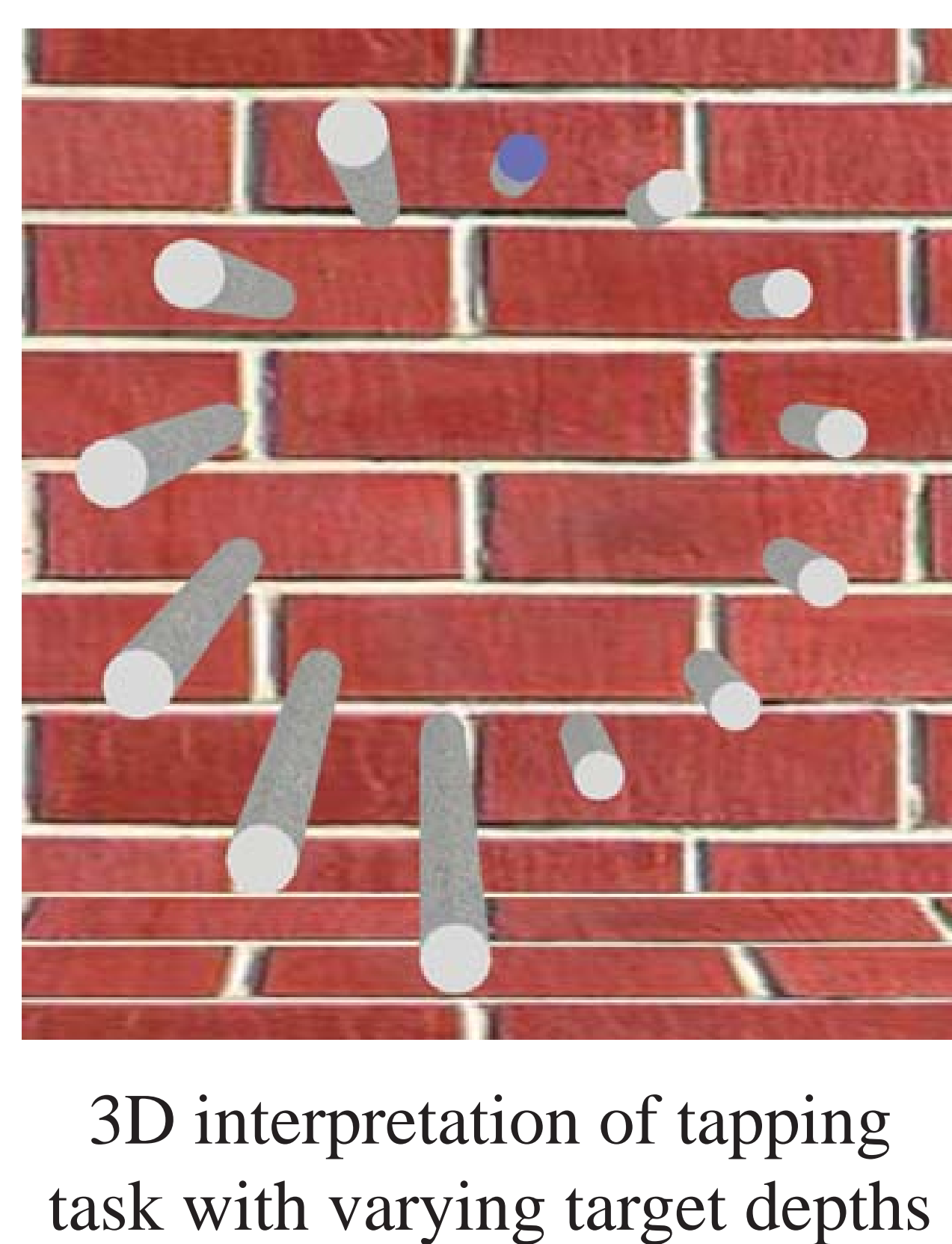
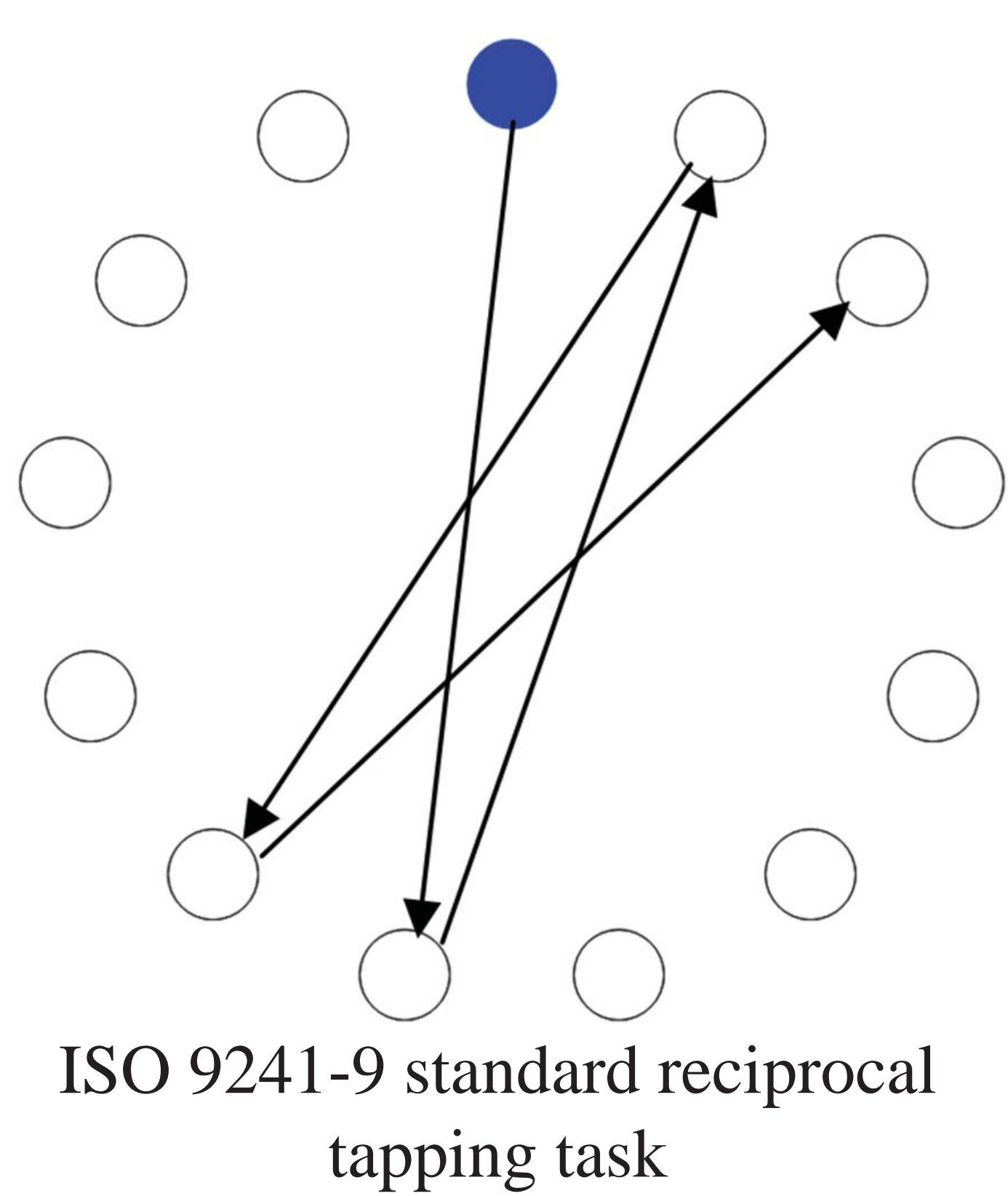


- Investigate “screen plane” pointing

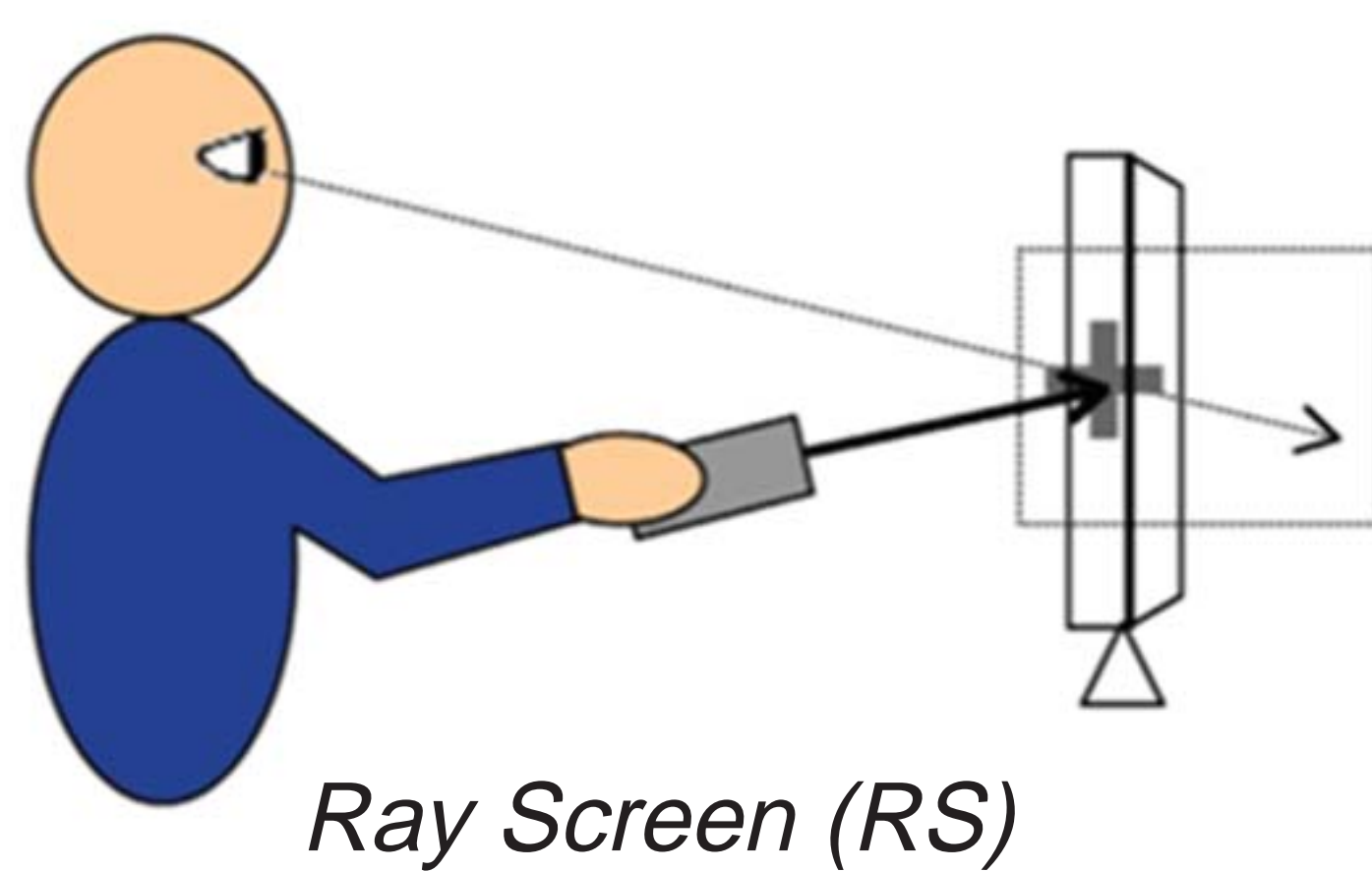
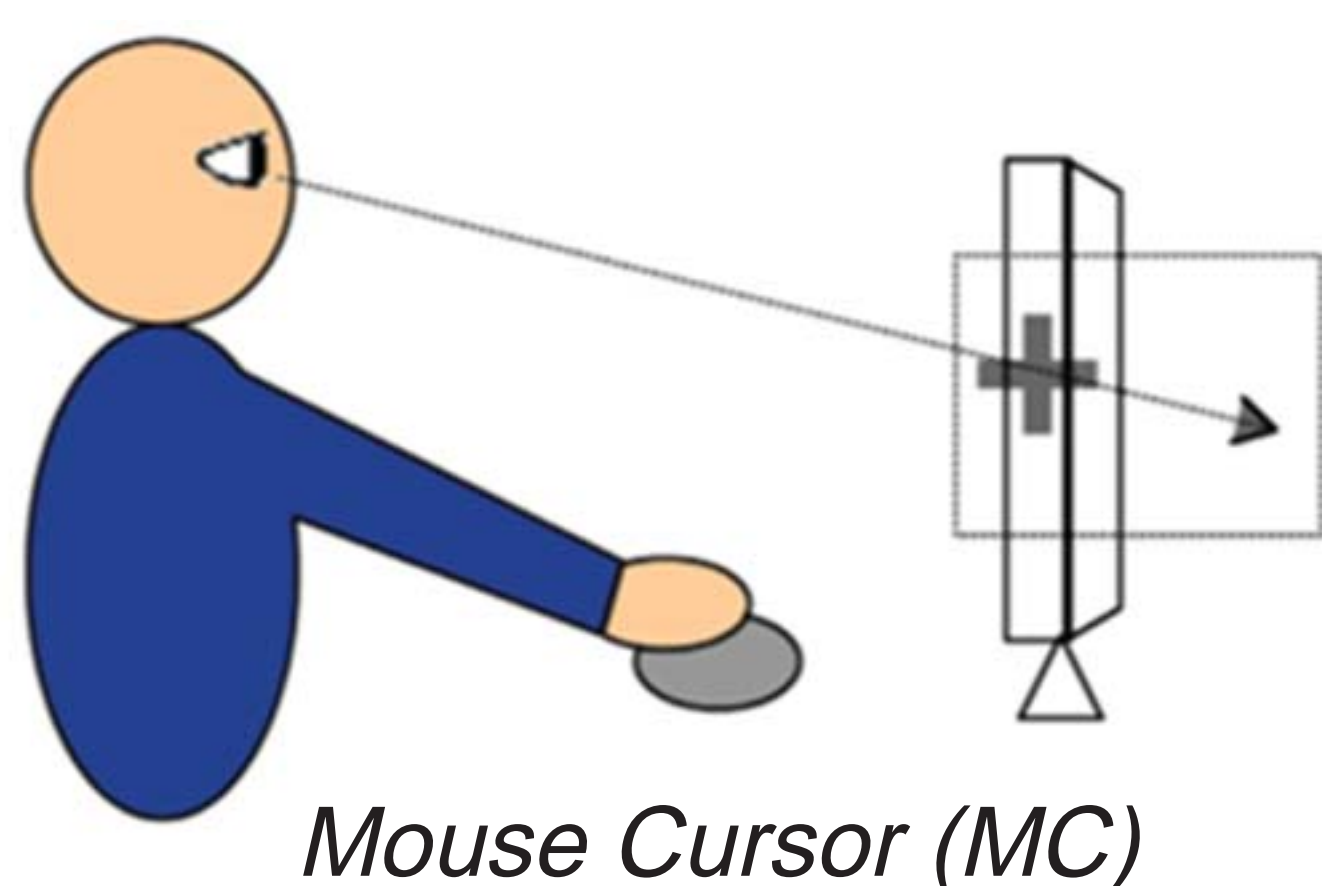


## Evaluation

- ISO 9241-9 - throughput, effective measures



- Calculated Fitts law parameters in screen-space
- Compared two screen plane pointing techniques



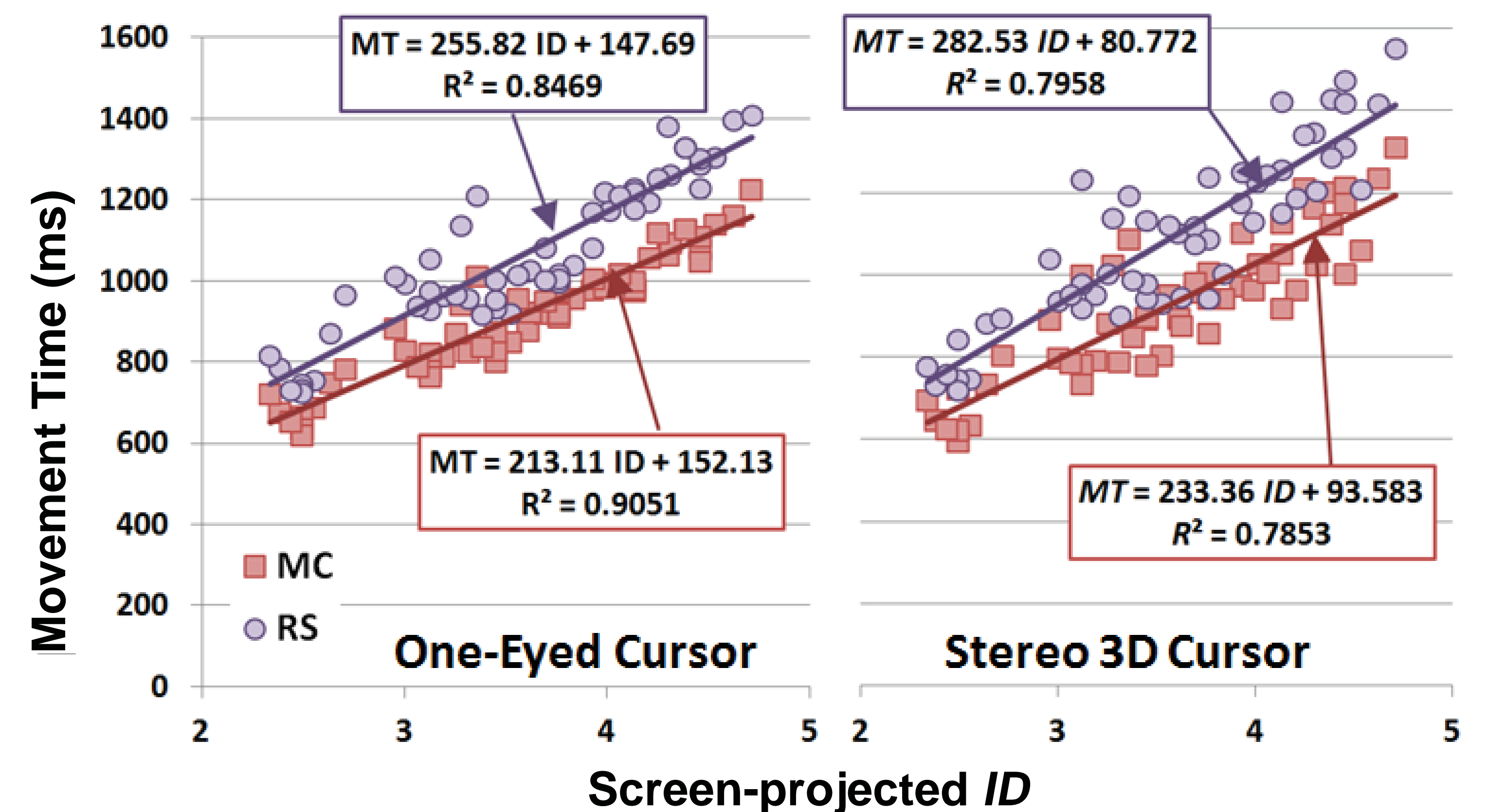
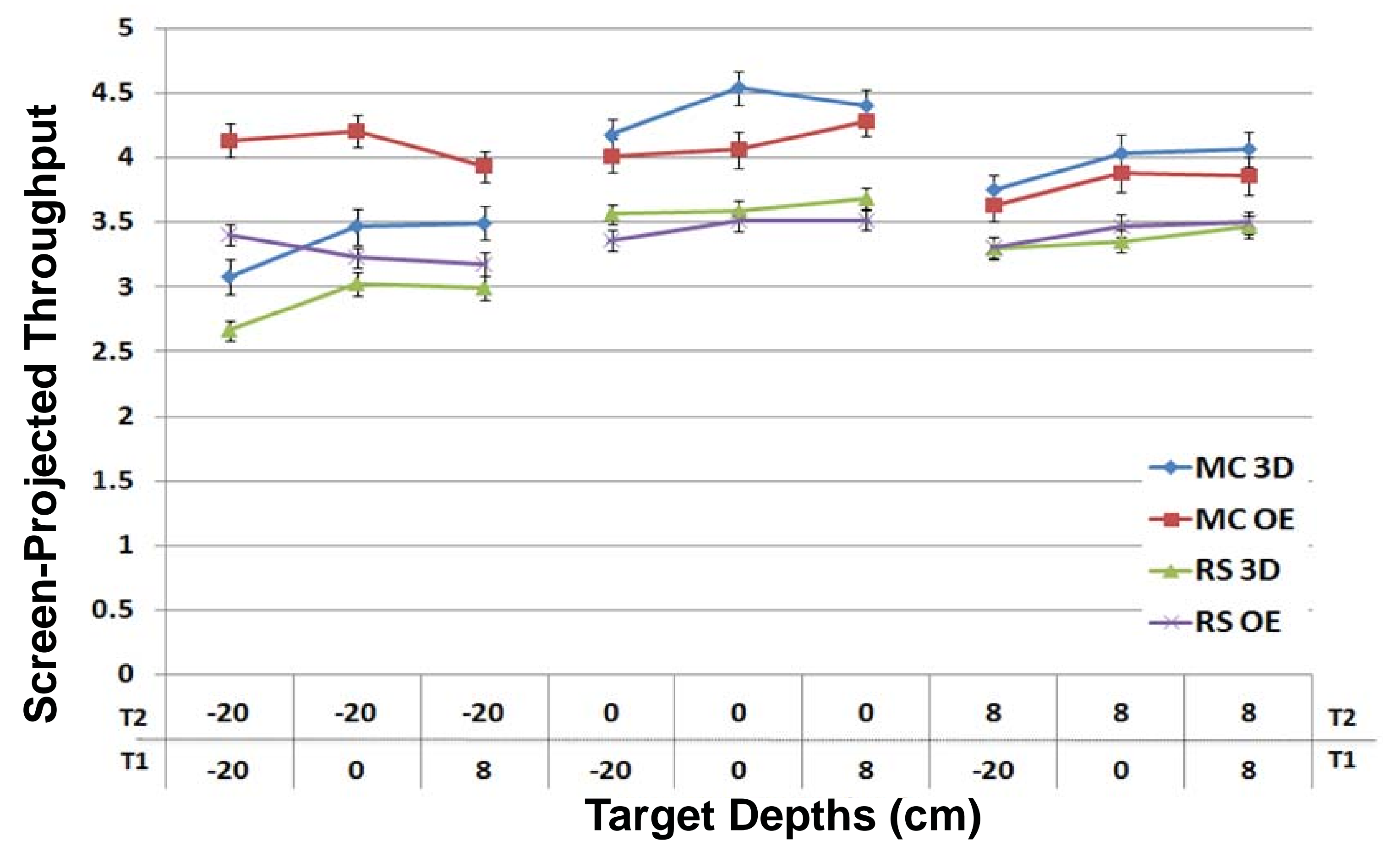
- Both tested with one-eyed and stereo cursor

## Experiment Setup

- 12 participants
- Used 24” widescreen stereo display, no head-tracking
- Tracked remote pointer with Optitrack
- All combinations of three target depths (+8, 0, -20 cm from display)
- Cursor displayed either one-eyed (OE) or stereo (3D)
- Results via repeated measures ANOVA

## Results

- Mouse best overall, ~ 4bps
- One-eyed cursor eliminates diplopia
- Screen throughput consistent over depths
- Screen ID produces reasonable models



## Conclusions

- Screen pointing techniques should be modeled using 2D parameters
- Screen ID produces reasonable models - not perfect (stereo issues?)
- Screen throughput insensitive to depth when using one-eyed cursor
- One-eyed cursor eliminates negative impact of diplopia

## For full details...

Please see our CHI 2013 paper  
*Pointing at 3d Target Projections with One-Eyed and Stereo Cursors*