Reflecting on Comic Con - Lecture 12

Mario Romero
2016/11/11

KTH VETENSKAP OCH KONST

VICSTHLM
VISUALISATION INTERACTION COLLABORATION

AGI16 Calendar: link

Tue 30 aug 13:00-15:00	Lecture 1: Introduction
Fri 2 sep 8:00 – 12:00	Lecture 2-3: Forming Groups and Brainstorming
Tue 6 sep 13:00 – 15:00	Lecture 4: Groups formed, inspiration, and brainstorming
Fri 9 sep 8:00 – 10:00	Lecture 5: Proposals
Tue 13 sep 13:00 – 15:00	Lecture 6: Proposal Feedback
Fri 16 sep 10:00-12:00	Lecture 7: Hello World Demos
Tue 20 sep 13:00 – 15:00	Lecture 8: Preparing ForskarFredag 2016
Tue 27 sep 13:00 – 17:00	Lecture 9: Demo and preparation towards ForskarFredag
Fri 30 sep 8:00 – 16:00	ForskarFredag (we set up on Thursday evening)
Tue 4 oct 13:00 – 15:00	Lecture 10: Reflecting on ForskarFredag
Tue 11 oct 13:00 – 15:00	Lecture 11: Preparing for Comic Con
Tue 1 nov 13:00 – 15:00	Lecture 12: Preparing for Comic Con
Fri 4 nov 9:00 – Sun 6 Nov 16:00	Comic Con (we set up on Thursday evening)
Fri 11 nov 10:00 – 12:00	**Lecture 13: Reflecting on Comic Con**
Tue 15 nov 13:00 – 15:00	Lecture 14: Forming groups for project 2
Fri 18 nov 8:00-12:00	Lecture 15-16: Proposals Project 2
Tue 22 nov 13:00-15:00	Lecture 17: Hello World Demo Project 2
Tue 29 nov 13:00-15:00	Lecture 18: Feedback on Demos
Tue 6 dec 13:00-15:00	Lecture 19: Preparing for Open House
Tue 13 dec 13:00-15:00	Lecture 20: Demo project 2
Fri 16 dec 15:00-19:00	**VIC AGI16 Open House**

Agenda

1. Announcements
    1. Photos
    2. Videos
    3. Web pages
    4. Open House Dec 16
    5. Terese's User Study
2. Discuss Project 2 Theme
3. Reflect on Comic Con
4. Example Proposals for Project 2
5. Examples of AGI15 P2s
6. Assignment 4 group work
7. Assignment 5 read Mixed Reality Stockholm proposal and think about applications for project 2

Project 2 Guidelines

- Mixed Reality Stockholm
  - AR Guided Bus Tours
  - AR Guided Walking Tours
  - MR Guided Museum Tours
- Techonologies
  - Phones
  - Vuforia
  - Argon.js
  - WebGL
  - Three.js
- Not this please!
  - Link

Reflecting on Comic Con

goo.gl/mXwdbD

- Talk to your neighborgs
- Discuss
  - What worked?
    - Better than expected
    - As expected
    - Not as well as expected
  - What was unexpected?
  - What did you learn?
  - What can you apply to P2?
  - What will you change for P2?
  - Other comments
- Add new items to online Slides

Virtual Reality for Production

Andrea de Giorgio, PhD candidate at ITM/IIP
Mario Romero, associate professor at CSC/CST

November 11th 2016

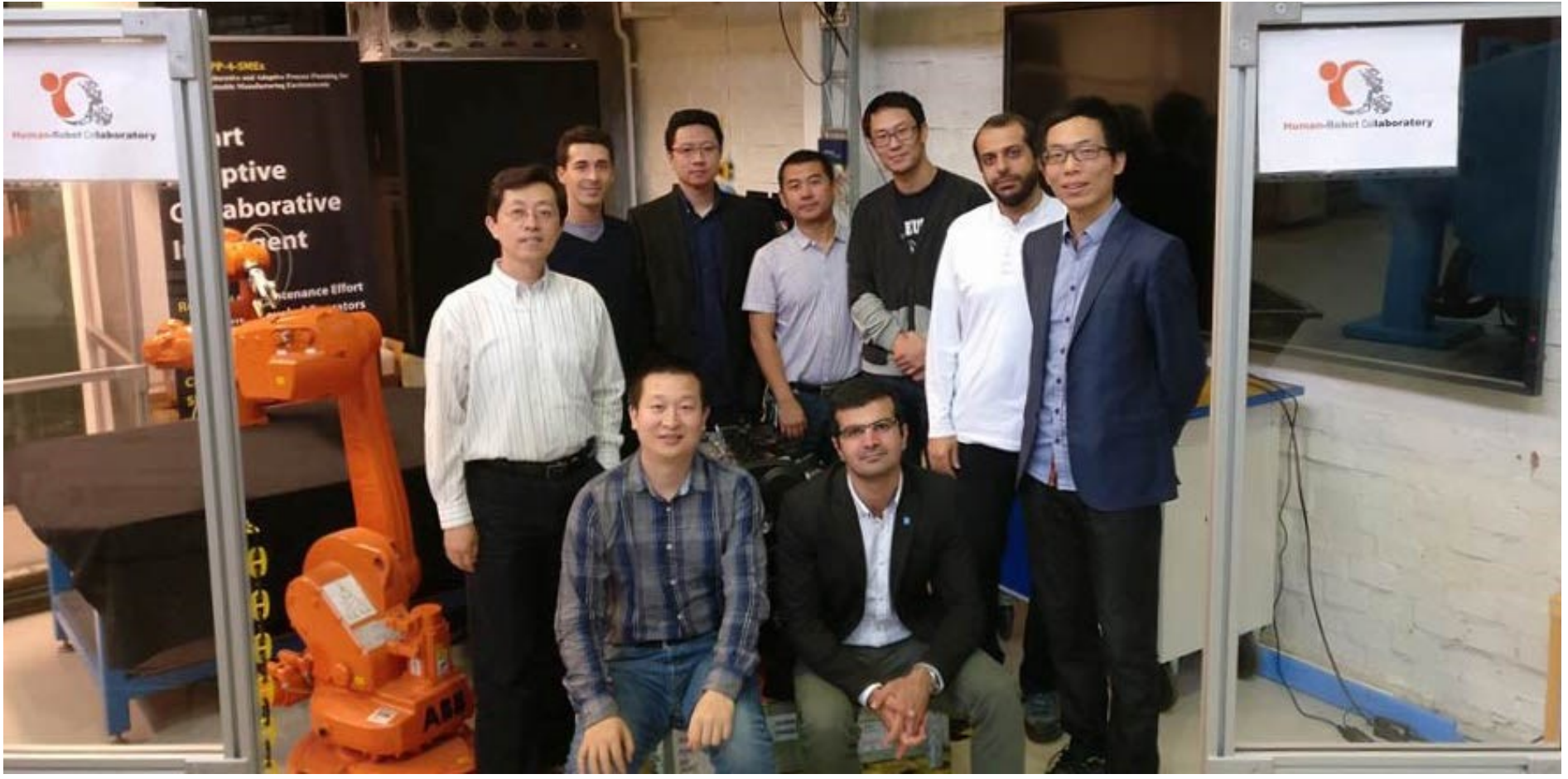
VIC Studio – KTH Royal Institute of Technology

Production engineering

The branch of engineering that is concerned with the production of industrial goods, especially by the design of efficient plants and procedures and the management of materials, energy, and labor.

Industrial robots are largely used in production and many researchers at KTH are contributing to their improvement.

Production engineering at KTH/ITM school

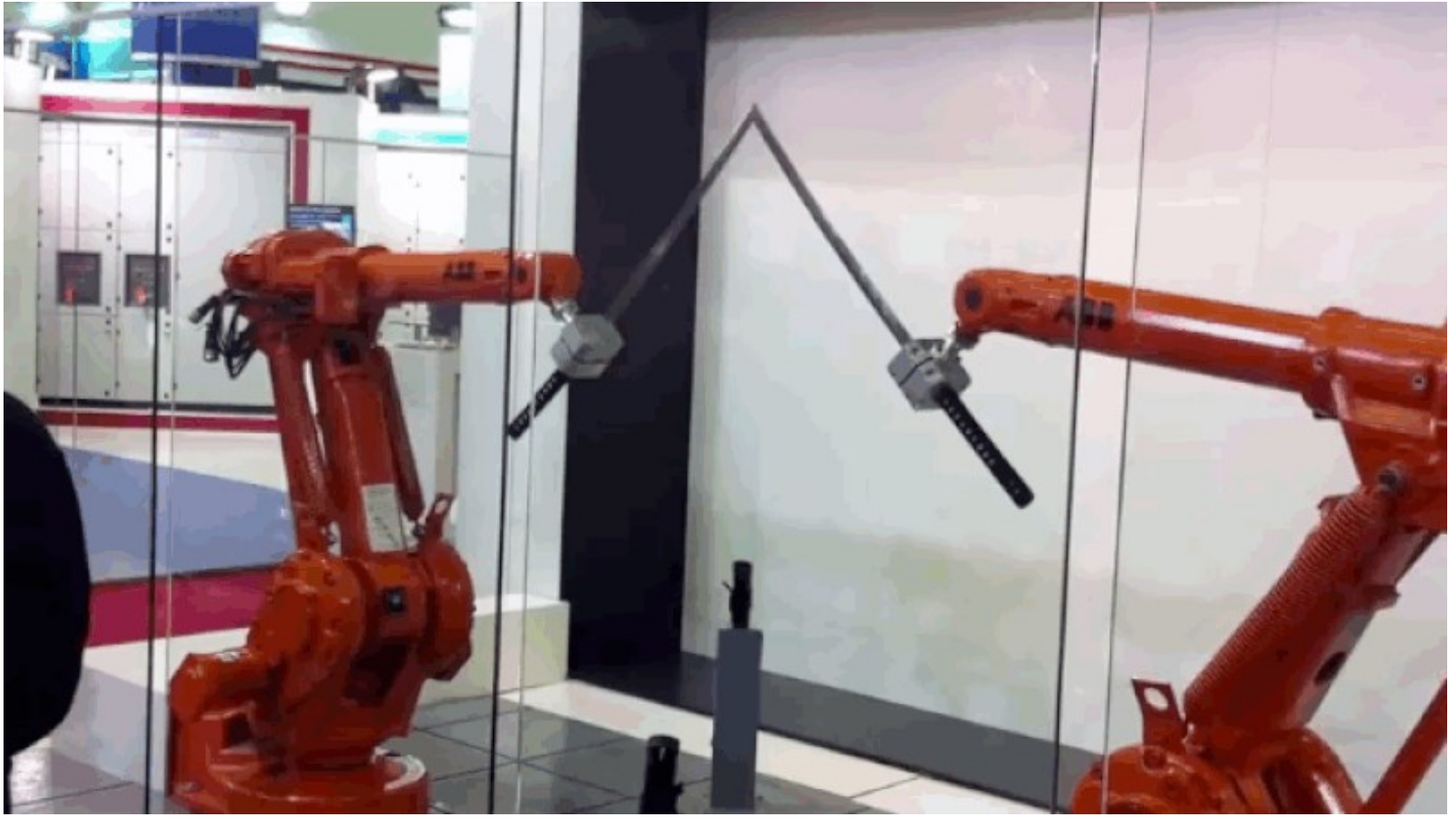


Example: Production line

Example: Museum experience 1

Example: Museum experience 2

Example: Ninja robots

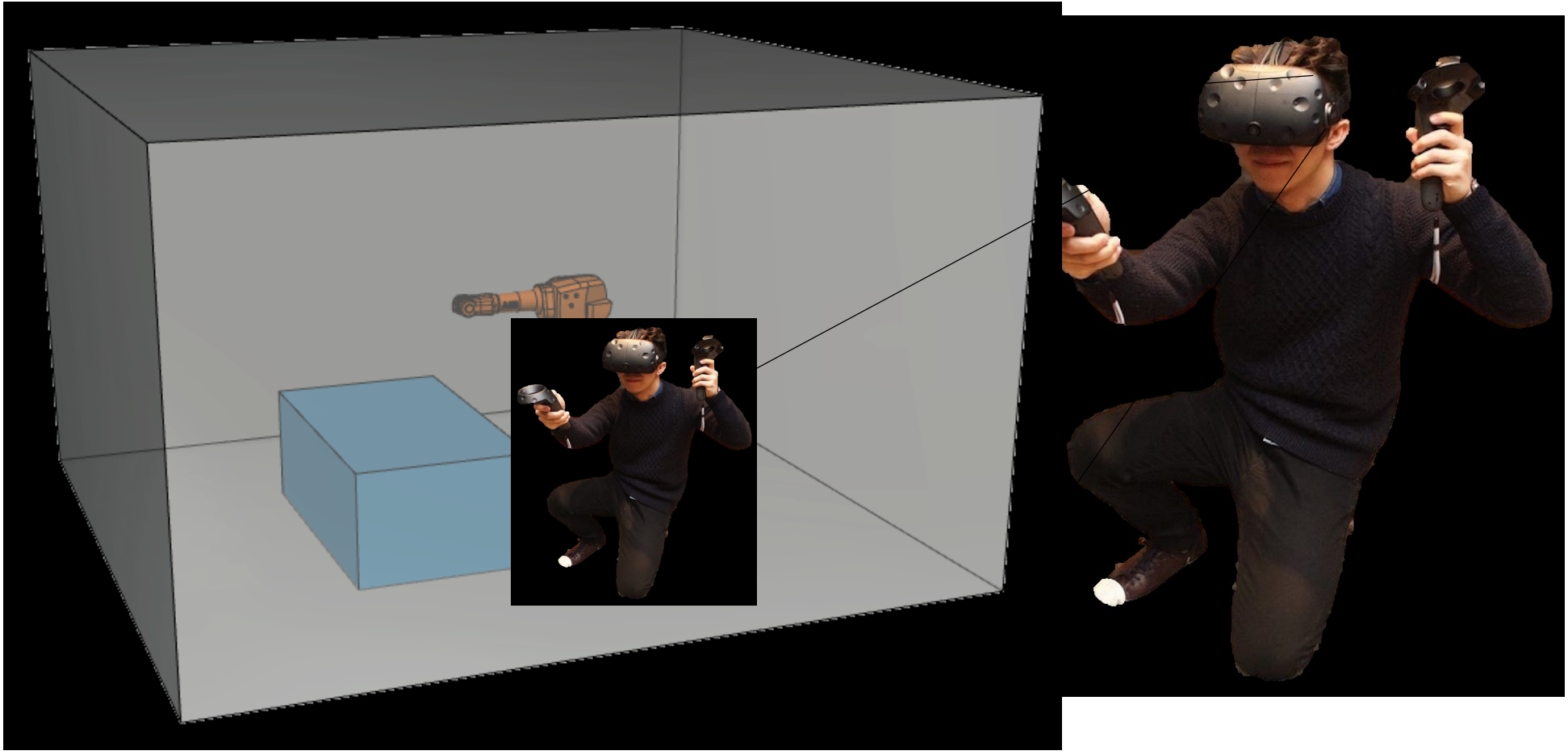


What all those images have in common?

What all those images have in common?

A CAGE!

Virtual reality can bring the operator in the “cage”



Project for the students

Industrial Production at KTH/ITM school can propose a project aimed to **develop a virtual reality environment** for the robot manipulators that both industrial operators and museum visitors can use to perform tasks of **human-robot collaboration** in total safety.

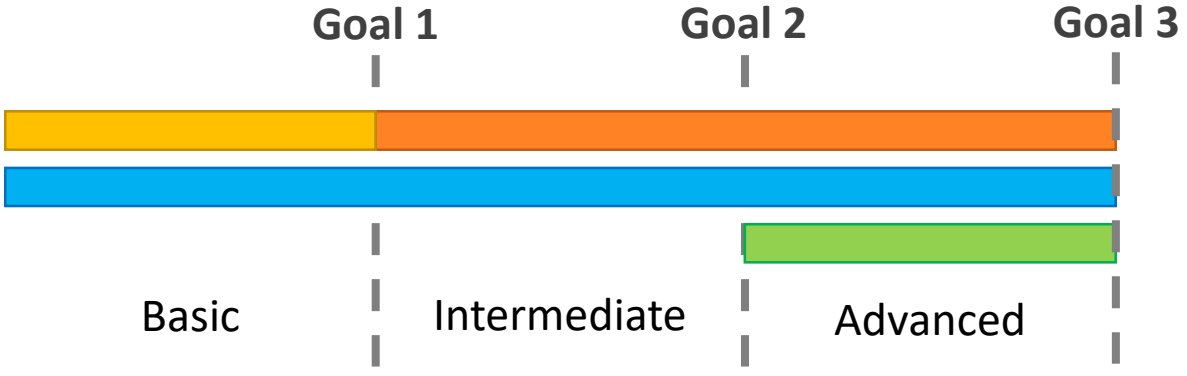
Available technologies

ABB robot(s)

ROS industrial

unity

Goals (1)

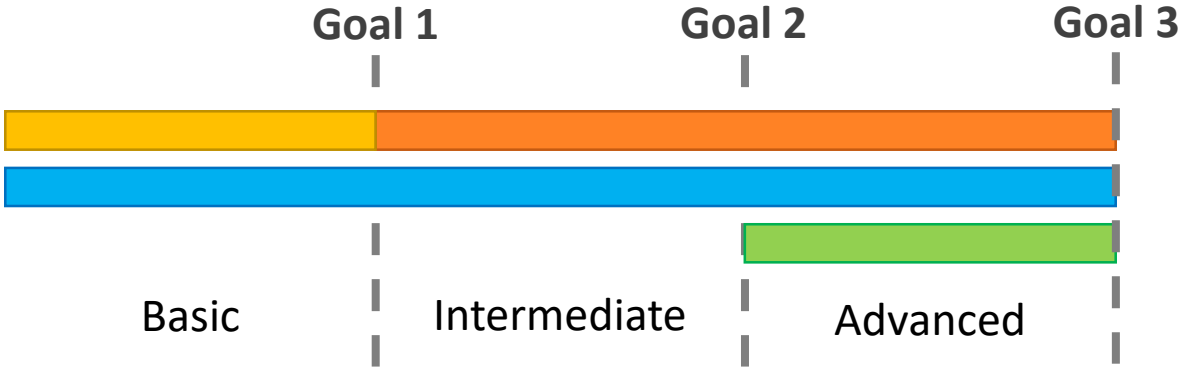


1. Develop **kinematic model** of an industrial robot (ABB) in **Unity**;
2. Develop **dynamic model** of the robot in **Unity** (up to the project requirements);
3. Develop a **human-robot collaboration task** in **Unity** and simulate it with **HTC Vive**;

   This is the core of the project and it's open to your creativity!

4. **Control the real robot** with the help of **ROS Industrial**;

Goals (2)

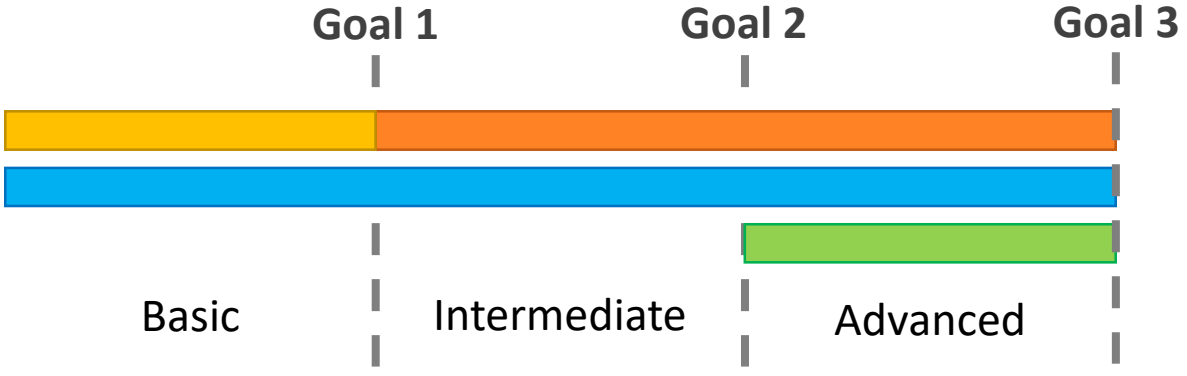


Basic. The kinematic model of the industrial robot allows to represent the 6 joints imported from CAD models in all the valid positions in space. **A simple human-robot collaboration task is performed as demo with HTC Vive** (e.g. change positions of joints with hands).

Intermediate. Thanks to the dynamic model it is possible to simulate the motion of the robot manipulator. **An intermediate human-robot collaboration task is performed as demo with HTC Vive** (e.g. the robot reacts to human movements while moving itself).

Advanced. With the help of **ROS Industrial** it is possible to control the real robot from the virtual reality and **perform an advanced human-robot collaboration task as demo with HTC Vive and the real robot** (e.g. the robot performs a real task and the human influences it from the virtual reality environment).

Goals (3)



Goal 1. This is the easiest goal and it ensures a passing grade. In order to fulfill it, the basic task needs to be presented at the end of the project and the project reported.

Goal 2. The intermediate task gives access to all grades (depending on the quality), if presented at the end of the project, that is also well-reported.

Goal 3. The advanced task presented at the end of the well-reported project grants full grades and the possibility to continue with a thesis to the outstanding team members.

A good suggestion is to reach the goals one by one.

Possible future research (theses for students)

- Training and recruitment of operators (factory simulators) in offline mode;
- Remote work and monitoring;
- Safety of operators (the operator in VR is 100% safe but provides real input on collisions with any speed of the robots);
- Production planning and simulation with human interaction;
- Embodiment (personification of limits and advantages of the robot);
- Your suggestions can be discussed!

Thank you!

I am **Andrea de Giorgio.com**

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Reflections from Comic Con 2016

AGI 2016-11-11

What Worked better than expected?

- Limited area
- Transition between projects and context switches.
- VR
- Highscore list
- Instructing childrens
- Crowd understood that it was not a perfect project
- Moving all the hardware
- Whiteboard highscores
- Children can use the vive
- Phones battery consumption manageable
- Crowd control
- Interviews and news articles
- Only one person complained about motion sickness (on our project presentation)

What Worked as expected?

Scheduling (except the first day’s start)

Catching attention through Pixelsense while queueing for HTC.

A lot of interest for VR/the Vive

We can draw a crowd!

People like to play with friends

Hardware

What Worked not as well as expected?

IR pollution

A lot of kids had to small heads (and arms) for the Vive

Vive controllers and headset was lagging

Poster placement. Posters where not were the project was being presented.

Queue organization problems

Sometimes confusion where the users didn’t know that Pixelsense and HTC were connected.

Sound level

The queue

Phone hardware limitations

Wiimote precision imprecise

Bugs!

Moar bugs!

Gameplay balance

What was unexpected?

- More people in queue
- The demographics
- Less cosplayers than expected that would have massive armor and make tracking harder (Kinect)
- Gameplay had higher replayability
- Number of people were fewer
- Pollution from the other Vive devices

bugs bunny

What did you learn?

A lot of different technologies.

Prefabs are the shit!

And also, game engines are good

Møre people have experience with VR that expected

We should spend more time testing the games

Do not haphazardly combine technologies

Do not use Wii-motes

DO NOT EVER USE KINECT

Psvr has potential, fo sho

Networking sucks (+4)

Language barrier for small kids

People worry about how the look while playing and do not want to look weird

The need for a graphical artist

That people only gives feedback on the physical color of a tower.

Contacting PR can be a challenge

Color perception change

What can you apply to P2?

- Start prototyping early
- Choose easily available hardware
- Get your hands dirty as soon as possible
- Make more intuitive, should not require tutorial
- Try to reuse as much as possible.
- Stay away from networking (+1)
- Previous knowledge in engine of choice.
- Not to use wiimote, kinect
- More focus on gameplay

What will you change for P2?

Change game engine

Now focused, less weird stuff

More weird stuff

No networking (hopefully)

Focus on a single **reliable** technology.

Concrete plan before starting to develop

Try to get a graphical artist

Other comments?

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Fun was had ㅋ ㅋ ㅋ ㅋ ㅋ ㅋ ㅋ ㅋ ㅋ

Make comic con great again

People's goals and interests are important and how we align these are crucial to the end result

Assigment 4
Class work for next Lecture L14

1. Break up into groups where at least one person read the papers
2. Pull out the papers and present them to those who did not read them
3. Ask and answer questions
4. Discuss how you can incorporate the lessons from the paper into project 2

- Please, read these four papers and be ready to answer a few short questions and to discuss the papers next lecture, on November 1.

1. Morgan McGuire and Andi Fein, Real-time rendering of cartoon smoke and clouds.
Smoke, Cartoon, Non-photorealistic rendering

2. Mine, M., Yoganandan, A., & Coffey, D., Making VR work: building a real-world immersive modeling application in the virtual world
Game controller design, Immersive game experience, Virtual reality

3. Foltin, Martin (2011)., Automated Maze Generation and Human Interaction
Procedural generation, mazes, algorithms

4. Plemmons, Daniel; Holz, David, Creating next-gen 3D interactive apps with motion control and Unity3D.
Motion controller, Game engine, natural interfaces

Assigment 5

For next Friday Nov. 18

We will discuss these in class

- Read about
  - Vuforia
  - Argon.js
  - WebGL
  - Three.js
  - MacIntyre, Blair, et al. "The Argon AR Web Browser and standards-based AR application environment." *Mixed and Augmented Reality (ISMAR), 2011 10th IEEE International Symposium on*. IEEE, 2011.

Questions?