

# Advanced Graphics and Interaction 2014: Lecture 17

LasAR



DuelAR



WeathAR



Proposals Projects 2

Mario Romero  
2014/11/11



# Course Schedule

1.	Wed Sept 03 13-15	Lecture 1	Intro
2.	Fri Sept 05 15-19	Lectures 2-3	Group Formation and brainstorming
4.	Wed Sept 10 13-15	Lecture 4	Proposals
5.	Thu Sept 11 10-12	Lecture 5	Feedback on proposals
6.	Mon Sept 15 8:30-10	Lecture 6	Hello World! Demos
7.	Thu Sept 18 10-12	Lecture 7	Demo Day and ForskarFredag Planning
8.	Wed Sept 24 14-16	Lecture 8	Demo Day!!!
•	Thu Sept 25 16-20	Debaser Invasion	Setup 16:00 – 20:00
•	Fri Sept 26 8-18	Debaser Domination	ForskarFredag 2014!!!
9.	Mon Sept 29 9-10	Lecture 9	Reflections of ForskarFredag
10.	Wed Oct 8 13-15	Lecture 10	The past and future of YA3 and PodRacer
11.	Mon Oct 13 8:15-10	Lecture 11	Epson Moverio – Project 2 industrial sponsor
12.	Wed Oct 15 13-15	Lecture 12	The past and future of 2Pac and Space Survival
•	Wed Oct 29 16-23	Kista Mässan Invasion	Setup 16:00 – 23:59
•	Thu Oct 30 -Sun Nov 2, 9-19	Kistamässan Domination	COMICON 2014!!!
13.	Tue Nov 4 10-12	Lecture 13	Reflections on ComiCon
14.	Wed Nov 5 10-12	Lecture 14	New groups
15.	Fri Nov 7 15-19	Lectures 15-16	Epson Moverio Workshop
17.	Tue Nov 11 10-12	Lecture 17	<b>Proposals</b>
18.	Tue Nov 18 10-12	Lecture 18	Feedback on proposals. Early hello world dem os
19.	Tue Nov 25 10-12	Lecture 19	Hello world !demos
20.	Tue Dec 2 10-12	Lecture 20	<b>Demo Day!!!</b>
•	<b>Thu Dec 4 15-18</b>	<b>VIC Invasion</b>	<b>Prepare Open House</b>
21.	<b>Fri Dec 5 15-19</b>	<b>Open House</b>	<b>AGI14-VIC Open House</b>

# Agenda

1. This week:
  - Thursday CGI demos
2. Proposals
  1. LasAR
    - Carl
    - Anton
    - Johan S.
    - Ludwig
    - Christoffer
  2. DuelAR
    - Philip
    - Søren
    - Axel
    - Daniel
  3. WeathAR
    - Linnea
    - Stefan
    - Johan
    - Mattias
    - Oskar

# Proposal for LasAR



Carl  
ahrsjo@kth.se



Anton  
awarnhag@kth.se



Johan  
johansto@kth.se



Ludwig  
ludwigpe@kth.se



Christoffer  
cwiss@kth.se

Advanced Graphics and Interaction

AGI14

2014/11/11

# LasAR



# Motivation

- *We* want to play lasertag again
- *You* want to play lasertag again
- We want to learn about Android development, the Wikitude API and the interaction between multiple Moverio's.
- AR interaction is not that fun today. We aspire to create a fun and interactive experience for the users!

# Goals and Challenges

- Goals
  - Multiplayer.
  - Interactive and useful 3D-objects in AR.
  - Fun!
- Challenges
  - Accurate tracking of position.
  - Environment modeling.
  - Network.

# Related Work

- PSYCLOPs
  - Sean Mc Cracken
  - 2014
- Location based Application for Mobile Augmented Reality
  - Gerhard Reitmayr & Dieter Schmalstieg
  - 2003
- Exploring the interaction design space for interactive glasses
  - Lucero et.al.
  - 2013



# PSYCLOPs



# Exploring the interaction design space for interactive glasses

- (+) General specifications, issues and user experience using Interactive Glasses.
- (-) Nothing location based, trying to eliminate other interaction other than looking around.



**Figure 4.** A sample flight trajectory of a butterfly carrying a notification.



**Figure 5.** Butterflies for incoming Twitter (left) and Facebook (right) notifications.



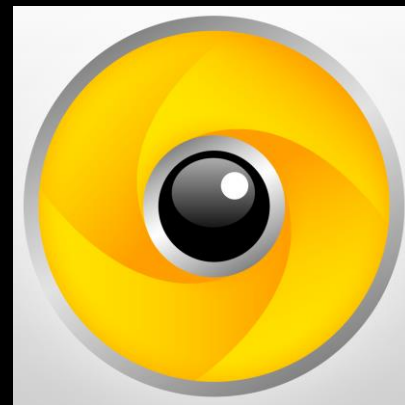
**Figure 6.** A Twitter message is shown on the glasses' display.

# Location based Application for Mobile Augmented Reality



- (+) Indoor location based Augmented Reality application. Tracking relative position.
- (-) Old (2003). Using fiducials.

# Methods and Techniques



# Thank you!

## Questions?

Carl Ahrsjö {[ahrsjo@kth.se](mailto:ahrsjo@kth.se)}

Anton Warnhag {[awarnhag@kth.se](mailto:awarnhag@kth.se)}

Johan Storvall {[johansto@kth.se](mailto:johansto@kth.se)}

Ludwig Pethrus Engström {[ludwigpe@kth.se](mailto:ludwigpe@kth.se)}

Christoffer Wiss {[cwiss@kth.se](mailto:cwiss@kth.se)}

# Feedback to LasAR

1. Keep it simple
2. Build a sharp shooting game first as “Hello World” Demo
3. Encapsulate functions
4. Have a working core before you add fanciness
5. Stay away from open problems in computer vision and AI
6. What is your gun?
7. What is your trigger?
8. What will you show on the sight?
9. Will you use a laser pointer?
10. Will you use a reflective vest or other type of marker to clearly identify targets?
11. Use your limited field of view as a game feature, not a limitation
12. Think of the details before you get to work and prioritize
13. XXL crossbows?
14. Indoor localization with 802.11 network triangulation? Really needed?
15. SLAM – simultaneous localization and mapping – be careful!
16. What else can you use for targeting other than computer vision?
17. Remember, this game needs to be played indoors for the demo.
18. CHEAT on the engineering of the infrastructure and focus on the interaction and advanced graphics!!!

# Pseudo AR + a new Network Model



# Pseudo AR

Overlay VR with assumptions:

- Predetermined Environment
  - stationary players
  - ground, walls etc.
- FoV matching real world
- Exploit imprecision in locating moving objects



# Lag Smoothing Network Model

Assumptions:

- Each client experience real-time within a fixed, non-overlapping, area.



# Implementation: Epic Spell Duel

Limitations:

- Stationary players at some distance  $d$
- Only non-static objects
- Simple Input





thank you

# Feedback to DuelAR

1. Good idea to exploit imprecision and lag
2. Figure out the simple input you need
3. Perhaps the Leap Motion
4. Perhaps colored gloves and color recognition
5. Check out Erghis

# WeathAR



Advanced Graphics and Interaction

AGI14

2014/11/11

# WeathAR



2014-11-11

AG14



# VIDEO

- <https://www.youtube.com/watch?v=io0-S9pU6vM>

# Motivation

- Why leave the house if you can bring the weather inside?



# Goals and Challenges

- Live feed: Weather data on location
- Different weather types, what to show etc.

# Methods and Techniques

- Wikitude SDK
- [Openweathermap.org/api](http://Openweathermap.org/api)



# Thank you!

Stefan Etoh, {[etoh@kth.se](mailto:etoh@kth.se)}

Johan Bäckman, {[johba@kth.se](mailto:johba@kth.se)}

Linnea Blom, {[lblo@kth.se](mailto:lblo@kth.se)}

Mattias Lönnerberg, {[matlon@kth.se](mailto:matlon@kth.se)}

Mario Romero {[marior@kth.se](mailto:marior@kth.se)}

# Feedback to WeathAR

- Your idea needs refinement
- Why use AR when you can do it with a phone?
- You can control time and space
- Show the past, the future, the seasons
- Show other places on Earth at the current time and at other times
- Show special weather and phenomena (Northern Lights)
- Show weather patterns by bringing them down to ground level
- Interaction? Menus? Buttons? Gesture Commands?
- Use satellite images to recreate realistic clouds?
- Use the stereoscopy on the glasses to get close to the weather
- Control time by speeding it up as in time-lapse videos

# Overall Feedback

- LasAR have thought a lot about their project, but have proposed a very difficult project. Simplify and Prioritize.
- DuelAR have thought a great deal about the limitations of the platform and have started the task of incorporating the limitations into the experience. Good!
- WeathAR needs to answer the question: why would you use AR for this?

# Current Hardware Requirements

Group	Moverio	Motion
LasAR	2	
DuelAR	2	2
WeathAR	2	

# Remember Assignment 6

The goal of this assignment is to create four documents on how to present your projects One, including how to run, recover, troubleshoot, and answer technical questions about it. It has two parts. The first part is individual. The second part is in group.

## Part 1

1. Write a step-by-step description of how to set up, run, recover, and trouble shoot each of the three projects that are not your own. Do not ask anyone. Do the best you can.
2. Write a script on what to say and in what order to present the three projects that are not your own.
3. Write a number of questions about the project that you have and don't know the answer to.
4. Submit these document here.

## Part 2.

1. Create one Google Document per project. Share your files above with project descriptions with everyone that is not part of the project. For example, everyone but 2Pacs share their documents about 2 pacs.
2. Edit and complement each other's knowledge of the project.
3. When you have a completed document, send it to the group members. They will give you feedback, edit your document, fill in the gaps, and submit it here.

Remember: for the Open House, I will create a schedule where I make sure all of you present all the first projects.

# Thank you!

[marior@kth.se](mailto:marior@kth.se)

Questions?