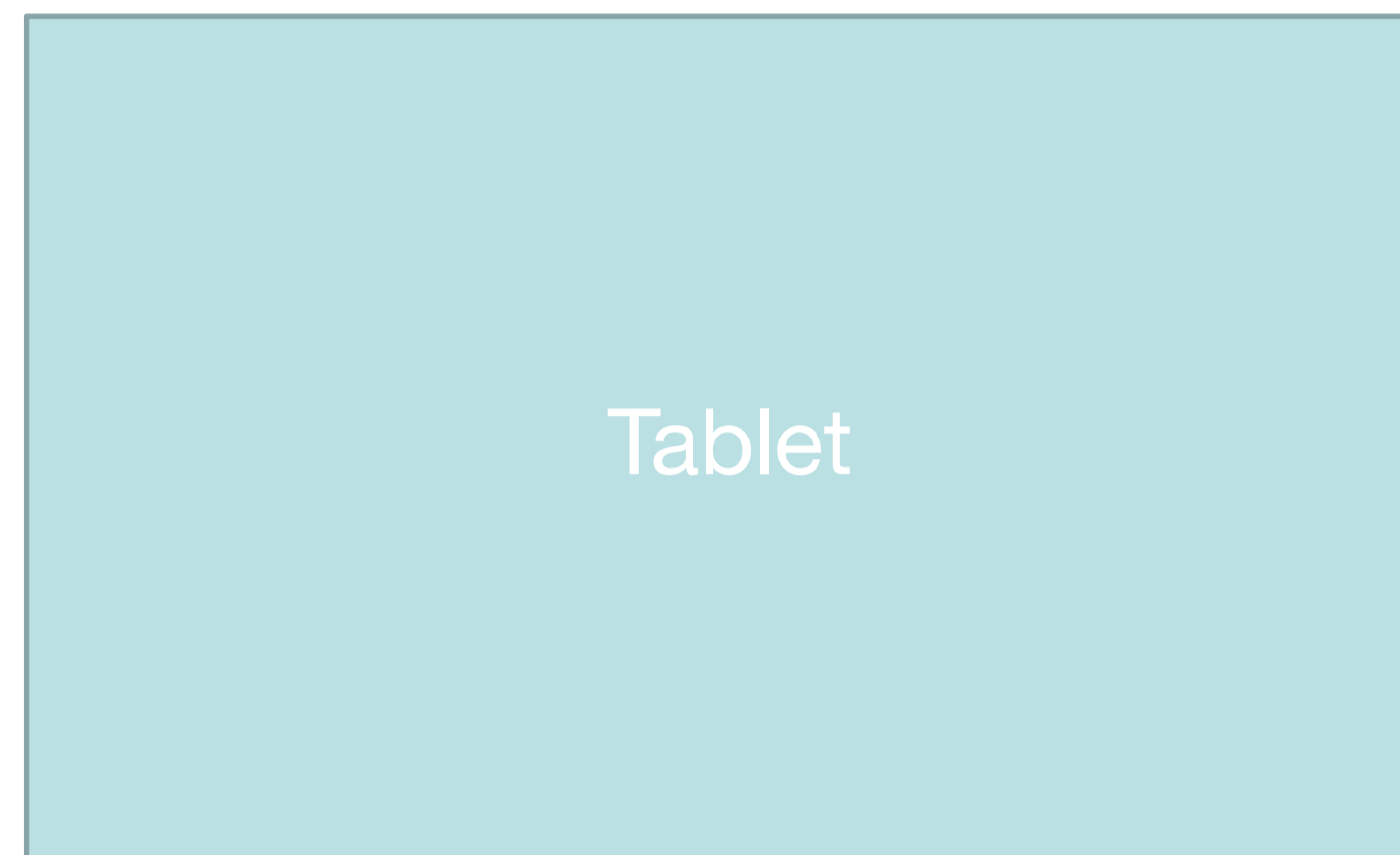
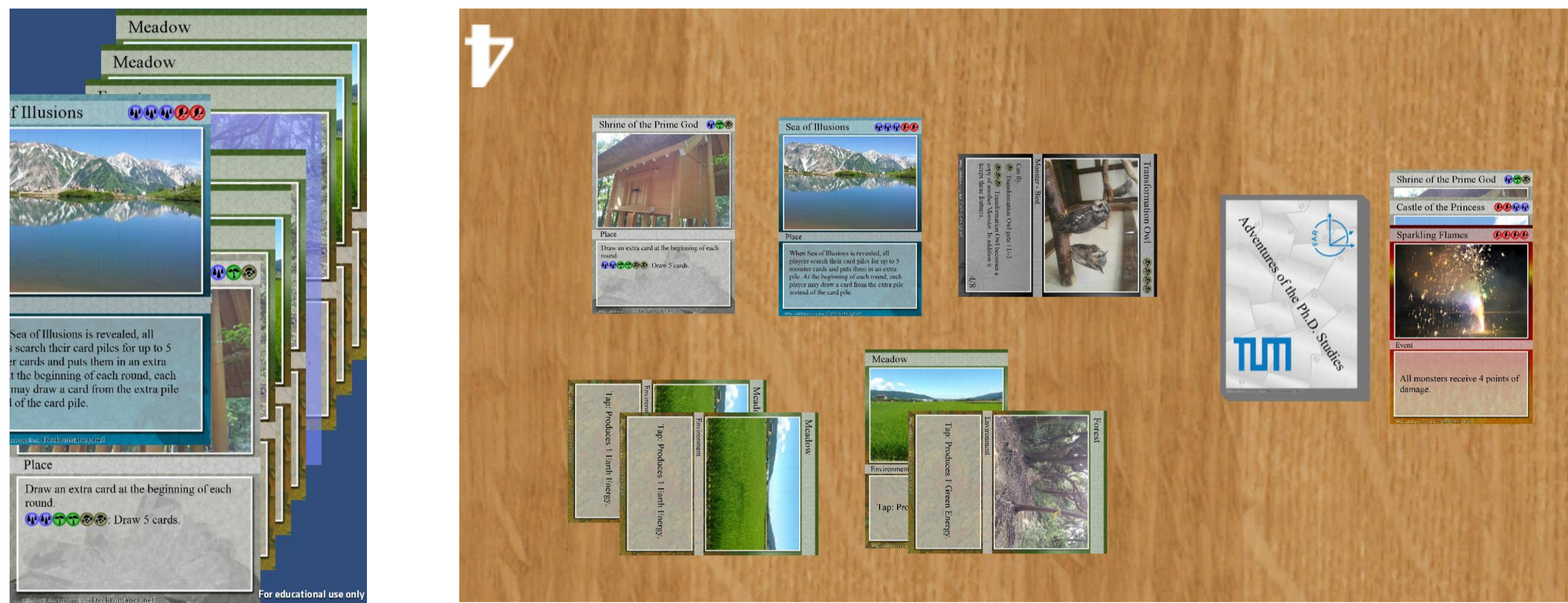


Natural Interaction for Card Games on Multiple Devices



Goals and Setup

- Create a system that conveys the natural feeling of card games
- Ensure User Awareness of Interactions
- 10" tablet as public display that resembles the playing area on a table
- Smartphone as private display that resembles the cards in a players hand

System Design

Design Principles:

- No game rules implemented (just a pile of cards is provided, similar to a real card game)
- Interactions mimic the interactions performed with real cards:
 - Drawback: Users need an explanation of the gestures in the beginning because the gestures are different from typical gestures used on mobile devices.
 - Advantage: Users immediately see the correspondence to the real gestures and therefore can easily remember and perform the gestures.
- No buttons, statistics, etc.: System should provide the same experience as real cards.

Virtual Hand Concept:

- Problem: Cards simply appearing at the other device when being transferred feels very unnatural. Such interactions are hard to follow for other players and onlookers.
- Solution: When a card is picked up, a *Virtual Hand* icon is shown and the card can be placed on one of the displays. This mimics the interaction with a real card being picked up and placed somewhere.

Iterative Process

Version 1:

- Simple initial system to get user feedback
- No multitouch gestures
- Direct transfer of cards between devices

Version 2:

- Virtual Hand concept: greatly improved User Experience and Awareness
- Selection rectangle to interact with several cards at once
- Sorting of hand cards similar to real cards

Version 3:

- Natural Gestures
- Touch through: Caused many problems and was removed after testing

Version 4:

- Hand Visualization for many cards
- Improved visual appearance

Outlook

- Use bigger screens or projectors as public display. Initial tests with a 18" display had a positive impact on the User Experience especially in games with four players.
- Interactions between real and virtual cards: How can virtual cards be placed on real cards on the table?

