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A Prototypical Photo Sorting Study Design for Comparing Interaction Styles

An initial and extensible study design for a generic image-sorting task which allows for comparing qualitative and quantitative properties of different interaction styles, input / output modalities, and UI implementations.

Goal: Tasks and Study Design for Evaluating Novel Interaction Styles

Problem: Evaluation of new interaction styles or input devices is difficult:

Subjective ratings ("I liked the new system better") offer only weak evidence of benefits.

Comparison to the state of the art is better but requires tasks that can be completed with old and new interface/device.

Ad-hoc-designed tasks may be tailored or biased towards new interface/device.

Our approach: Find tasks which can be completed with many different user interfaces and input devices.

Requirements: high internal and external validity, reproducible results, suitable for participants with diverse backgrounds, easy to setup and conduct.

First design: sorting a set of images into a few pre-defined categories.

In the study setup we propose, participants have to sort each of 27 images into one of five categories: city, vacation, food, pet, screenshot (from left to right).
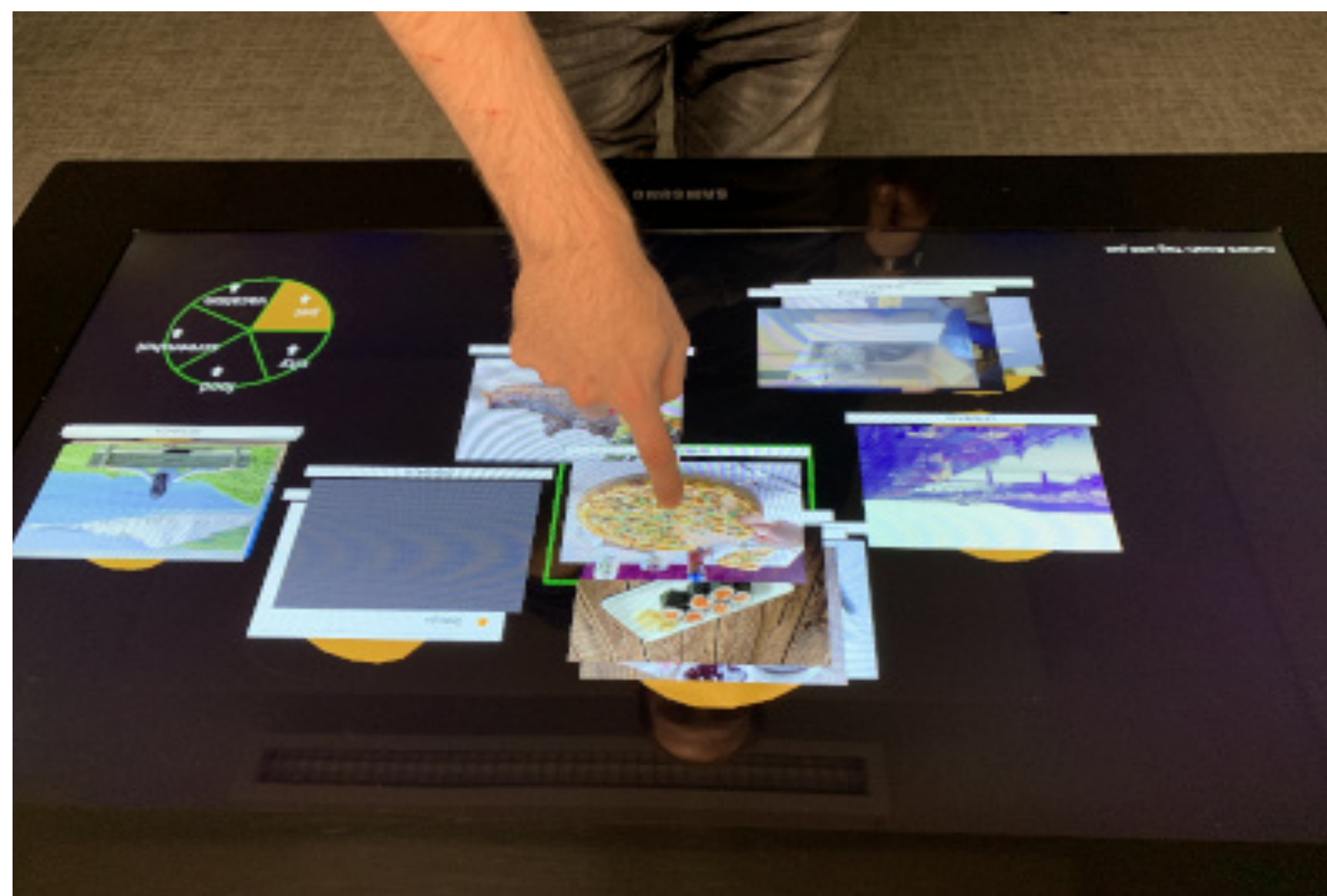
Study Design: Photo Sorting

Sorting icons on a desktop computer using a mouse

Sorting widgets on an interactive tabletop using fingertips

Sorting physical printouts on a table using both hands

Task

- image-sorting task
- required interactions represent many typical tasks in everyday life
- task variants show same abstract characteristics
- images are fast-to-process, cross-cultural, language independent
- suitable for many interaction styles

Study Design

- participants sort 27 images into five categories
- in each condition, participants use a different combination of interaction style, I/O device, etc.
- within-subjects with counter-balanced sequence
- each participant repeats the sequence once, in order to observe learning effects
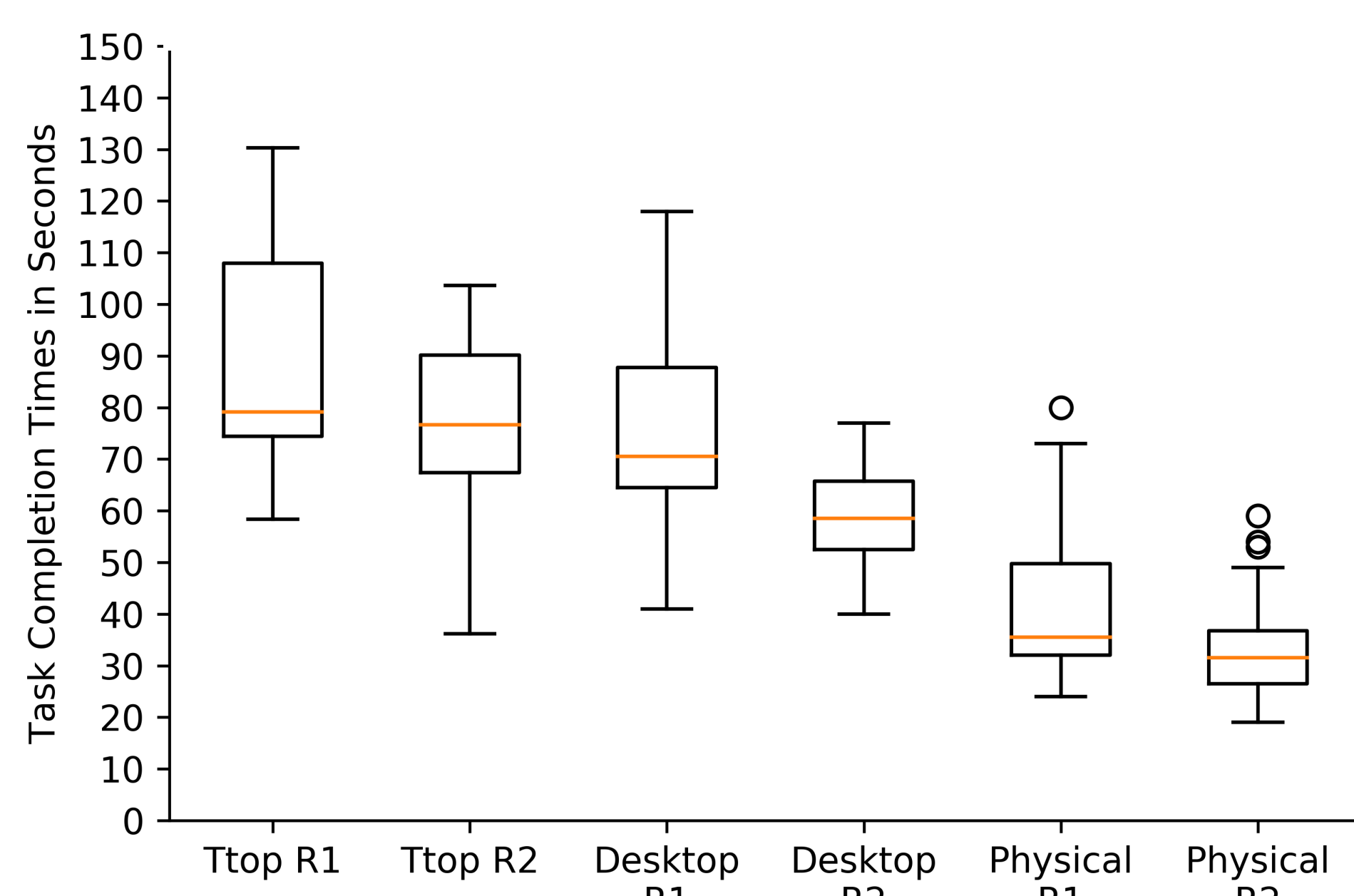
Limitations

- image-sorting task is purely visual
- unclear how it compares to non-visual tasks
- categories of the image set do not have the same amount of photos

- participant's optimum performance is not sufficiently approximated with only one repetition

First Results, Status, and Future Work

In our initial test run of our proposed study design, participants sorted the 27 images significantly faster using the physical interaction style. Each participant performed their test sequence twice (R1 and R2).

Status
We observed no inherent problems with the study design.
We did not replicate the study yet.
One repetition of the task is not enough for measuring the optimal performance for expert users

Future Work
We would like to support replication of the study by an different research group.
We are going to conduct interviews and focus groups in order to compile a corpus of tasks which intersects with various professional work domains.

Further Resources

Study design and required materials are available at
https://hci.ur.de/projects/ standardized_studies