

The background is a solid dark purple. It is decorated with various geometric shapes and patterns. On the left, there is a large circle with pink diagonal stripes, a smaller circle with blue polka dots, and a yellow zigzag line. In the center, a large dark blue circle contains the text. To its right is a light blue circle. Further right, there is a circle with blue diagonal stripes, a yellow circle, and a pink pentagon. At the bottom, there is a yellow triangle and a pink circle. Dashed lines in blue, yellow, and pink form various shapes like circles, triangles, and a square. A yellow triangle with vertical stripes is also present.

# Rapid prototyping of outdoor games for children in an iterative design process

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## The writers of the paper

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Note: There are actually only two researchers, one of  
these is likely an advisor.

# Primer



- A paper on the field of IDC (Interaction and Children)
  - A subset of HCI (Human Computer Interaction)
- Focused on the “design of games for children that support embodied interaction, especially those that can be played outdoors by many children together.”
- **Hypothesis:** For the innovative interactions within games, technology should be introduced as soon as possible in prototyping, to the point where paper prototyping at all can be a digression.

## Arguments for lo-fi



- ① Any more than low fidelity (most notably, paper prototyping) will take considerable time to develop.
  - Thus, developers will be more hesitant to make changes, even if testing shows that change is needed.
- ① Working prototype tests often get feedback on areas the testing is not meant for.
  - Rather than comments on design, they'll focus on details like fonts and colors.

## Primer (continued)



- The research is fundamentally split into two contributions:
  - A case study of the iterative design process of hi-fi prototypes with children
    - **Hi-fi:** *a working, interactive prototype*
  - The exploration of the design space of the technologies appropriate in designing outdoor games for children
    - Done through the use of the RaPIDO prototyping platform
- The general argument is that HCI/Game Design research + processes favor low fidelity prototypes when it may not be advantageous.

# RaPIDO



## RaPIDO

Individual devices with a variety of features:

- RFID readers for RFID tags
- Sound processor + speaker
- RGB LEDs
- XBee chip for radio communication
- (Later) accelerometer





1.

First Iteration



# The games played



## F.A.R.M.

“Finding Animals while Running and Mooing”

Made in a creative workshop that hadn't been implemented yet

Players have a set of animals they need to get

Players take turns as “farmer”, who possess an animal

In a turn, players have 10 seconds to catch the farmer to get the animal.

## Follow The Light

Inspired by games one author played as a child

Players start at start line

Every turn, a color + animal + number are announced

If they have the color on their clothes, they can take the number steps, steps being proportional to the animal's size.

## Save the Safe

Existing game from related literature

Robbers vs cops

Games are 3 minutes long

One cop has key

Cops have to guard robbers from key

Robber have to steal key and open safe



## First Iteration – Setup



- ⦿ This will be the case for all iterations, but the testing group are the children of Scouting Steensel in the Netherlands
- ⦿ Participants are 7 - 10 years old.
- ⦿ Fourteen children (3 girls, 11 boys)
- ⦿ Eight RaPIDO devices
- ⦿ Split into 2 groups and played F.A.R.M. and Save the Safe before swapping.
- ⦿ All played Follow the Light, sharing devices

## First Iteration – Results



- Children asked to talk about games and suggested changes through “collages”. But they pretty much just wanted to play around than discuss the games.
- Rankings:
  - 1) Save the Safe
  - 2) F.A.R.M.
  - 3) Follow the Light
- There was a high measure of agreement here.

“Follow the Light” didn’t work



- Some children even outright claimed it was boring.
- No agreement on the size of steps
- The color rule didn’t really matter with teams of 2-3.
- The game was slow and uninteresting



2.

Second Iteration



# Replacing “Follow the Light”



## Invade the Castle

A mix of scout leader ideas and the existing game Camelot

2-3 player teams

Three “weapons” spread and hidden around the area

Team have to track them down using a “hot cold” light on the RaPIDO and return them to base

First to get all three wins

## Second Iteration – Setup



- Ten children (2 girls, 8 boys)
- Snowed and freezing temperatures
- This is the case for all, but these were done in November/December, so it is always dark.
- Likewise, the location is the same, the scout's woods, for 2 hour sessions.
- Same as before, F.A.R.M. and Save the Safe first, then Invade the Castle.

## Second Iteration – Results



- Now asked for games to be ranked, followed up by interviews.
- Ranking:
  - 1) Invade the Castle
  - 2) Save the Safe
  - 3) F.A.R.M.
- There was high disagreement this time.
- Also, feedback wasn't that verbose.



3.

Third Iteration





## Third Iteration – Setup



- ① Fourteen children (2 girls, 12 boys)
- ① Three subgroups this time, but still F.A.R.M. and Save the Safe before Invade the Castle all together.
- ① However, the subgroups were grouped by age instead of random this time.

## Third Iteration – Results

- Only 10 of 14 stayed for interviews.
- Ranking:
  - 1) Invade the Castle
  - 2) Save the Safe
  - 3) F.A.R.M.
- There was medium agreement this time.

# Conclusions



- Testing with the same group has its merits
  - Children became comfortable, it was possible to read individual behaviors
- Radio technology was the most active from the RaPIDO
  - Allowed for game event communication and distance estimation, providing novelty
- “Games that need to be really experienced cannot be tested with lower fidelity prototypes”
- Such games need to be tested “in the wild”



# Rant

I don't like this paper

# 1. How do you paper prototype recess?



- The basis of this paper is that technology-rich prototyping is valuable.
- But this isn't prototyping with technology - this is making prototypes for games based on technology.
  - RaPIDO is present in all of them.
- Furthermore, while paper prototype is very common in general game design, there weren't any examples of them being practiced in the field of IDC.

## 2. The games suck



- ⦿ All these games seemed rather boring and had holes
  - F.A.R.M.'s athleticism favor
  - Follow the Light's cheating potential
  - Save the Safe's intrusive used of RaPIDO
  - Invade the Castle is actually pretty cool
- ⦿ The issues are only really noticed AFTER testing, when they seem pretty obvious in hindsight.

### 3. Unstructured procedure for a study

- ① The change of the games is interesting, but there were so many confounding variables.
  - Games changed between iterations
  - The groups playing involved both new and old members
  - The number of players varied per iteration
  - Playing conditions varied
  - Even the review method changed (though this was probably for the better)

## 4. RaPIDO



- The study utilizes the RaPIDO without much reason - literally all children's games except the ones made here were developed and played without RaPIDO.
- RaPIDO is made by Iris Soute (with other colleagues of course) and so it's use is seemingly biased.
- It only really caused issues with the games (the exception being Invade the Castle).



## 5. It's not rapid



- Not much of this work can be extrapolated out to more general game design practices.
  - Outdoors children games have most of the prep in rules development and polish.
  - So there isn't much discernable difference between lo-fi and hi-fi prototypes.
  - Much less board games and video games, not even sports can't be prototyped in fashion - there are just far more considerations.

# Takeaways



# Prototyping considerations



- When to use paper prototyping vs higher fidelity prototyping
- The potential of children in prototype testing
- Accessing the community for game design
  - Scouts, schools, etc.
- Practicing game design beyond our comfort zone of “video games”
- Use of the same testing on multiple occasions

The slide features a dark purple background with various geometric shapes in the corners. Top-left: a pink circle, a dashed yellow circle, a solid purple pentagon, a blue dotted circle, and a pink outline pentagon. Top-right: a light blue triangle, a dashed yellow circle, a solid purple circle, a pink and white striped circle, and a light blue outline pentagon. Bottom-left: a light blue outline pentagon, a pink triangle, a yellow and black striped triangle, a solid purple triangle, and a dashed yellow circle. Bottom-right: a pink ring, a dashed yellow triangle, a blue dotted circle, and a solid purple pentagon.

Any questions?