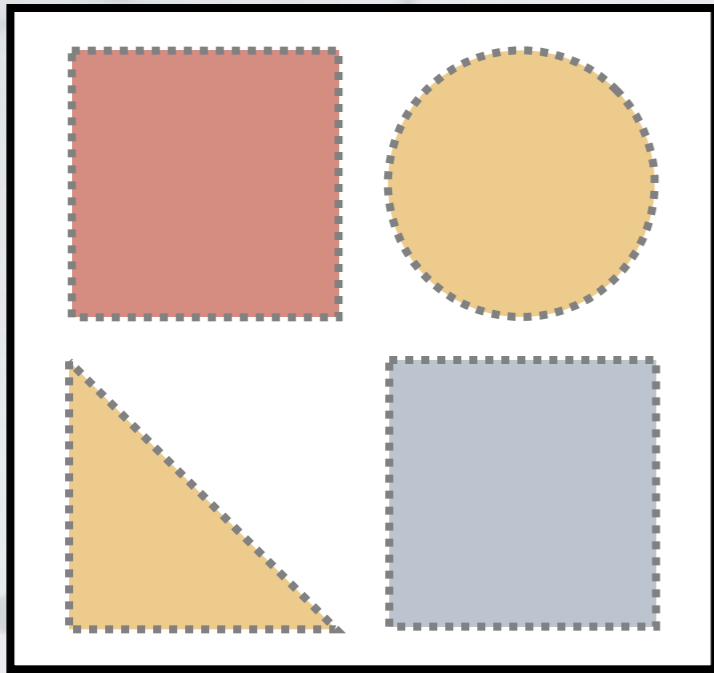


# Quantifying Object- and Command-oriented Interaction

Alix Goguey<sup>1</sup>, Julie Wagner<sup>2</sup>, Géry Casiez<sup>3</sup>

<sup>1</sup>Inria, <sup>2</sup>University of Munich (LMU), <sup>3</sup>University of Lille





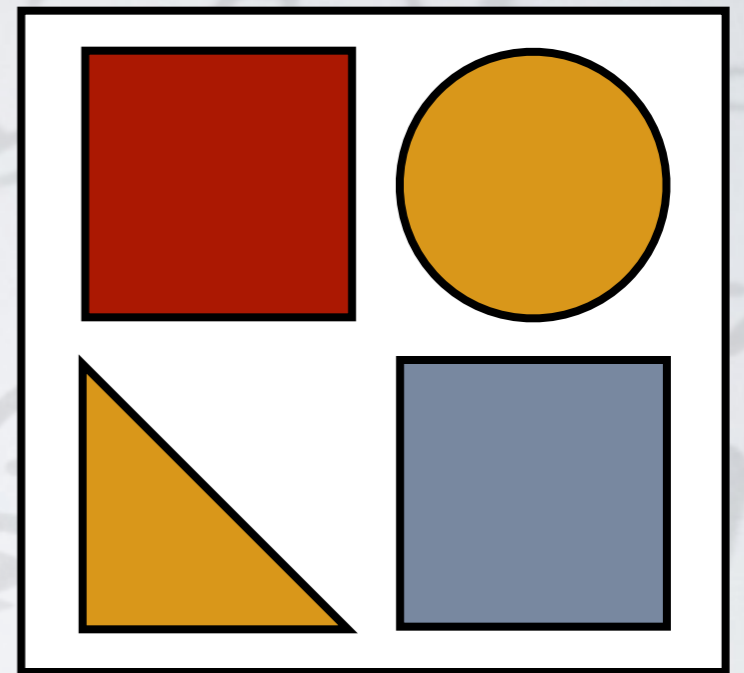
Task



Resolution



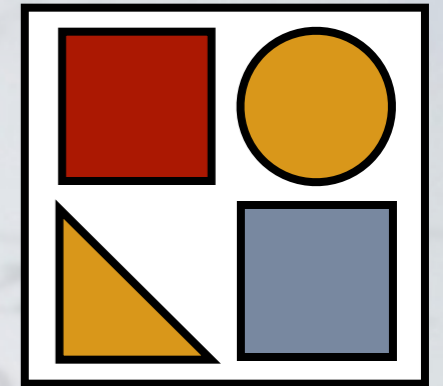
Strategy



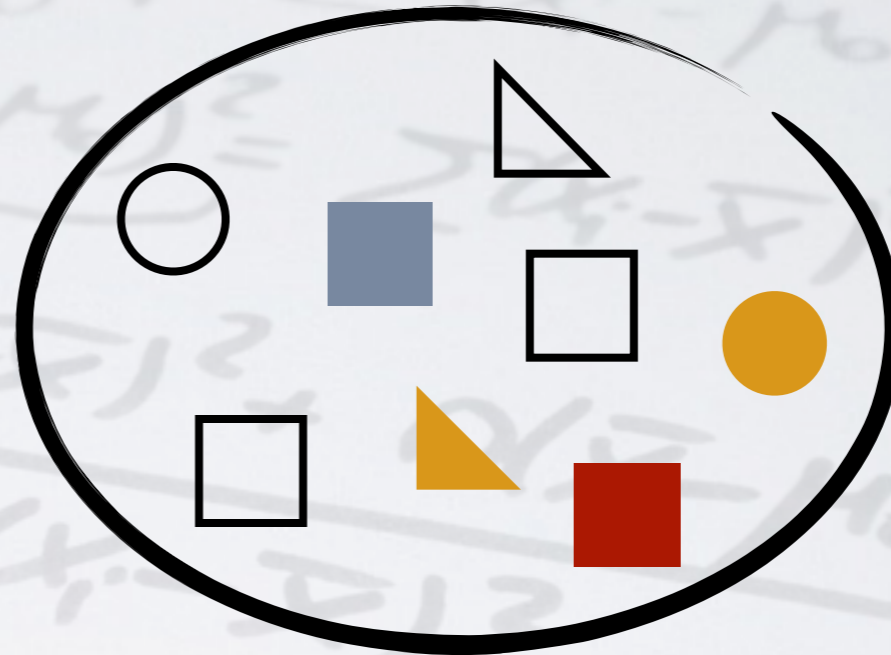
Result



# What is a strategy?



Elementary  
actions



S1

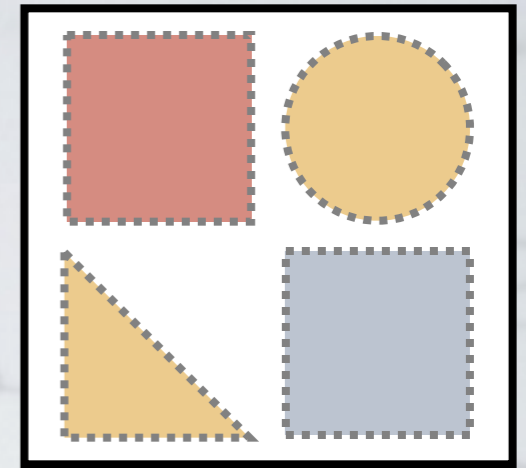


S2

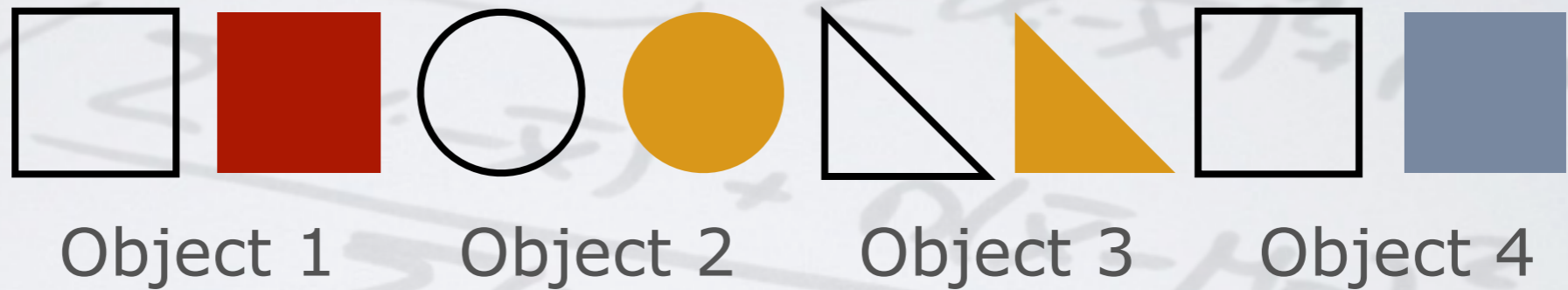


[Mackay AVI'02; Appert et al. 2005]

# Extremes



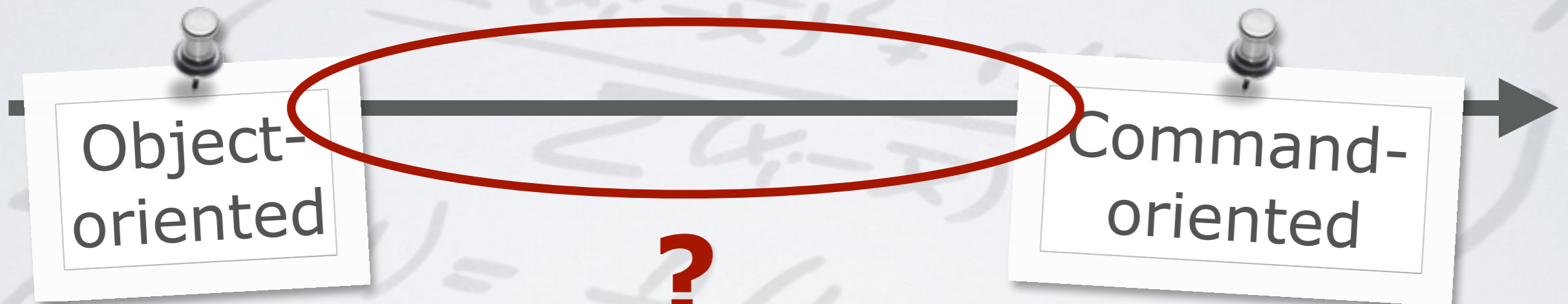
Object-oriented strategy



Command-oriented strategy



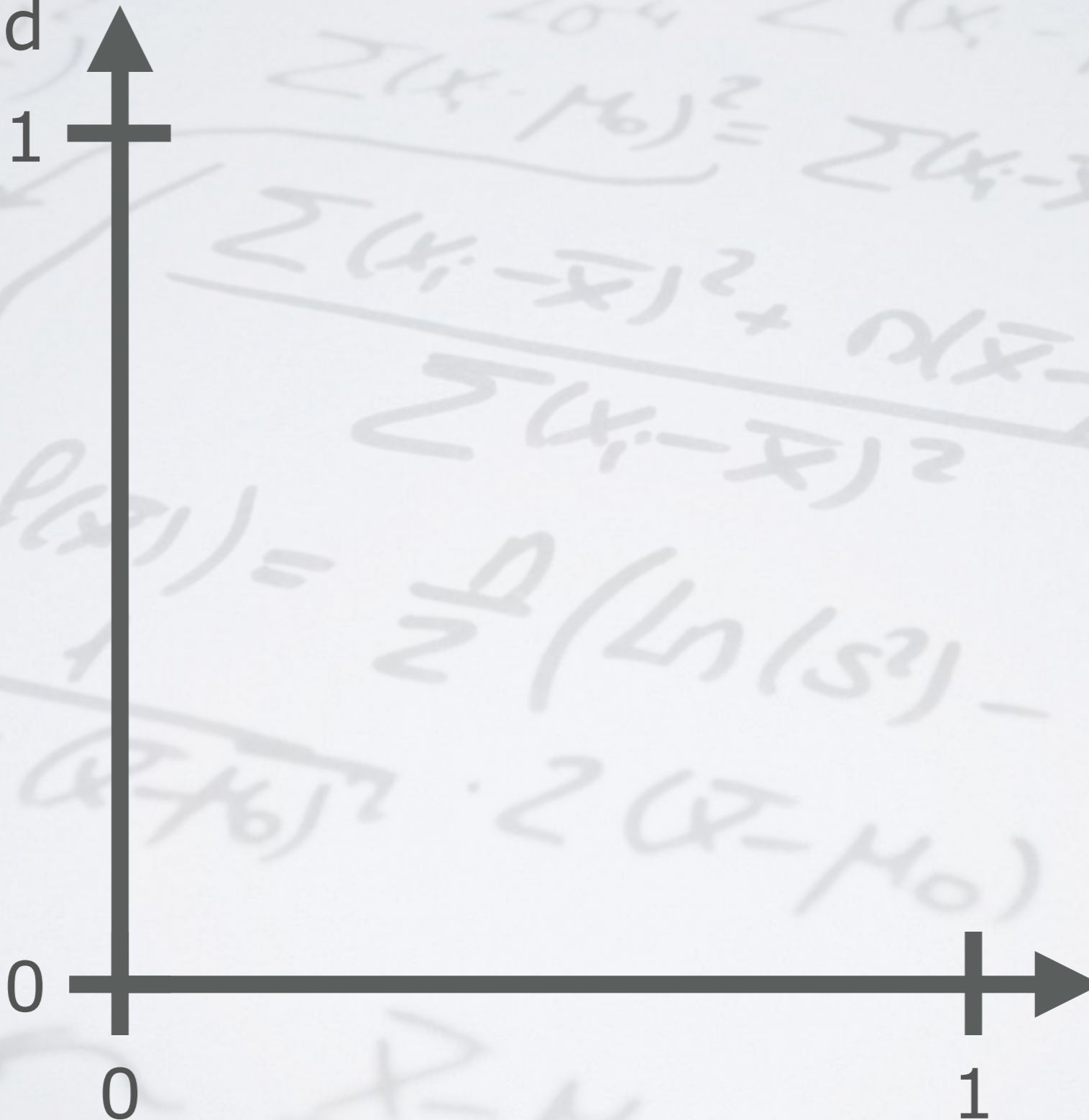
# Problems



...and subjective

# Our approach

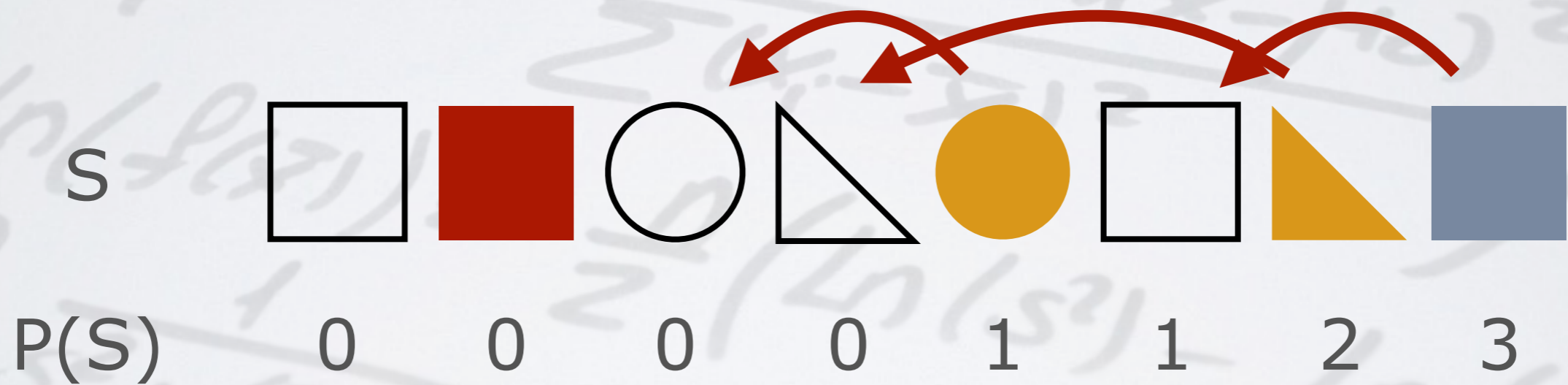
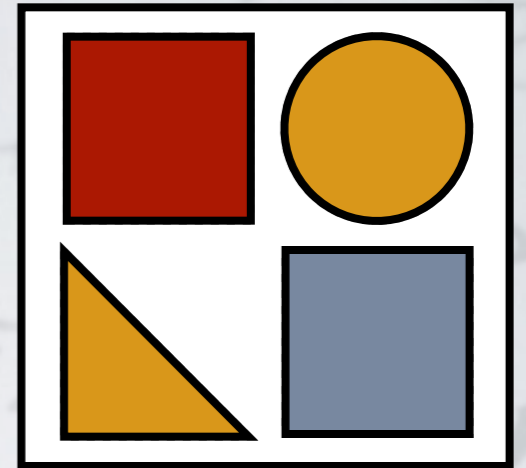
Object-oriented



Command-oriented

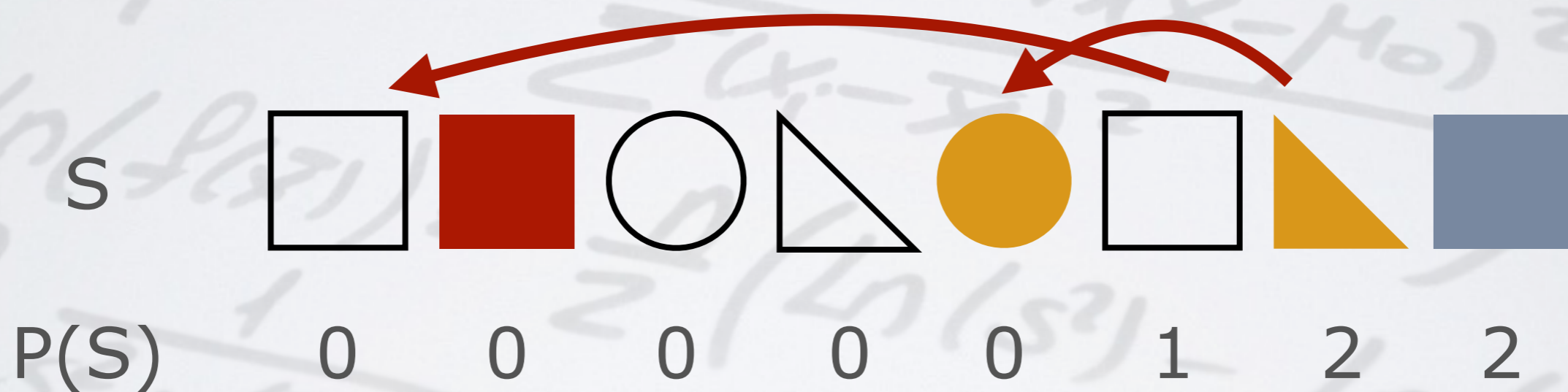
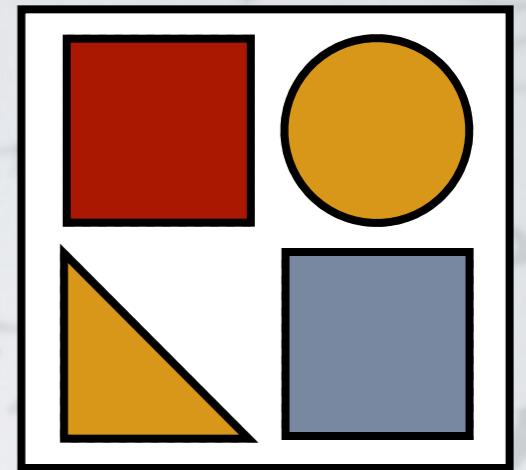


# Object-oriented metric



$$\text{ObjOri}(S) = 1 - \frac{P(S)}{\text{actions} - \text{objects}} = 0.25$$

# Command-oriented metric

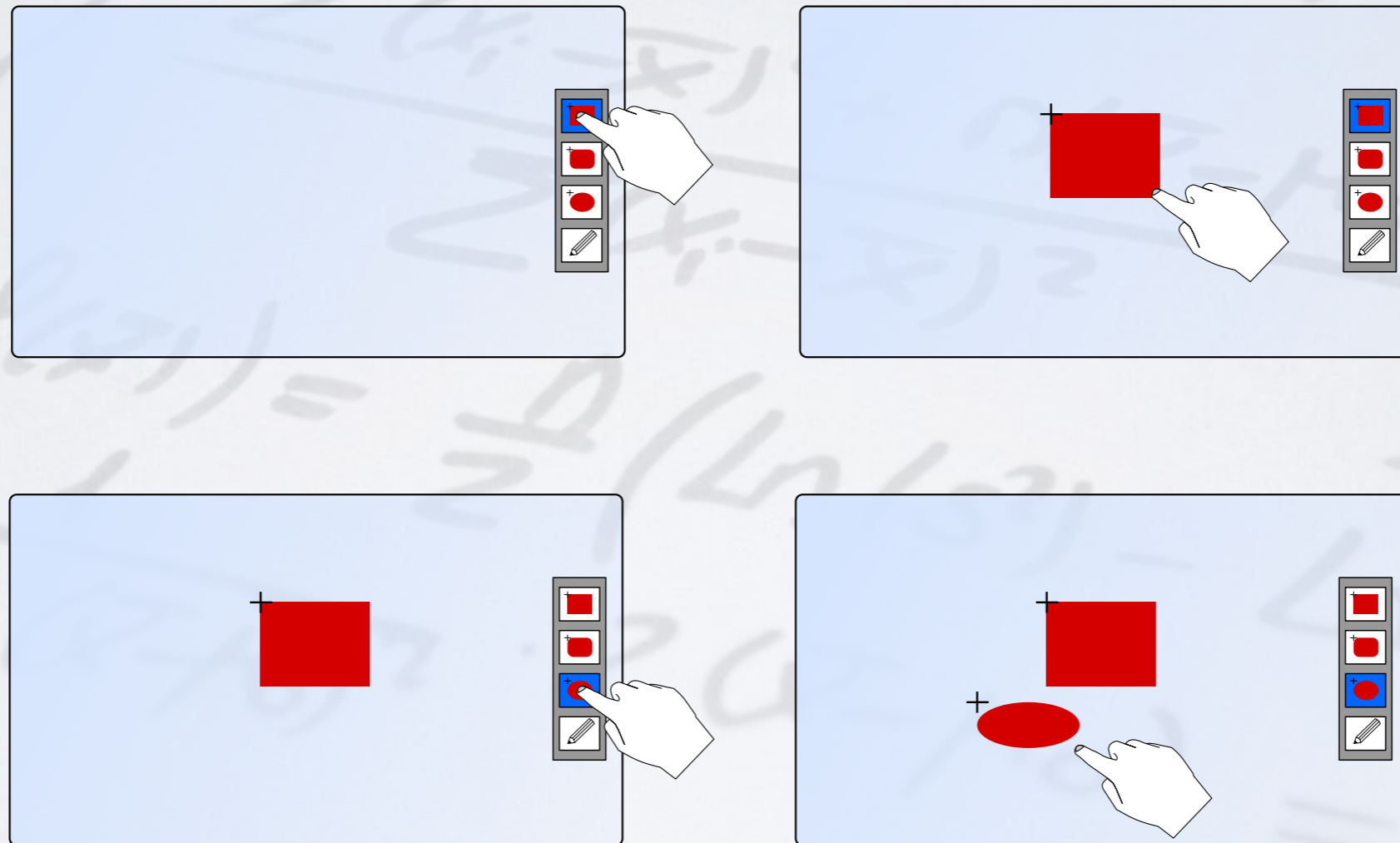


$$\text{CmdOri}(S) = 1 - \frac{P(S)}{\text{actions} - \text{commands}} = 0$$



# Experiment

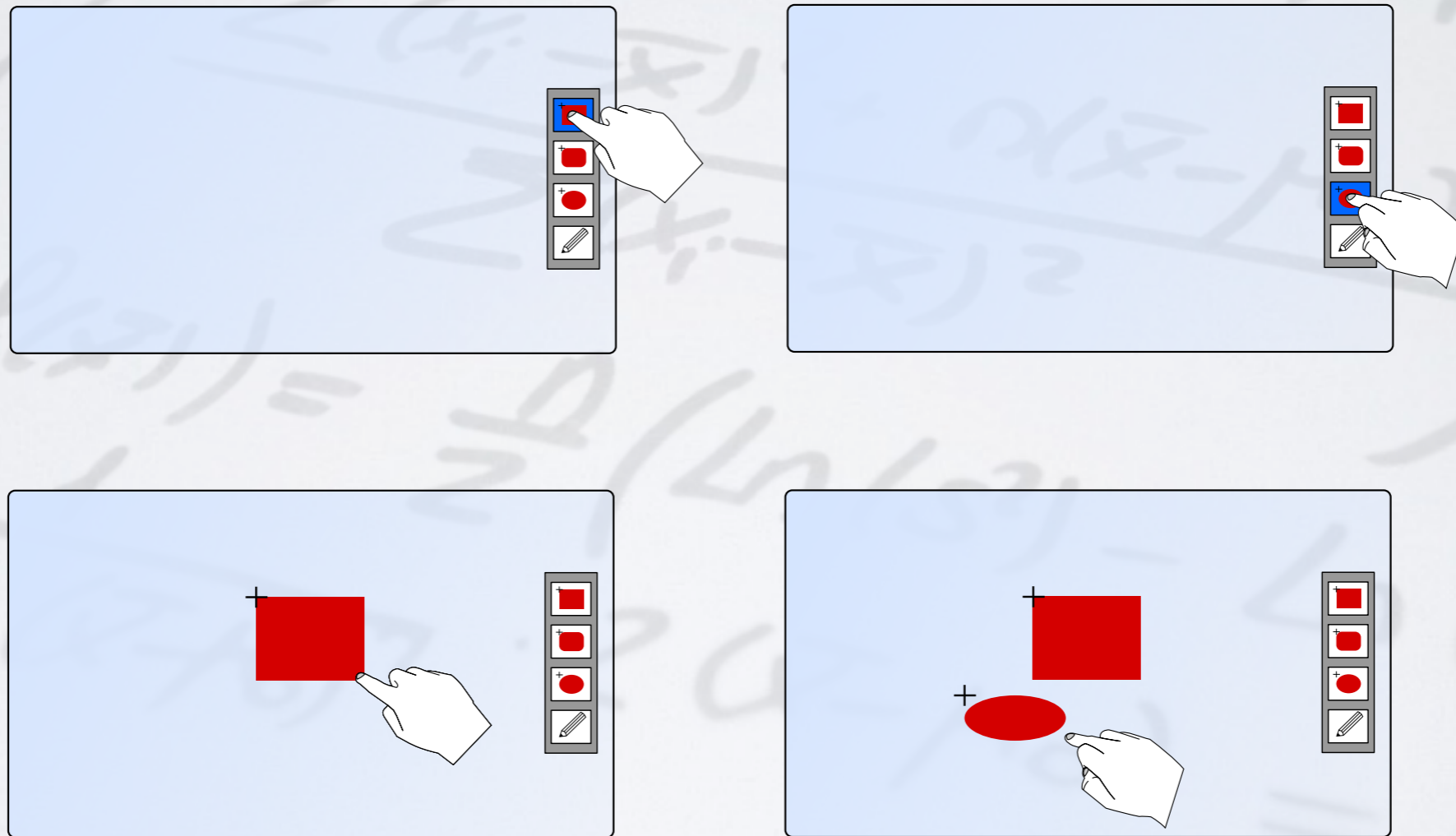
4 TECHNIQUES x 3 TASKS x 7 REPETITIONS



TECHNIQUE 1: Fixed Palette

# Experiment

4 TECHNIQUES x 3 TASKS x 7 REPETITIONS

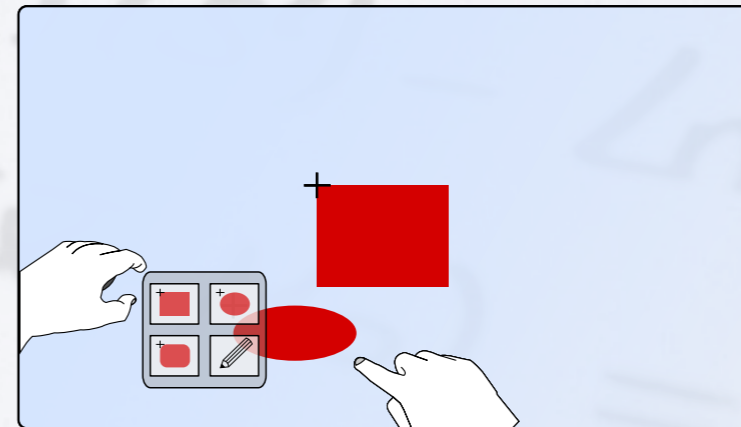
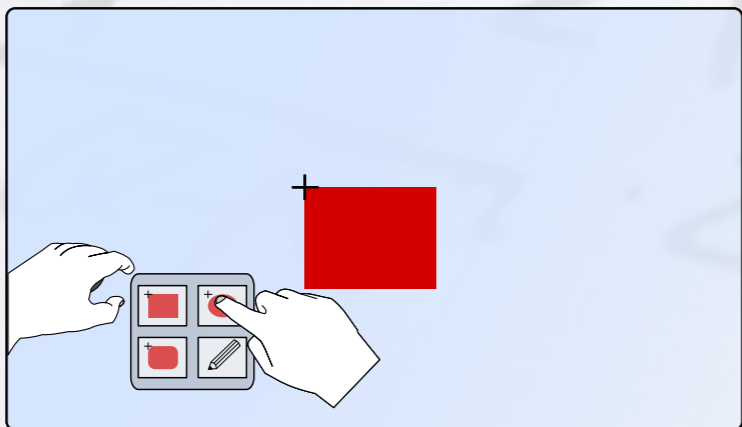
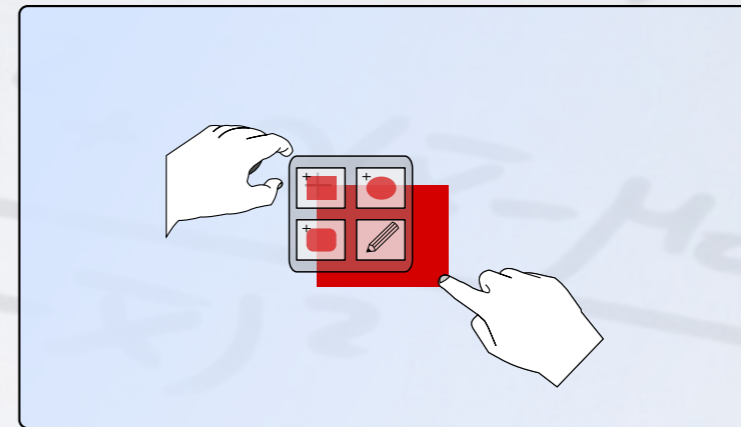
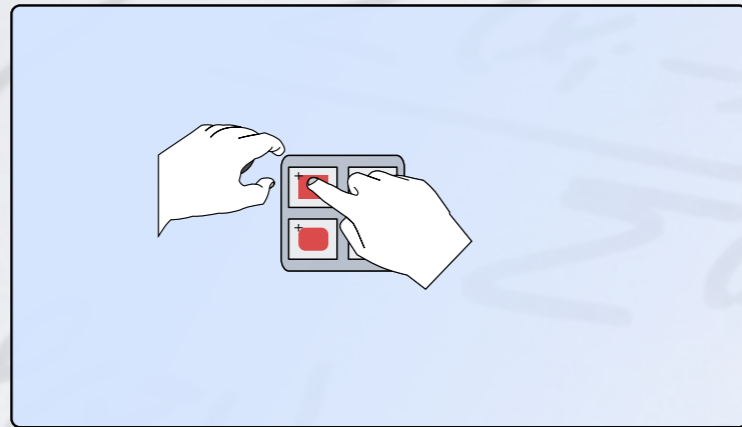


TECHNIQUE 2: Fixed Palette using Finger Identification



# Experiment

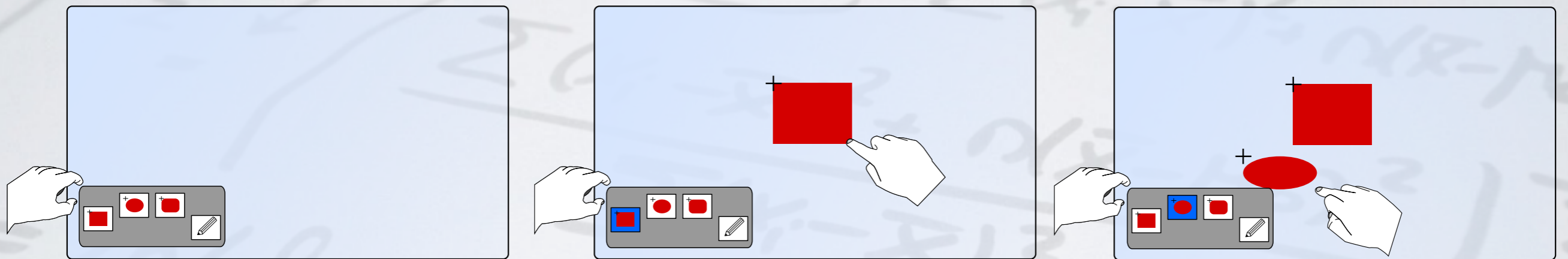
4 TECHNIQUES x 3 TASKS x 7 REPETITIONS



TECHNIQUE 3: Toolglass

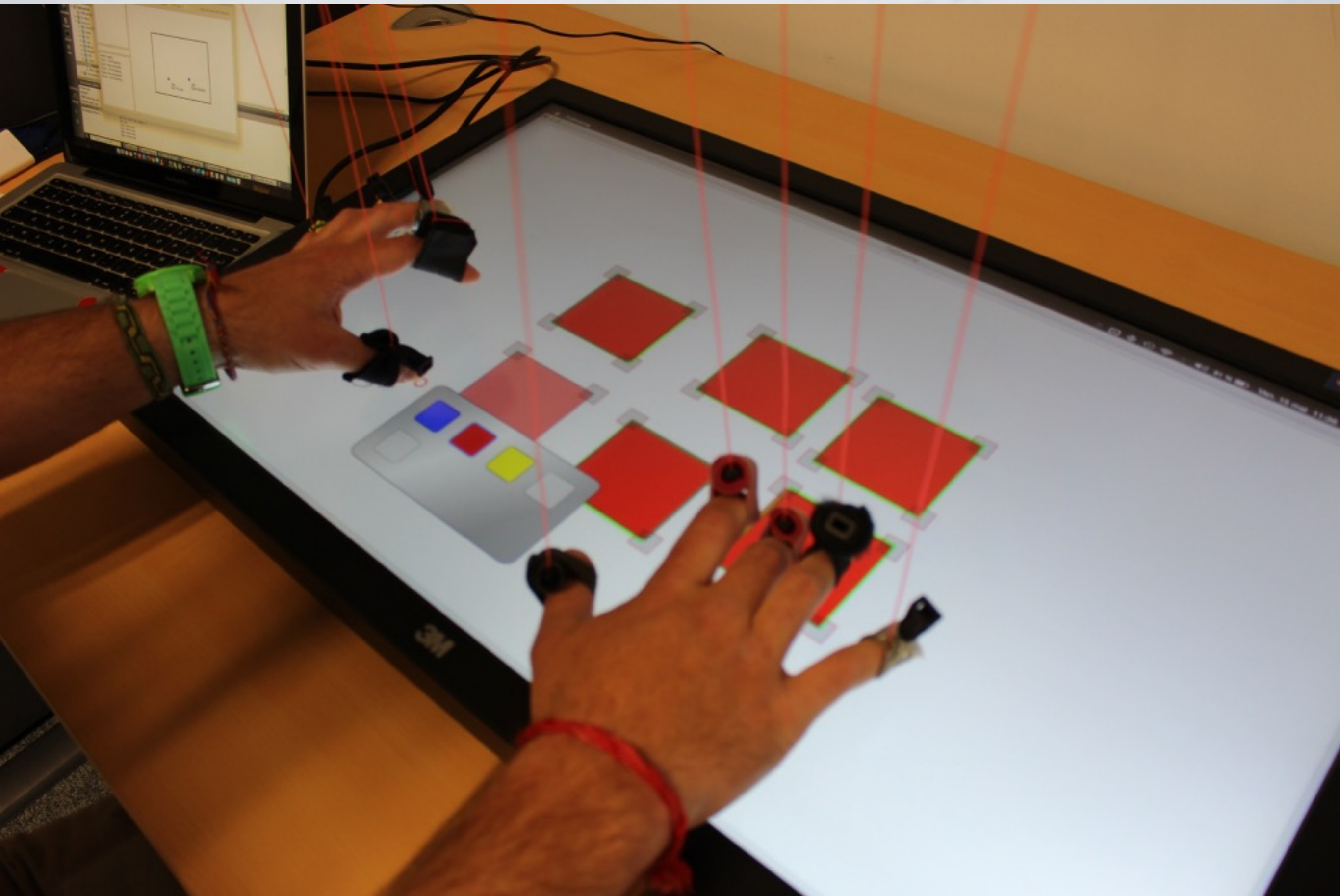
# Experiment

4 TECHNIQUES x 3 TASKS x 7 REPETITIONS

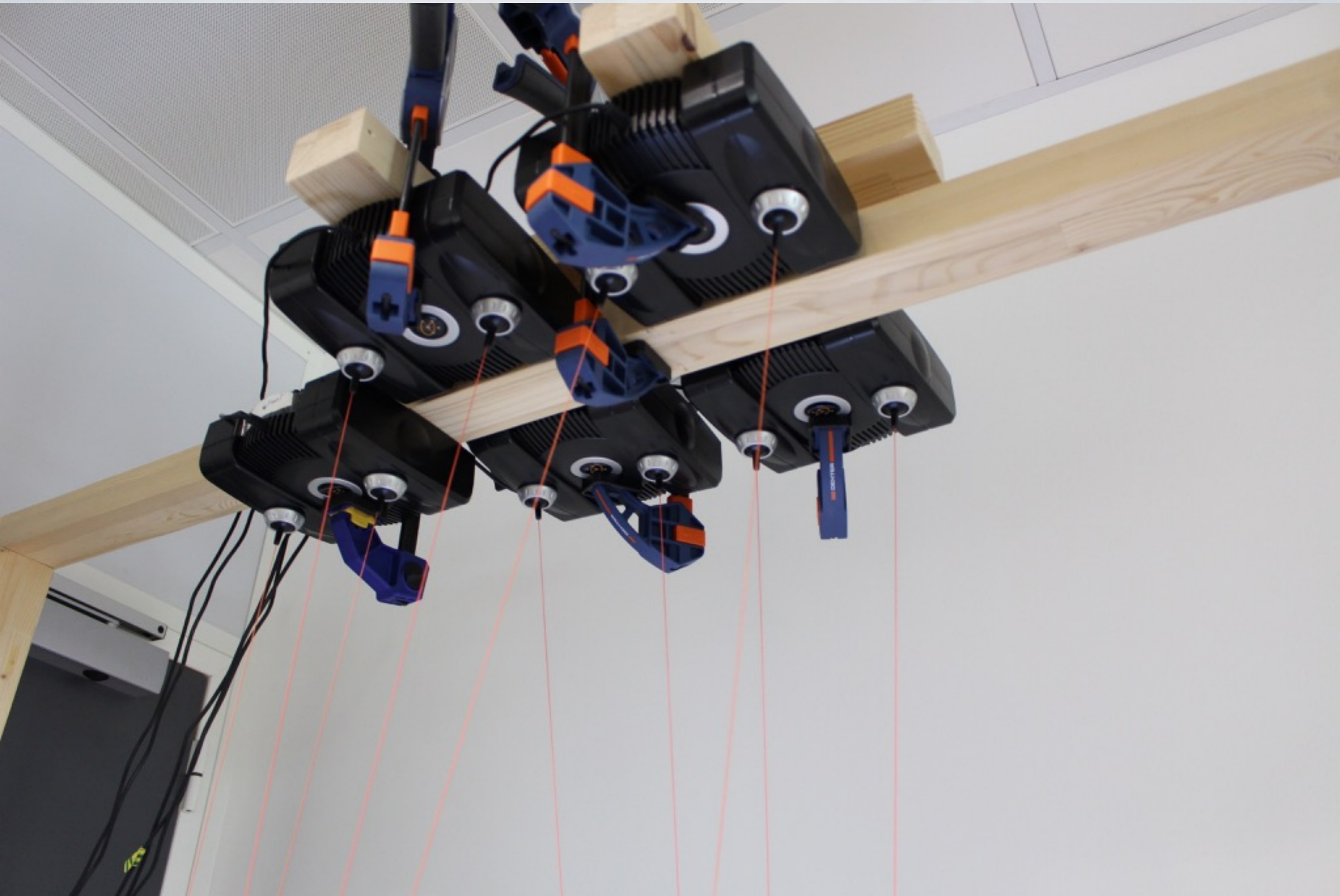


TECHNIQUE 4: Finger Palette





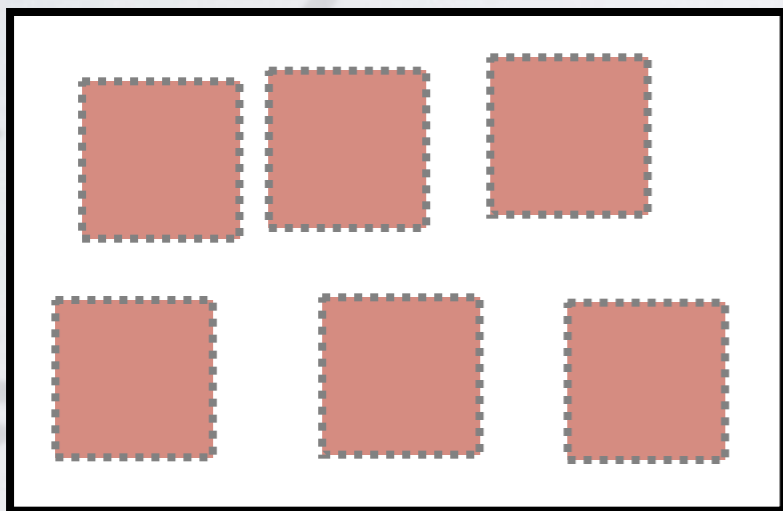




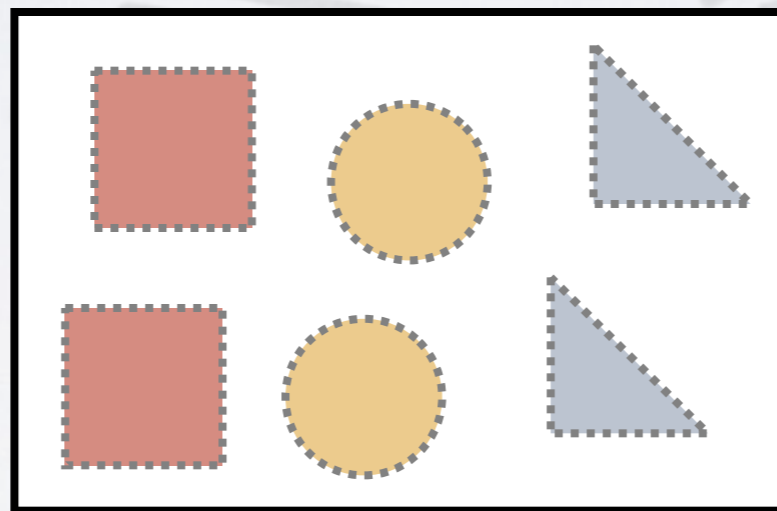


# Experiment

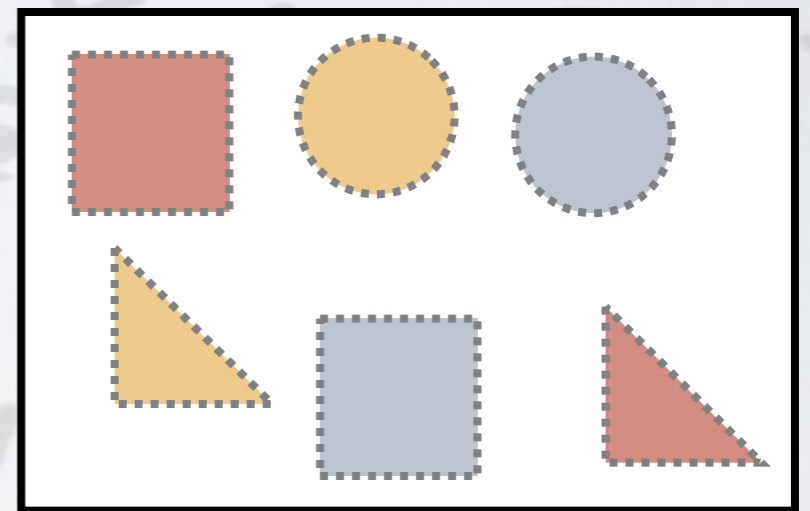
4 TECHNIQUES x 3 TASKS x 7 REPETITIONS



TASK 1

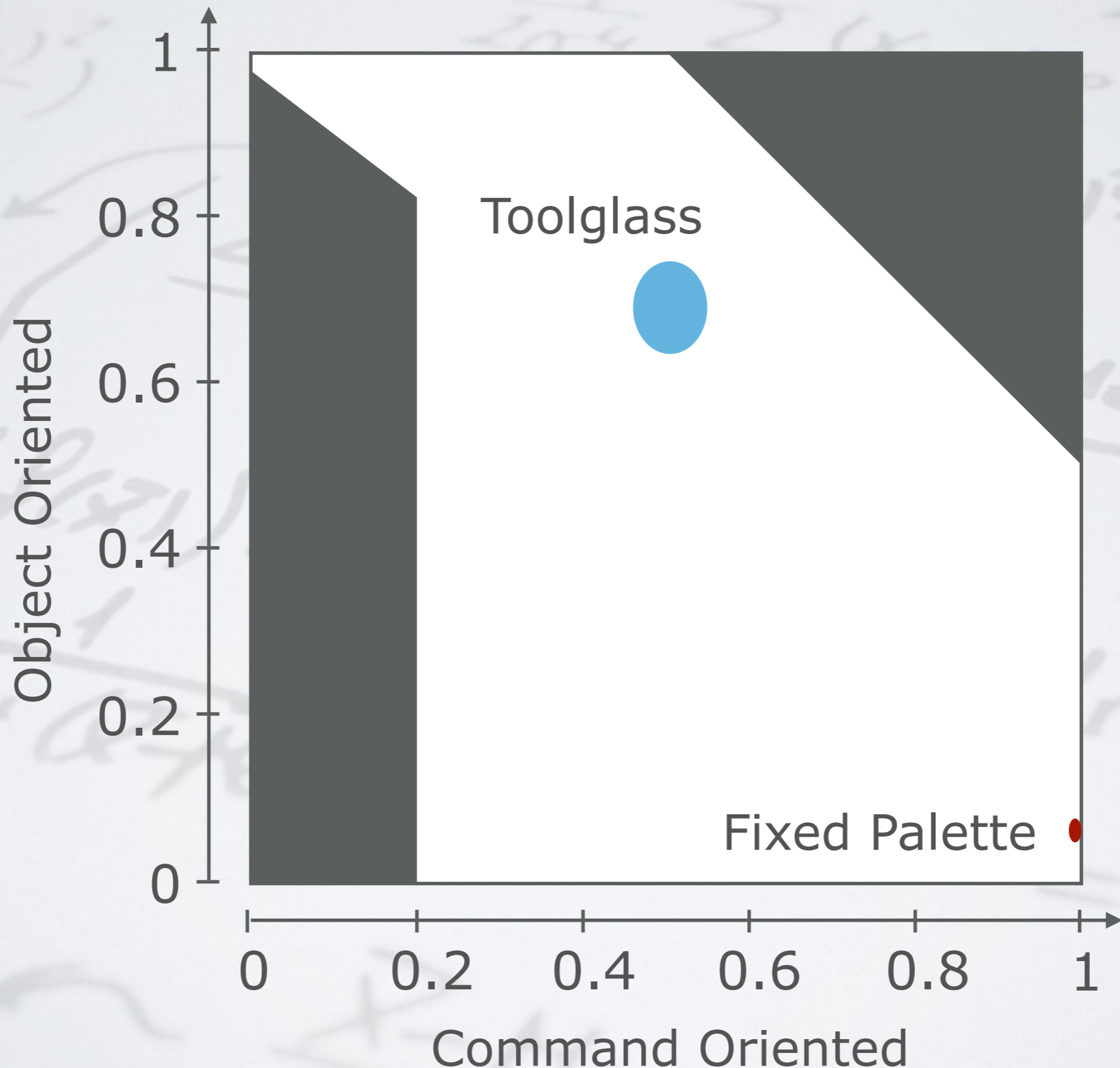


TASK 2



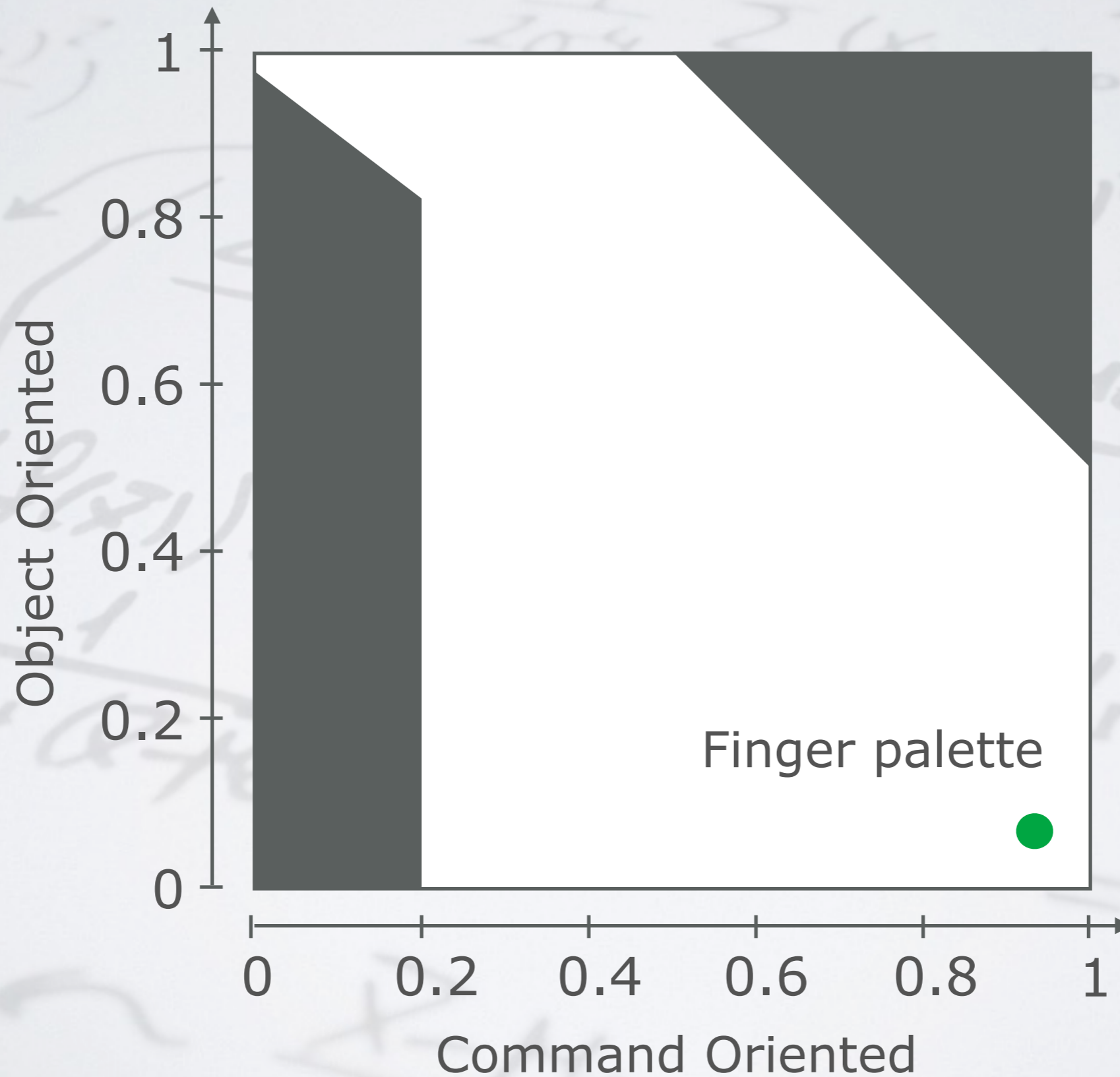
TASK 3

# Validation

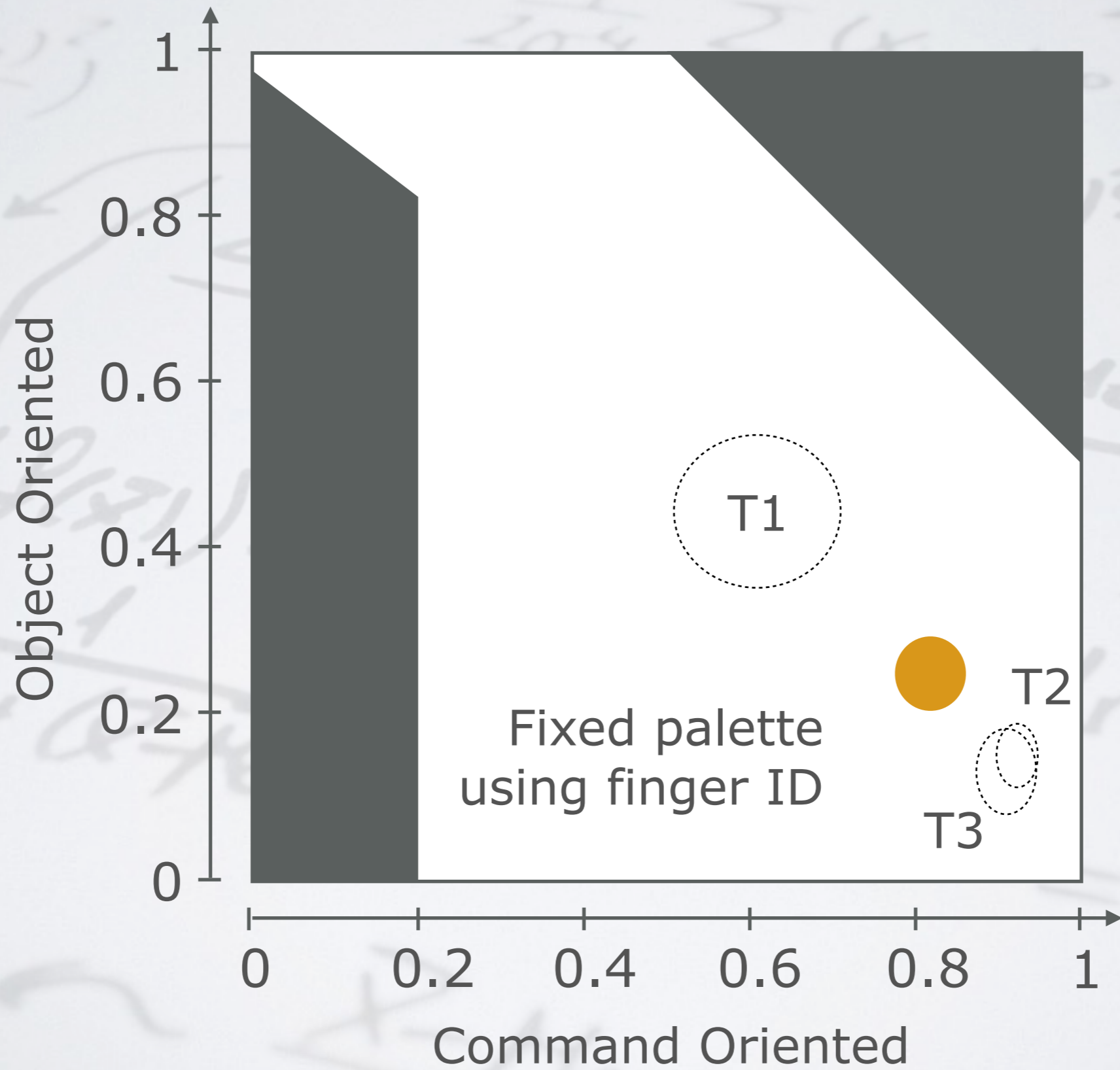




# Results



# Results

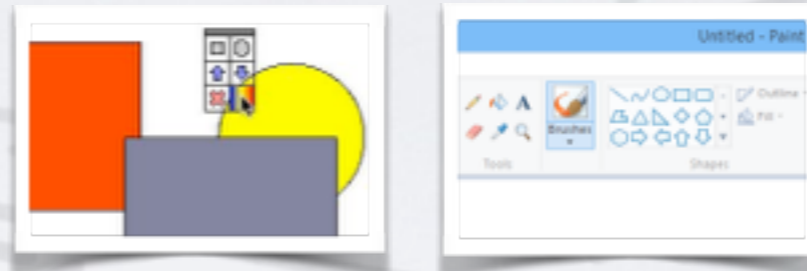




# Summary

Object- & Command-oriented metrics

Validation



Minimizing the required physical movement to switch tools does not necessarily lead to more object-oriented strategies

Techniques and tasks both influence strategies

Thank you  
for your attention

Alix Goguey<sup>1</sup>, Julie Wagner<sup>2</sup>, Géry Casiez<sup>3</sup>

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