### Proposals for Project 2

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<td>Maxime</td>
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<td>Lennart</td>
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<td>Huiting</td>
<td>Stefan</td>
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**Emilie**

**Viktor**

**Viktor**

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**Lennart**

**Mikael**

**Huiting**

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**Johan**

**Omád**

**Johan**

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**Wheelchair**

**Canon**

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**Victor**

**Anton**

**Max**

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**Bloodcells with Friends**

**Douglas**

**Niklas**

**Rasmus**

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**Submarine in a Fishtank**

**Erik**

**Simon**

**Mårten**

---

**Spinnulator**

**Adrian**

**Robin**

**Vincent**

---

**Spraylt**

**Prasanth**

**Maxime**

**Robert**

---

**Aerial**

**Anton**

**Erik**

**Johan**

**Daniel**

---

**Mario Romero 2015/11/10**

---

**KTH**

**VISUALISATION INTERACTION COLLABORATION**

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**VICSTHLM**
AGI15 Calendar: [link]

- Mon 31 aug 15:00-17:00
  Lecture 1 – Introduction
- Tue 1 sep 13:00-17:00
  Lecture 2-3: Forming Groups and Brainstorming
- Mon 7 sep 15:00-17:00
  Lecture 4: Proposals
- Thu 10 sep 10:00-12:00
  Lecture 5: Discussion based on Proposals
- Mon 14 sep 15:00-17:00
  Lecture 6: Hello World Demos
- Thu 17 sep 10:00-12:00
  Lecture 7: Discussion based on the Hello World Demos
- Tue 22 sep 10:00-12:00
  Lecture 8: Preparing ForskarFredag 2015
- Fri 25 sep 8:00-16:00
  ForskarFredag
- Mon 28 sep 15:00-17:00
  Lecture 9: Reflecting on ForskarFredag
- Mon 5 oct 15:00-17:00
  Lecture 10: Agile Development 1 towards Comic Con - Gamex 2015
- Mon 12 oct 15:00-17:00
  Lecture 11: Agile Development 2 towards Comic Con - Gamex 2015
- Fri 30 oct 9:00 – Sun 1 Nov 17:00
  Comic Con Gamex
- Mon 2 nov 15:00-17:00
  Lecture 12: Reflecting on Comic Con Gamex
- Tue 3 nov 13:00-17:00
  Lecture 13-14: Forming new groups and brainstorming project 2
- Tue 10 nov 10:00-12:00
  Lecture 15: Proposals Project 2
- Tue 17 nov 10:00-12:00
  Lecture 16: Hello World Demos for Project 2
- Tue 24 nov 10:00-12:00
  Lecture 17: Agile Development 1 for Open House
- Tue 1 dec 10:00-12:00
  Lecture 18: Agile Development 2 for Open House
- Fri 4 dec 15:00-19:00
  VIC AGI15 Open House
Proposal for ColorSplat

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Advanced Graphics and Interaction
AGI15
2015/11/10
Motivation

• Help people stay fit and do sports while playing.
• Help rehabilitation of people with movement difficulty.
• Practice creating graphical elements
Goals and Challenges

• Goals
  – Create a game that forces the user to move
  – Create a game that works for people who have difficulty to move
  – Make awesome graphics

• Challenges
  – To combine the first two goals.
  – To make awesome graphics
  – Use 4K screen and Kinect!
Related Work

• Splatoon - Nintendo Wii U game
  Realistic 3D splatting paint
  http://splatoon.nintendo.com

• Battle Paint
  2D shooting game
  http://armorgames.com/play/10828/battlepaint

• Reflexion Health
  Rehabilitation software using Kinect
  http://reflexionhealth.com

• Inspirational articles about viscous liquids
  https://cs.uwaterloo.ca/~c2batty/
Battle Paint
Thank you!

Questions?
Emilie Le Moël  emilielm@kth.se
Viktor Alderin  valderin@kth.se
Viktor Leandersson  vlea@kth.se

Teacher: Mario  marior@kth.se
Colorsplat feedback

4K stereoscopic screen game
3 people? How many in general?
Use movement - force movement to be no-steps, one-step, two-steps. Define area of interaction on the floor. You need to mark the ground - let people know where they need to move
How do you lock-on a target?
Settings for sensitivity
create graphical elements
focus: liquids and color effects
Where will the kinect live? You can use the kinect over the screen, but don’t let the users exit the field of view/interaction.
awesome graphics - be more precise
related work - splatoon, battle paint,
liquids
paint is a viscous liquid -
Experience with kinect - viktor
Kinect 2
How do you use the Kinect
one hand aims another hand throws
Will you use Unity? WebGL? What?

References:
https://www.youtube.com/watch?v=7k8DRJW4LDY
https://www.youtube.com/watch?v=fbZ64bixEw
http://pub.ist.ac.at/group_wojtan/projects/surface_tension/surface_tension.html
http://pub.ist.ac.at/group_wojtan/projects/thin_fluid_features/thin_fluid_features.html
https://www.youtube.com/watch?v=ROnk1Jd6ueA
https://www.youtube.com/watch?v=Sn5nSFg2e5Y
https://www.youtube.com/watch?v=NkV2T_jew
Other Room
Lennart, Mikael & Huiting
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A window to another room

- Projection on a wall to create illusion of space

- Nature like realistic animations

- Sound to interact with the environment
  - Blow to create wind
  - Whistle to make trees grow
  - Snap fingers to create campfire
  - Clap to make flower petals drift and fall on the water surface
  - ...

Motivation

Creating a peaceful scene, free from disturbance

Simple interaction to allow for a lot of experimenting with graphic elements

A way to make your small room look bigger
Goals

Create the illusion that there is a space behind the projection

Learn WebGL and one individual advanced graphic element

Challenge and Risk

How much should we push for realism in the scene?

The product may give a poor result due to individual implementation of features failing
Related work

So many great examples of audio visualization out there!

> Speakasso
> Bird Sounds Visualised
> A dive in music
Methods and Technique

WebGL together with Three.js

Web Audio API

Projection

Work plan: Create a simple base together, then branch out into independent individual features
Proposed Related Papers

Procedural generation of plant life:

(OBS! old)


Real-time realistic volumetric fire:

Christopher Horvath and Willi Geiger "Directable, high-resolution simulation of fire on GPU." SIGGRAPH ‘09 papers. ACM, 2009.


Animated natural water surface:


Thank you for listening!

Questions?
Feedback to Other Room

projection of wall for illusion of other space
4k stereo
interaction through sound
blow - wind; whistle to make tree grow; clap; snap
voice - use Speakasso DSP??
quality of life - concentrate more on meditation
empty our mind from daily activities
illusion - other space behind projects
will you like to use first person perspective? NO
realism? NO
non-photorealistic rendering
related work
Speakasso
Bird Sounds
dive in musics
music interaction project
abstract representations
Difficult:
there is no right or wrong - challenge!!!
there is no target - challenge!!!
WebGL and Three.js
will you use 4K?
procedural generation of plant life
real-time realistic volumetric fire
real-time realistic volumetric water
c-awards flame project http://www.cawards.se/project/kill-it-with-fire/
depth - 3D stereoscopic rendering? Perhaps
sense of perspective ?
not flat picture on wall?
a room on the other side?
look wiggle 3D - illusion of 3D
track users’ head?
really artistic - behave realistically?
interactive painting - artistic - aesthetic
non-photorealistic - cartoon style
YA3 -

References:
Artistic rendering: http://core.ac.uk/download/pdf/8767749.pdf

Examples in games:
https://www.youtube.com/watch?v=q7gDJ4hQ1wWc
https://www.youtube.com/watch?v=QyoqWApzI68
https://www.youtube.com/watch?v=QyZ0tyq-zLM
https://www.youtube.com/watch?v=ECHnqMkIu1A
https://www.youtube.com/watch?v=kekXswh31VYo
https://www.youtube.com/watch?v=CYOlW-ae5sk
Wheelchair Game

- Proposal -
Advanced Graphics and Interaction 2015
Motivation

• Turn an important exercise within wheelchair training into a fun game.

• Learn more core graphics (WebGL) compared to using Unity.

• Easy interaction tech (phone) so we can focus on the graphics.
Goals and Challenges

• Goals
  – Single player game with smartphone attached to a wheelchair as controller
  – Cool graphics with WebGL
  – Transmit the rotation of the phone to the browser
  – Create a fun and new gaming experience

• Challenges
  – Make the control feel responsive.
  – Latency in the communication between the phone and the browser.
  – Struggling with WebGL and state of the art graphics theory.
Related Work

- "KINECT wheels: wheelchair-accessible motion-based game interaction"

- “Creating wheelchair-controlled video games: Challenges and opportunities when involving young people with mobility impairments and game design experts”
  - Kathrin M. Gerling, Conor Linehan, Ben Kirman, Michael R. Kalyn, Adam B. Evans, Kieran C. Hicks, 2015

- The Wheelchair Driving Simulator
  - playfulshark.com/wheelchair-driving-simulator/ (2009)

- SpaceLamb
KINECT Wheels

It builds on the support for seated play that has been added to the Kinect SDK.
The Wheelchair Driving Simulator
SpaceLamb

https://www.chromeexperiments.com/experiment/spacelamb
Methods and Techniques

- Output Device: Common computer screen
- Input Devices: Smartphone App + Wheelchair, maybe an additional finger button(?)
- Sounds: Success / Fail / Hit / Background music
- 3D Assets: Created by our own, will depend on gameplay
- Tools: Github for Code Hosting / Freedcamp for Project Management
- The whole setup could be published as public github repo for people who want to build successors
- Interaction Paradigm: Wheelchair
Thank you!

Questions?

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Omid Ghorreshi {omidgh@kth.se}

Johan Kitti Söderberg {johanks@kth.se}

Stefan Seibert {sseibert@kth.se}

http://www.thereisnowebpageyet.com/
Discussion about the gameplay

• We are not sure of what type of gameplay we want.

• What we do know is that we want to use the pitch and yaw from the smartphone as controller.

• Three ideas:

  1. Shooting game (cannon, bow or whatever) and you control the aim.

  2. Driving game with a fixed speed and you control the turning and jumping.

  3. A fly simulator with a fixed speed and you control the pitch and yaw.

• What do you think?
Feedback to Wheelchair Canon

real wheelchair!!!
webGL
phone rotation
web sockets
Kinect wheels - use kinect rotation - steering and depth - speed
mobility and game design
wheelchair driving
spacelamb
what is the objective of the game?
discussion - how the game could look?
Flying?
Pitch?
platform
level 0 - just left and right, forward and backward
platform - level 1
“Wheely” pitch - level 2

target audience - people with recent injury (permanent or long term)
want to be useful - what is useful to practice?
balance
pitch -
You have to think about the graphics elements.
Think about fog, clouds, fire, light dispersion, path creation, virtual camera control. Try not to focus on game play.

Some inspiration:
http://elib.uni-stuttgart.de/opus/volltexte/2012/7960/pdf/BCLR_0006.pdf
http://publications.lib.chalmers.se/records/fulltext/155126.pdf
https://www.chromeexperiments.com/webgl,motion-control?page=0
https://www.chromeexperiments.com/webgl?sort=popular
Proposal for Project 2

Cool Photo of Student 1
vhung@kth.se
141

Cool Photo of Student 2
aeldh@kth.se
175

Cool Photo of Student 3
maxtu@kth.se
142

Advanced Graphics and Interaction
AGI15
2015-11-09
Hellthy Kitchen
Motivation

• Promote healthy living through cooking
• People who can't cook, can now learn with Gordon Ramsey!
• First ever realistic cooking simulator in VR
Goals and Challenges

• Goals
  – Promote healthy living
  – Easy recipes
  – Having fun while cooking (adding humorous elements)

• Challenges
  – Create a realistic kitchen environment
  – Mesh cutting (Cutting tomatoes for example)
  – Get the rotation from the android phones.
Related Work

• Surgeon Simulator 2013
• I am Bread
• CyberCook Taster
I am Bread
CyberCook Taster
Methods and Techniques

- Photorealistic rendering
- Different lightning models
- Bumpmapping
- 3D modeling (Making realistic models)
- Kinect, oculus rift and mobile phones.
- Socket IO - for sending handrotation from phones
Thank you!

Questions?

Anton Eldh {aeldh@kth.se}
Max Turpeinen {maxtu@kth.se}
Victor Hung {vhung@kth.se}
Feedback to Hellthy Kitchen

virtual reality cooking game
healthy living through cooking
learn healthy recipes
realistic real time rendering
easy recipes
fun while cooking
cutting - mesh cutting
two android phones
surgeon simulator 2013
I am bread
realism and interactive methods
photorealism
lighting models
bumpmapping food
3d modeling

kinect oculus rift
mobile phone - hands - rotation and grab
wii motes
sensor
sonification - kitchen demo
soundscape
focus on the graphics -
simplify the healthy cooking, modeling, interacting
reverse engineer one recipe that has four or five interesting ingredients
focus on special effects: fire, water, smoke, burning oil, viscous liquids (oil, eggs), powdered substances (flour)
leap motion - no!

References:
Project 2

Douglas Carlsson
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Niclas Ericsson
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Rasmus Ansin
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Advanced Graphics and Interaction
AGI15
2015-11-09
Blood Cells with Friends
Concept

A piece of medicine has to be delivered to the right part of the body. One player controls a piece of medicine inside of a person with a controller, trying to fight towards the end goal, curing the patient.

All the action is shown on a PixelSense 2 tablet screen, where one to three other players interacts with the game field, trying to help the medicine reach its goal.
Motivation

• Learn about the human body in a fun way
• Interesting collaborative mechanics
• Unique social interaction
• Operate with your friends
Goals and Challenges

Goals
• Provides a fun learning experience
• Learn about the human immune system through tool tips
• Emphasizes cooperation and communication

Challenges
• Getting the PixelSense SDK to work well with Unity
Related Work

- Infection
  - PC, 2014

- Trauma Center
  - Atlus, 2005

- Gauntlet II
  - Atari, 1986
Infection
Trauma Center
• Atlus 2005-2010
Gauntlet II
PixelSense 2.0
Methods and Techniques

- PixelSense SDK, PixelSense SDK -> Unity
- Fiducial Tracking (fiducials placed on physical entities)
- Xbox 360 controller
- Hands and movement
Thank you!

Questions?

Douglas Carlsson - douglasc@kth.se
Niclas Ericsson - neries@kth.se
Rasmus Ansin - ransin@kth.se
Individual Contributions

• Niclas
  – Graphics, programming
• Douglas:
  – Programming, level design
• Rasmus:
  – Programming, gamification
one player is controlling medicine inside the body
top down shooter
shots viruses and bacteria
ever bacteria
collaborative game around pixelsense
operate on body at same time
different scales?
white blood cells
motivation - learn about human body in fun way
infoboxes
bloodcells in body
collaborative experience and mechanics
fun experience to learn about human body
goals
learning exp
human immune system
cooperation and communication
challenges
pixel sense sdk with unity

related work
infection 72 hours
top-down shooter works for 2D floorplans
trauma center
markers on table - good!!!
ER experience -

...
Submarine in a Fish Tank

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Advanced Graphics and Interaction
AGI15
2015-11-10
Submarine in a Fish Tank
Motivation

Creating a relaxing and peaceful experience, while we learn more about:

• Stereoscopic 3D (AR like and 3D screens.)
• Model light, movement, physics in water
• Mesh drawing/generation/animation
Goals and Challenges

• **Goals**
  – Getting started in Unreal Engine and Blender
  – Simulate a very small submarine with scuba diver as 1:st person
  – Procedural generation of animated fishes.

• **Challenges**
  – Move from Blender to more advanced tools
  – Controls? Submarine hull or more like a jetpack?
  – Fish swimming is advanced math. Simplify!!
Related Work (maybe a Table?)

• Art-related performance, underwater wheelchair
  – Sue Austin
  – 2012
• “Boid” flock simulation
  – Craig Reynolds
  – 1986
• Review of Fish Swimming Modes
  – Sfakiotakis, Lane and Davies
  – 1999
A very small submarine

• Can we simulate a similar ride with Occulus and Unreal Engine?
“Boid” Flock Simulation
Fig. 10. Plan view of a horizontal layer of a fish school, showing its diamond-shaped building block structure.
Methods and Techniques

• Methods:
• Relaxing mood for the overall experience.
Individual Contributions

• Erik will do
  – A lot
  – So much
• Simon will do
  – Fluid simulation underwater, 3d-sound, models, other animations
  – Interaction and devices (Oculus sdk etc). Learning UnrealEngine.
• Mårten will do
  – Fine-tuning of non-trivial devices like Nunchuk, Occulus?
Feedback to Submarine in a Fish Tank

- small scuba diver - helmet
- outside of tank - skybox distorted by water and glass
- calming - not stressed
- don’t include movement.
- oculus roller coaster
- unreal engine
- blender
- drive around
- simplify interaction
- focus on graphics - natural motion of fish
- colors
- photorealistic?
- create models?
- YA3 camera movement
- related work
- boid
- underwater wheelchair
- how fish swim - acua-moose
- how do fish move
- how do schools move - Uppsala David Sumpter
- 3D sound
- submarine
- sony controller
- who is going to use?
- target audience?
- use the oculus to relax...

aquarium
digital pet?
tamaguchi pet - seaman for dream cast
giving camera control back to the renderer - make it look natural, relaxing, fun, interesting

References:
http://webglsamples.org/aquarium/aquarium.html
http://www.fishgl.com/
Spinnulator Project Proposal

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Vincent Wong
vwong@kth.se

Advanced Graphics and Interaction AGI15
2015/11/09
Spinnulator

Really cool image of your project!!
Methods and Techniques

Tech: Unity and Kinect

• We will use Kinect to track a player on an exercise bike.
• We will use body motion as our main mode of interaction.

• Players will move forward by cycling on the bike.
• Horizontal movement will be done by tilting your head.
• Players will have to navigate obstacles and hills.
Goals and Challenges

• Goals
  – To learn more about advanced graphics.
  – To learn to implement the Kinect in a new way.

• Challenges
  – Focusing on graphics will take a lot of knowledge.
  – We need to get clear tracking with the Kinect.
Related Work

• Tour de Rue
• Temple Run
Tour de Rue

• Uses a stationary bike tracked by a Kinect
• The player can bike through environments in Google Maps
• Provides no real goal/challenge.
Temple Run

• Simple smartphone gameplay
• Three lanes
• Switch lanes with motion
• Avoid dangers, collect coins
Litterature review

• Real-Time Cloud Rendering for Games
  – Mark J. Harris
  – 2013

• Fast realistic lighting for video games
  – A.Iones, A. Krupkin, M. Sbert, S. Zhukov
  – Unknown publication year

• Bump mapping
  – James F. Blinn
  – 1978
Real-Time Cloud Rendering for Games

• Cloud rendering involves scattering light for realistic appearance, expensive if done much.
• Precomputed clouds can be used to “mask” weaknesses.
Fast realistic lighting for video games

• Different kinds of lighting can change how real a game looks.
• We need fast rendering, but still want it to look real.
Bump Mapping

- Used to create a realistic feel on any object
- Bumpy surfaces can be achieved even though the surface of the underlying object is flat.
Work Plan

Week 1: Set up game environment to track with Kinect

Week 2: Polish tracking, start working on game

Week 3: Add mechanics and polish

Week 4+: Graphics work depending on time
Risk Assessment

• Our project depends heavily on good tracking with the Kinect.

• Multiple physical motions might be difficult for certain players.

• Testing and debugging will be very exhausting.
Thank you!

Questions?

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Robin Palmberg {robinpa@kth.se}
Vincent Wong {vwong@kth.se}

Teacher: Mario Romero {marior@kth.se}
Focus on graphics from week 1!

- unity and kinect
- player on bike
- head - spine
- focus on graphics
- implement the kinect for biking
- shoulders
- basic game idea
- simple obstacle
- Tour de Rue
- track player on stationary bike
- no real or challenge
- Temple Run
- avoid obstacles and grab coins
- bike is not instrumented
- real-time cloud rendering
- expensive, scatter light
- fast-realistic lighting for video games
- ambient
- bump mapping - create more depth to model
- kinect first week
- spinning class

legs up and down
- ti sensor tag

how do you handle long-time player? excessive movement?
- track feet and head

overkill to use kinect
- sensors on bike? - ti sensor tags
- Feet movement
- Color marker on pedals from side view
- Head band

References for inspiration:
http://www.sciencedirect.com/focus.lib.kth.se/science/article/pii/S0097849306000859
http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.70.9689&rep=rep1&type=pdf#page=29
Project 2 proposal

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Robert Amino
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Advanced Graphics and Interaction
AGI15
2015/11/10
Motivation

• Experience spray painting using Kinect

• Explore texture mapping of 3D objects in Unity

• Creating a platform to experiment perpective paints
Goals and Challenges

• Goals
  – Full body usage
  – Realistic aiming
  – A fun painting experience

• Challenges
  – Body mapping
  – Kinect integration
  – Development environment
Related Work

• Kinect Paint
  – Painting with hands, control with hands, no external input device
  – https://paint.codeplex.com
  – https://www.youtube.com/watch?v=Ycgb3LB6wkA

• Kinect iPad palette painting
  – Painting with hands, color selection through external device
  – https://www.youtube.com/watch?v=WaR-eCtOb_Y
Kinect Paint
Kinect Paint with iPad
Related Work - Papers

A gesture-based virtual art program for children with severe motor impairments: development and pilot study

Kinect hand recognition and tracking

KinectDraw: A Kinect based digital tool to visualize 2D figures and edit them in real time

Kinect enabled motion based touchless drawing tool
Methods and Techniques

• Kinect
• 4K screen
• Unity (C#)
Thank you!

Questions?

Maxime Hulliger \{hulliger@kth.se\}
Prasanth Korada \{korada@kth.se\}
Robert Amino \{amino@kth.se\}
Teacher : Mario Romero \{marior@kth.se\}
Questions?
Feedback to SprayIT

Your references are all about the Kinect. Focus on graphics please! Make it easier on you and the user by defining a few colorless 3D models for people to paint on. Allow users to select a 3D area in order to mask it easily, so that the spray paint stays on target.

Body painting
Proc gen of spray painting
Kinect
Track body
Change camera angle
Paint 3d model
Explore Kinect
Unity
Painting texture
Simplify - paint by numbers
Force people to keep arm high
Realistic aiming
3d stereos 4k
Body mapping
General debate environs
Related work
Kinect painting games
We paint
Kinect

References:
http://dl.acm.org/citation.cfm?id=2656328
https://www.youtube.com/watch?v=xx5eMhTs5K0
Aerial

Sail Away
Proposal for Aerial

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Johan Huusmann
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Daniel Lindström
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Motivation

Create an interactive experience where you control a flying object in a calm environment, controlled by the movement of the head.
Goals and challenges

Goal: Create an enjoyable and aesthetically pleasing interactive experience

Challenge: Learn three.js / WebGL
Description

Prio 1: The user controls a paper plane soaring above ground indefinitely

Prio 2 (if we have time): Collect “fuel” while flying to reach as long as possible
Inspirational project 1

http://inear.se/beanstalk/
Inspirational project 2

http://lights.helloenjoy.com/
Inspirational project 3

Methods and techniques

WebGL™ with THREE.js

socket.io

node.js™
Feedback to Aerial

Smooth experience
Movement of head
Quadriplegics
Spine injury what vertebrate
Three.js webgl
Phone gyro - websocket
Focus on graphics
1 - paper plane in the air floating with currents
2 - collect dandelions
Flower PS3
4k stereo
Playfulness
Playification
Plane lands
Modular elements
Look at the references I have given other projects with similar aesthetic goals.
Look at clouds, fog, light dispersion, rain, snow...

References:
Sneak preview/example

http://ctrlaltdelete.nu/example
Remember?

- Working core with simple graphics
- Freedom to fail on individual elements
- Show work
  - Research
  - Paper reading and understanding
  - Development
  - Integration
- Write a short individual report – December 11
  - At most
    - 1000 words
    - 3 references
    - 3 figures
    - 1 video-figure
- If working, working code
- Group deliverables hold: web, video, text
Thank you!

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