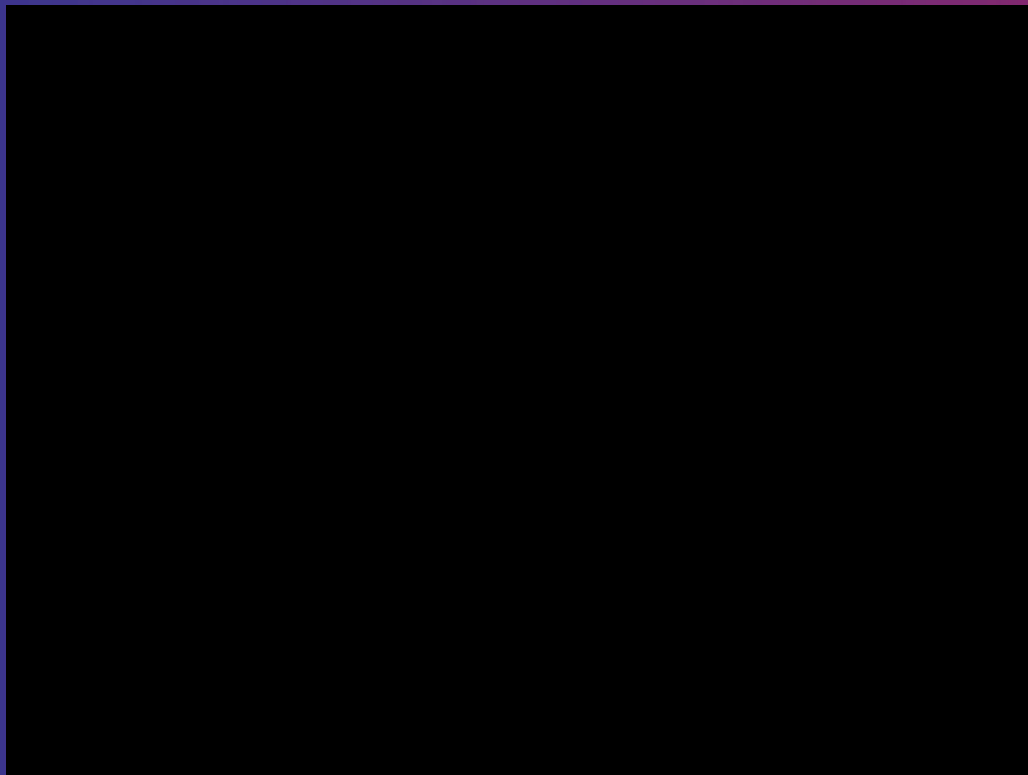




# TRAILER





Towards the source

**Target groups:** Adults (18-50)

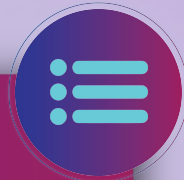
**Genre:** Casual Game

**Platform:** Android

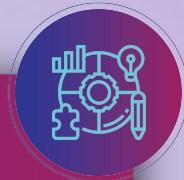
**Setting:** A stream of fluid

## OVERVIEW

In “Fount”, the gamer will play as a nanobot in a fluid stream to support the environment and induce positive emotions. The player can explore and interact with the elements in the stream and support them to finish tasks. Adaptive sound and visualization will help to induce positivity, while generating the flow state through gameplay.

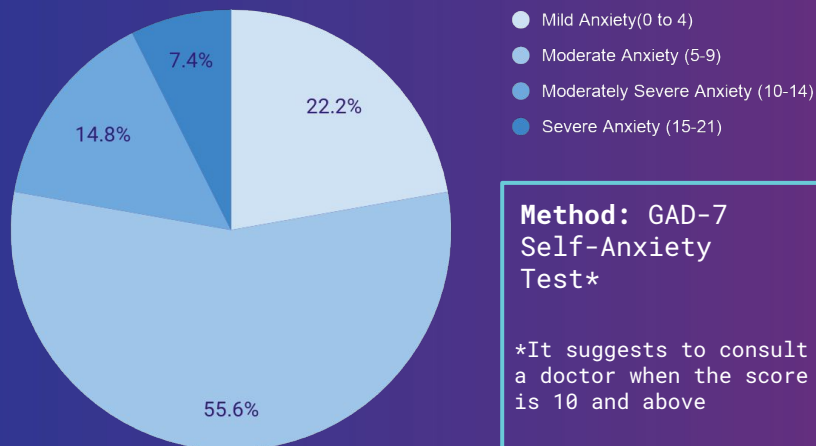


# CONCEPTUALIZATION



## PRELIMINARY SURVEY

Anxiety in People



**Method:** GAD-7  
Self-Anxiety  
Test\*

\*It suggests to consult  
a doctor when the score  
is 10 and above

### Overview of Survey

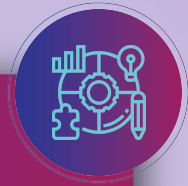
**Survey Type:** Online

**Number of Participant:** 26

**Age Group:** 18-25(33.3%),  
25-40(66.7%)

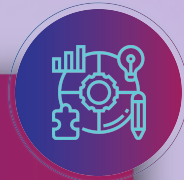
**Tool:** Google Forms & Sheets

**Participants:** Friends &  
Family members, People  
living in different  
countries.



## THEORETICAL APPROACH

1. Playing Casual Video Games(CVGs) improves mood and decrease stress.<sup>1</sup>
2. Prescribing CVGs can supplement the existing medicine or treatment to depression and anxiety.<sup>2</sup>
3. There are numerous benefit to flow and play in learning outcomes.<sup>3</sup>
4. Flow state is beneficial to reduce stress, specially when waiting.<sup>4</sup>



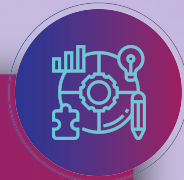
## COMPARABLE GAMES

### Serious Games about Depression & Anxiety



### Casual & Relaxing Games





## MARKET ANALYSIS

### Mindfulness App

52 million downloaded [[source](#)]

Generated a revenue of \$195 million in 2019. [[source](#)]

Meditation apps ranked higher than before. [[source](#)]



### Mobile Games

Increase in time spent 20% in Q1 2020. [[source](#)]

Consumers spent 5% more on games in Q1 2020 than in Q4 2019. [[source](#)]

Casual games see increase during pandemic [[source](#)]





## IDEATION (APPROACH TO IMPACT)

### Solution Approach

1. Overwhelmed by thoughts
2. Increasing stress and anxiety
3. Aggressive behavior
4. Lack of information on relaxation technique

**Generating  
flow State**

Coping  
mechanism

+

Stealth  
approach to  
convey  
information

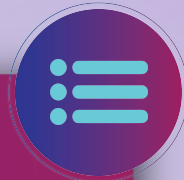
Supporting  
"Mindfulness"  
Technique

1. Casual Game
2. Easily available
3. Minimalistic Visual
4. More ludic

**Problem Definition**

**Conceptualization**

RHT



# DESIGN



## FLOW STATE

Definition:

“....a flow state, also known colloquially as being in the zone, is the mental state in which a person performing an activity is fully immersed in a feeling of energized focus, full involvement, and enjoyment in the process of the activity.

”

*Wikipedia* <sup>5</sup>

---



## COMPONENTS OF FLOW STATE <sup>6</sup>

1. Clear goals
2. The sense of control
3. The merging of action and awareness
4. A challenge activity that requires skills
5. Direct feedback
6. Concentration on the task at hand
7. The loss of self-consciousness
8. The transformation of time



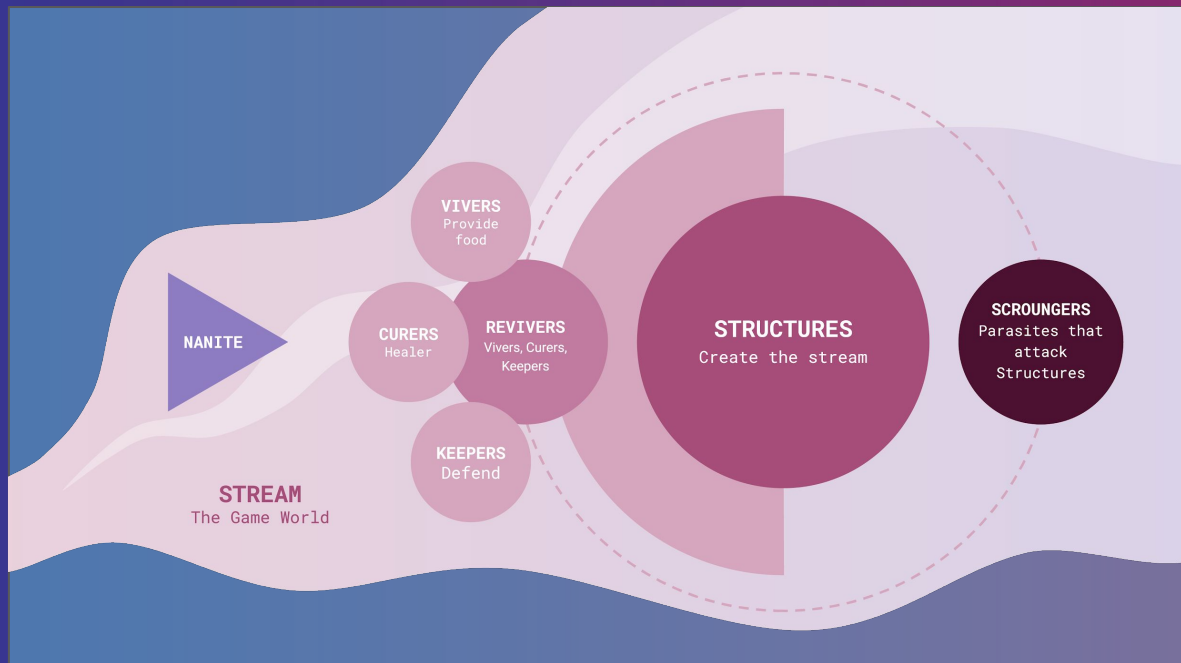
## COMPONENTS OF FLOW STATE <sup>6</sup>

1. Clear goals
2. The sense of control
3. The merging of action and awareness
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5. Direct feedback
6. Concentration on the task at hand
7. The loss of self-consciousness
8. The transformation of time



# CLEAR GOALS

## Narrative



RHT



# CLEAR GOALS

Task & Location Based Signal



RHT, JJ



# SENSE OF CONTROL

## Simple Mechanics



### Movement

Rotate the device to move in different directions.



### Vacuum

Move towards a scrounger. Nanite will vacuum it automatically.



### Guide

Entering an area of Keepers, Curers, or Vivers and "Tap" on the screen will make a signal and they will start to follow. Another "Tap" will release them.



### Breath

When getting overwhelmed by Scroungers, Breathing will eliminate some of them. "Tap & Hold" on the screen to use it. It can be only used when activated.

RHT, JJ, KA





# SENSE OF CONTROL

Easy Control



Accelerometer



Tap & Hold



Tap



Calibration

RHT, JJ



# SKILL VS CHALLENGE

## Dynamic Difficulty Adjustment (DDA)

### System Based

1. Based on Players Time to Kill ratio.
2. Time based, not level based
3. Level design:
  - a. Distance among the elements are always the same
  - b. The speed of elements and numbers are same

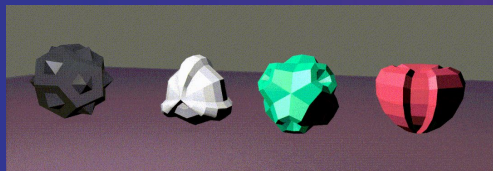
### Player Based

1. "Breathing" mechanics allows player to eliminate enemies easily.
2. It only activates based on Players Time to kill ratio.
3. Doesn't depends on level
4. Combined with system based DDA.



# DIRECT FEEDBACK

## Aesthetics



NPCs

- Abstract
- Designed to Support Flow State
- Simple, Readable yet Expressive and Playful.



Structure

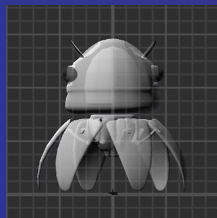


# DIRECT FEEDBACK

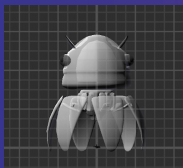
## Animations

- Part of the visual feedback with the mechanics
- Add a bit of characteristics for the player's actions.

Samples:



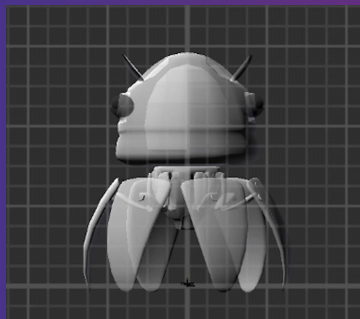
Guide Signal



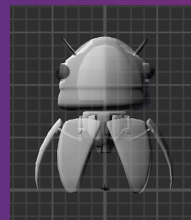
No Response



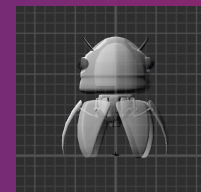
Release



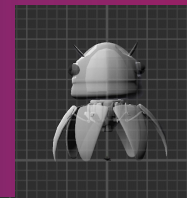
Breathing



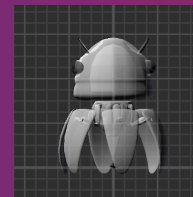
Vacuuming



End Structure



End Region



End Demo

JJ, KA



# DIRECT FEEDBACK

## Visual Effects

More visual feedback with Unity's particle system and animation.



Vacuuuming VFX and Animation



Fully Nourished Structure VFX

JJ, KA



## DIRECT FEEDBACK

### Audio

**432**  
hz

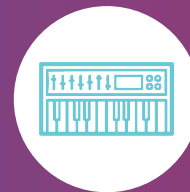
**Healing/  
Meditation  
Frequency**

**90**  
bpm

**Human  
Heartbeat  
Pulse**

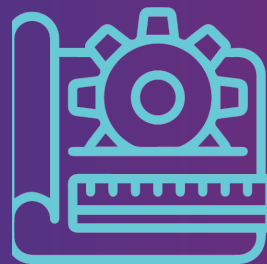
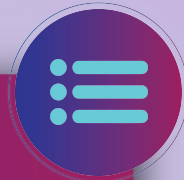


**Smooth  
Ambient**

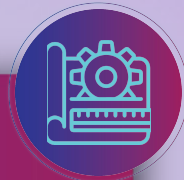


**Piano  
&  
Synthesizer**

RHT, JJ, KA, TC

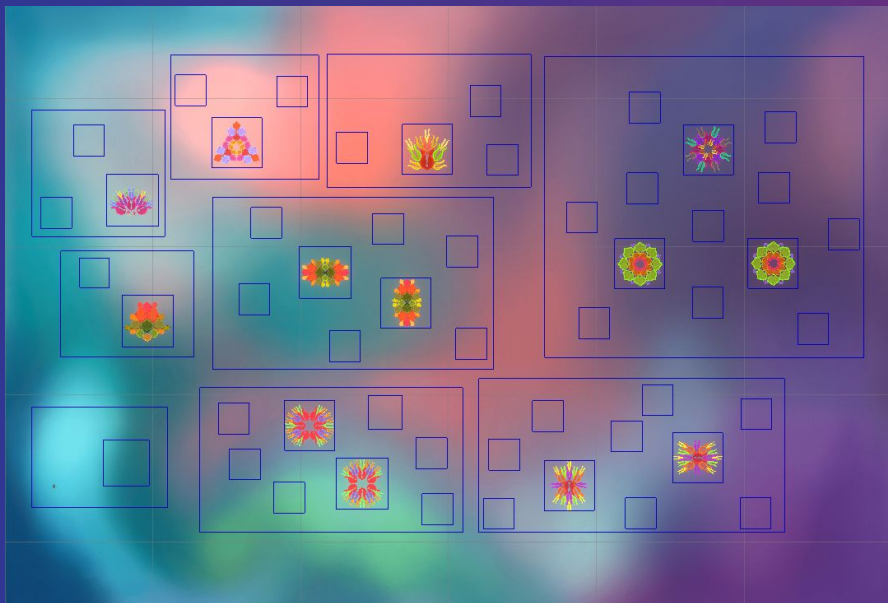


# BUILDING PROTOTYPE



# CHALLENGES

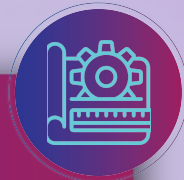
## Flocking system



Level Map

- Creating Flocking System in One Area is Simple
- Gets way complex when flocks move from one area to another
- Even complex moving from area to region.
- Maintaining the position is challenging as flocks hop to areas
- World
  - Region
    - Area
- Implementing multiple flock behaviors





# CHALLENGES

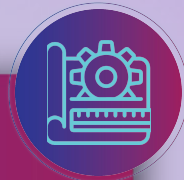
## Flocking system

### Basic Behaviors

- Separation
- Alignment
- Cohesion

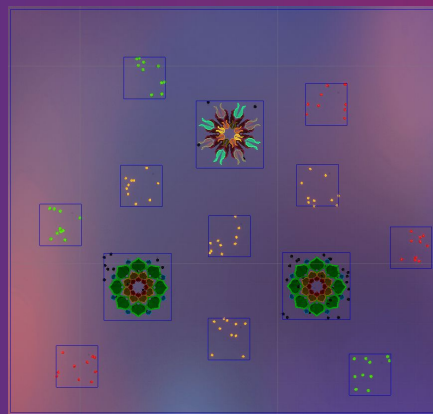
### Extended Behaviors

- Containment
- Seek
- Pursuit
- Arrive
- Avoidance
- Wander
- Follow Target



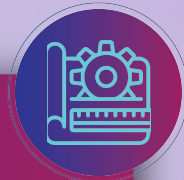
# CHALLENGES

## Optimization



### Region 9

Region with most number of spawns



# CHALLENGES

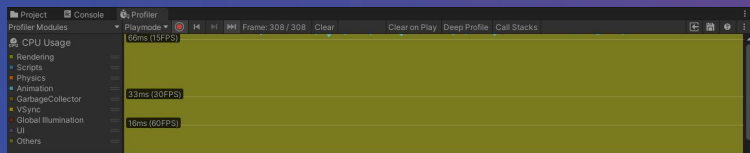
## Optimization

Before

Scripts

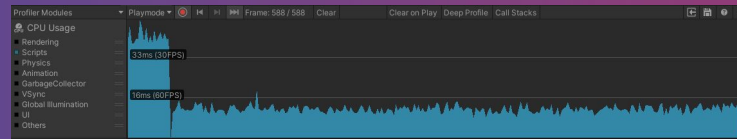


Others



After

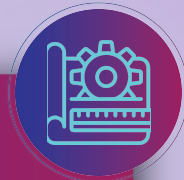
Scripts



Others



JJ, KA



# CHALLENGES

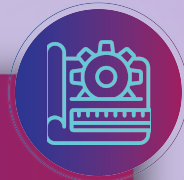
## Vertex Counts

- Aim for no more than 100k vertices on mobile.
- So far: max ~21k vertices



Statistics	
<b>Audio:</b>	
Level: -74.8 dB	DSP load: 0.3%
Clipping: 0.0%	Stream load: 0.0%
<b>Graphics:</b>	
332.9 FPS (3.0ms)	
CPU: main 3.0ms render thread 1.3ms	
Batches: 65	Saved by batching: 150
Tris: 19.1k	Verts: 21.7k
Screen: 1774x998 - 20.3 MB	
SetPass calls: 41	Shadow casters: 0
Visible skinned meshes: 27	Animations: 0

JJ, KA



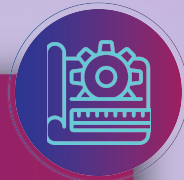
# CHALLENGES

## Vertex Counts

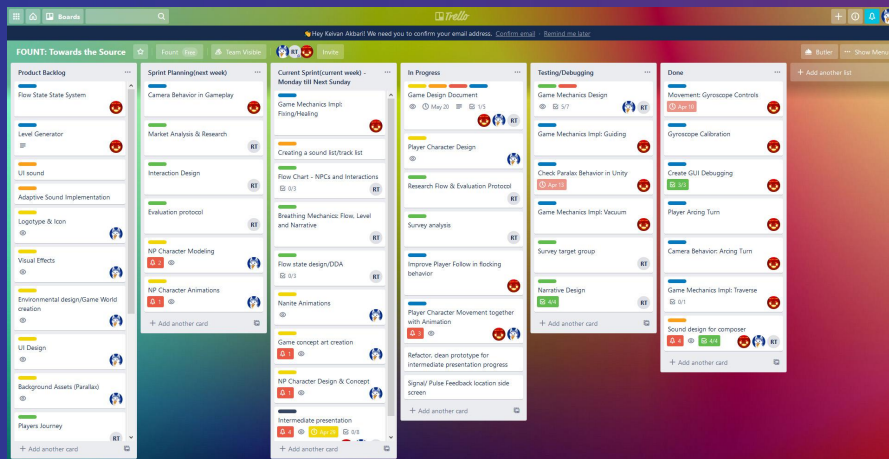
- Created modular base models to construct the structure
- Utilized Dynamic Mesh Batching



RHT, JJ, KA



# PROJECT MANAGEMENT

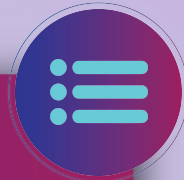


Regular Discord Voice Call Meeting

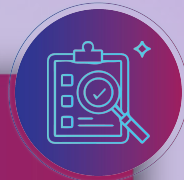
Weekly Sprint Planning with Trello



RHT, JJ, KA



# EVALUATION PROTOCOL



# EVALUATION PROTOCOL <sup>7</sup>

## Participants

50

Participants

2

Test Groups



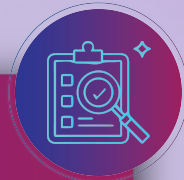
Online  
Recruitment

GAD-7

Recruitment  
Method

RHT





# EVALUATION PROTOCOL <sup>7</sup>

## Instruments

2

### Games



*Font*

Towards the source

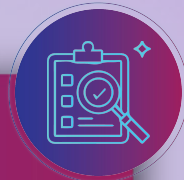
### Questionnaire

**HADS Scale**

### Analysis Tool

**G\*Power**

RHT



# EVALUATION PROTOCOL <sup>7</sup>

## Procedures

### Recruitment

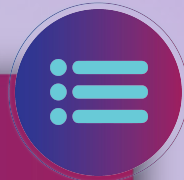
- Recruit online with Questionnaire
- Acceptance: with moderate to high anxiety
- Randomly assign to 2 groups
- Provide 2 games to 2 group

### Sessions

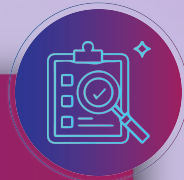
- Prescribe to play assigned game for the group
- 3 session each week
- 15-30 minutes each session
- Over 1 month
- Self-report: HADS, weekly

### Analyze

- Compare weekly and overall impact
- Compare the impact of two games
- Compare the impact on anxiety and depression



# SUMMARY



## UNIQUE FEATURES

1

**Casual and  
simple to play**

2

**Ludic approach  
to get more  
outcome**

3

**A combination  
of Player &  
System Based  
DDA**

4

**Stealth  
approach to  
convey the  
information**

RHT, JJ, KA



## REFERENCES

1. Russoniello, Carmen & O'Brien, Kevin & Parks, J.M.. (2009). The effectiveness of casual video games in improving mood and decreasing stress. Journal of Cyber Therapy and Rehabilitation. 2. 53-66.
2. Russell Pine, Theresa Fleming, Simon McCallum, and Kylie Sutcliffe(2020).The Effects of Casual Videogames on Anxiety, Depression, Stress, and Low Mood: A Systematic Review. Games for Health Journal, Vol 9 – Number 4. DOI: 10.1089/q4h.2019.0132.
3. Pavlas, Davin. "A Model Of Flow And Play In Game-based Learning The Impact Of Game Characteristics, Player Traits, And Player States." (2010).
4. Rankin, K., Walsh, L. C., & Sweeny, K. (2019). A better distraction: Exploring the benefits of flow during uncertain waiting periods. Emotion, 19(5), 818-828. <https://doi.org/10.1037/emo0000479>
5. Flow(Psychology), Wikipedia.
6. Jenova Chen, M. F. A. (2006). Flow in Games
7. Fish, Matthew & Russoniello, Carmen & O'Brien, Kevin. (2014). The Efficacy of Prescribed Casual Videogame Play in Reducing Symptoms of Anxiety: A Randomized Controlled Study. Games for Health Journal. 3. 291-295. 10.1089/q4h.2013.0092.



## TEAM



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*<https://soundcloud.com/tapesh-chakraborty>*

This game is made as a 6th Semester Bachelor project on "Impact Games" in Cologne Game Lab, TH Köln, Cologne

### CGL

Cologne Game Lab

Institute for  
Game Development  
& Research

Technology  
Arts Sciences  
TH Köln



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*Katholische Hochschule NRW*

*[www.disup.de](http://www.disup.de)*



**THANK YOU!**