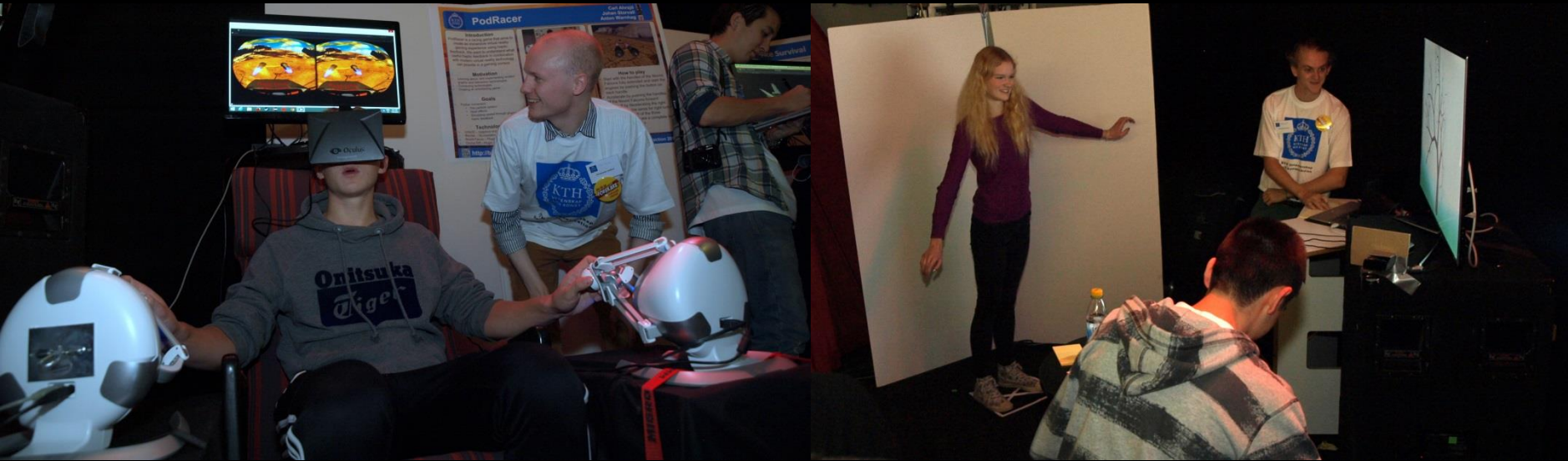


Advanced Graphics and Interaction 2014: Lecture 10



The past and future of PodRacer and YA3

Mario Romero
2014/10/08



VICSTHLM
VISUALISATION INTERACTION COLLABORATION

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	Proposals
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	Demo Day!!!
•	Thu Dec 4 15-18	VIC Invasion	Prepare Open House
21.	Fri Dec 5 15-19	Open House	AGI14-VIC Open House

Agenda

1. PodRacer
2. Particle Systems
3. Next Lecture: Epson Moverio
4. Break (Media Technology Day)
5. YA3
6. Non-photorealistic rendering
7. ComiCon

Remember: Deliverable Oct 28

- Working VIC Demo
- Code with good comments
- Webpage with:
 - Description
 - Goal and motivation of the project
 - Explanation and Justification of the graphics and interaction technologies used and developed
 - Challenges
 - Obstacles
 - Related work
 - Lessons learned
 - Photos
 - "Making of" documentary (2 minutes)
 - Demo Reel (30 seconds)
 - Optional PR material (logo, trailer, flyers, posters, catalog)
 - User testimonials (what did people say)

Pod Racer 1.0

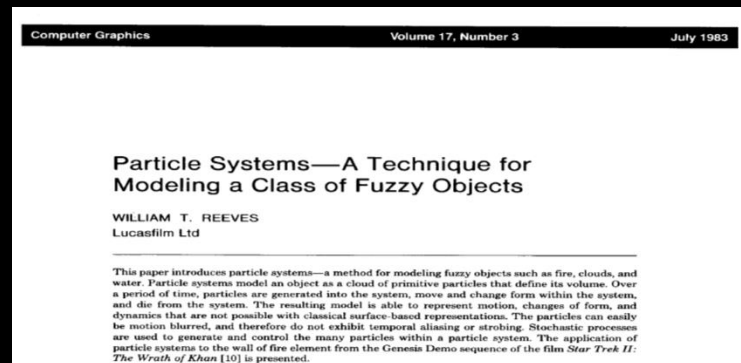
- Blender (Models)
 - Engines
 - Car Saab 900
 - Chair
 - Dashboard – imported
 - Could not import materials from blender
 - No textures and shading
 - Joints and rigid bodies on the cables
- Unity (Rendering)
 - Terrain
 - Height map
 - Added rocks
 - Texture mapping
 - Rocks
 - Sky box
 - Lighting
 - Directional light
 - A bit of ambient
 - Shaders
 - Element properties
 - transformations
 - Weights
 - Rigid bodies
 - Drag
 - Spring joints
 - Hovering car control script
- Falcon
 - Falcon unity plugin
 - Arbitrary range
 - Feedback
 - Fixed update
 - No force on z
 - More bumps
 - Forces → straighten
 - Rocket scripts
- Oculus – not interesting!
 - Why?

Pod Racer 2.0

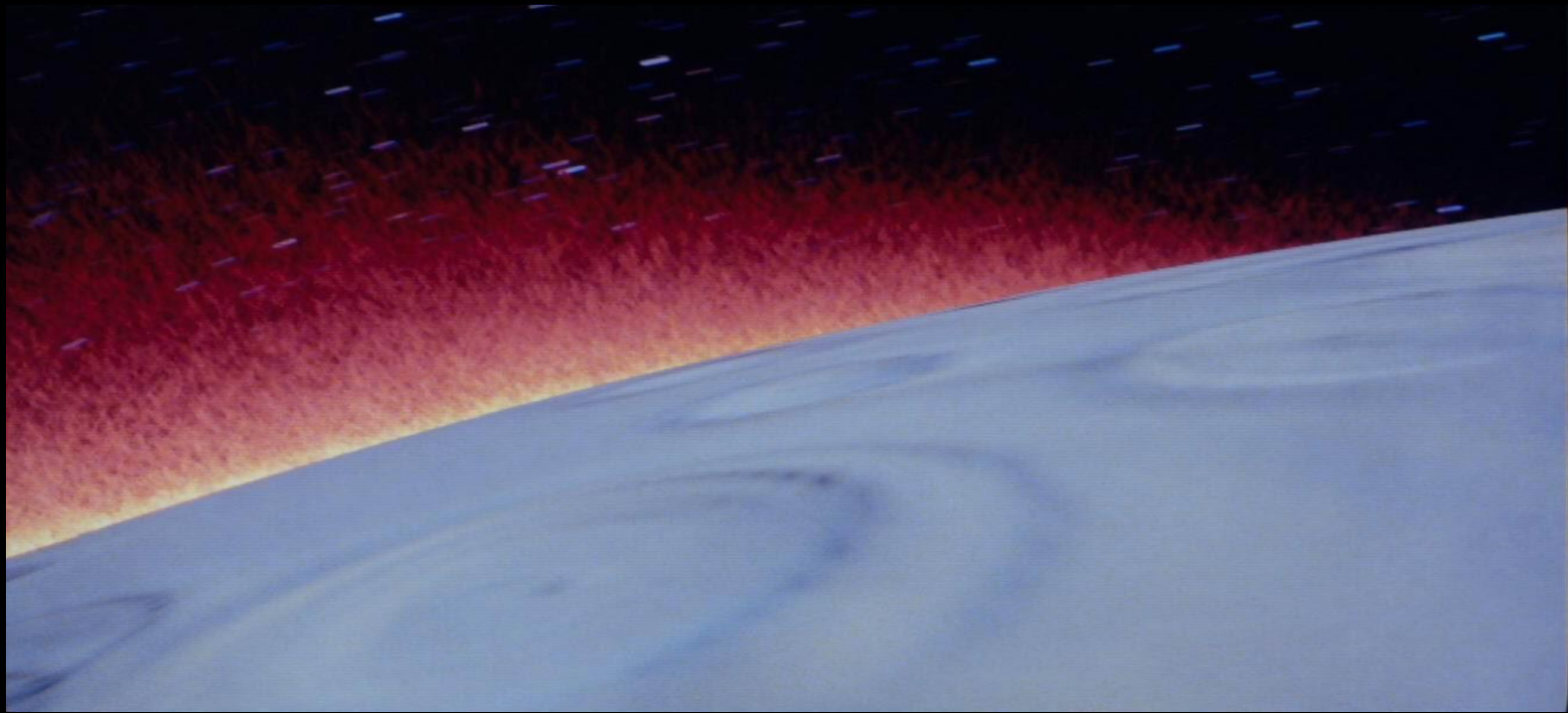
- Tweak interaction + track → initial balancing
- Video tutorial
- Balancing forces
- Damaged model
- Game-state visualization on panel (thrusters, maps, fuel?)
- Animated model of levers mapping falcon input
- Soundscape
- Fire particle system

Particle Systems

- Original Paper
 - Particle Systems A Technique for Modeling a Class of Fuzzy Objects
 - ACM SIGGRAPH 1983
 - William Reeves
 - Let's read the paper



Demo



Paper's Abstract

- Model fuzzy objects
 - Fire
 - Clouds
 - Water
- Particles = primitives of a volume
- Shape of volume is non-deterministic (stochastic)
- In time:
 - Generated
 - Move
 - Change
 - Die

Model (Algorithm)

1. Generate new particles
2. For all particles
 1. Assign individual attributes
 2. If too old, kill
 3. Else, transform = $f(\text{dynamics})$
3. Render image of living particles

Exercise at home

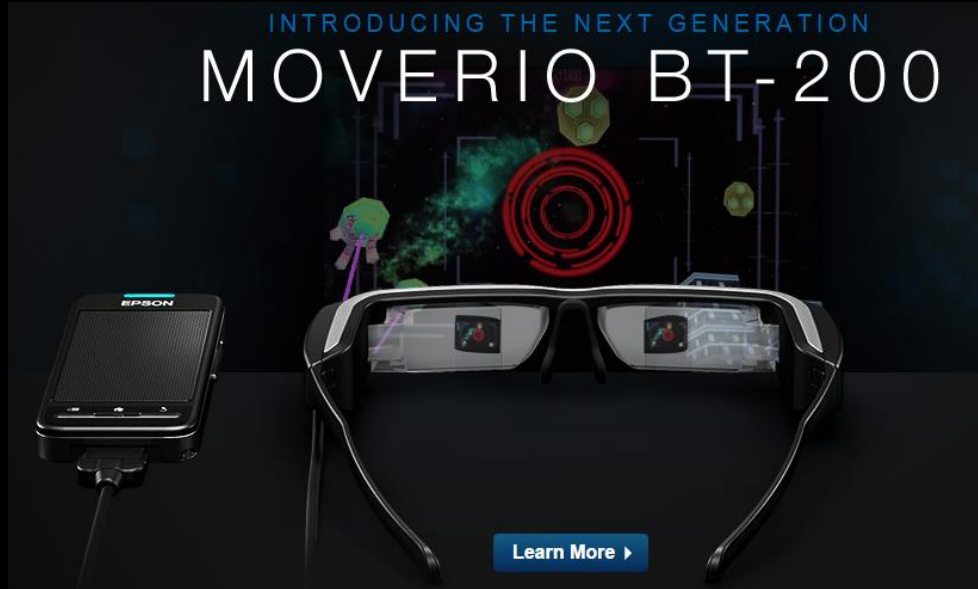
- Simple Particle System
 - [Link](#)
- Understand Code
- Modify to
 1. Simplify to one particle with simple trajectory
 2. Interactive Particle Cannon
- Share through FB wall



Pod Racer 2.0

- Fire Particle System
 - Depicting fire and other gaseous phenomena using diffusion processes, Stam J., Fiume E. ([1995](#))
 - GPU simulation and rendering of volumetric effects for computer games and virtual environments, Kruger J, Westermann R. ([2005](#))
 - Modeling and animation of fire, Ding W. et. al. ([2004](#))
 - Voxels on fire, Zhao Y. et. al. ([2003](#))
 - A CG simulation of fire using particle systems and hypertextures, Baekkelund C. et. al. ([XXXX](#))
 - Synthesis of cartoon fire based on hand-drawn samples, Gu Y., Yu J. ([2010](#))

Next Lecture: Epson Moverio for Project 2



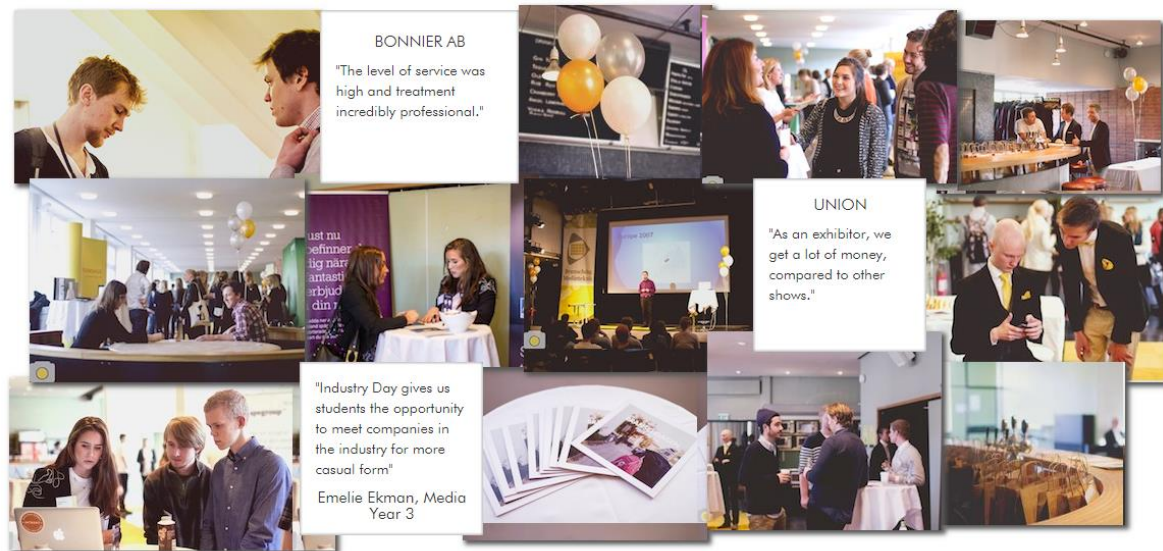
Vadim Couthon

National Sales Manager at **Epson** Europe



Augmented-reality see-through heads-up display.

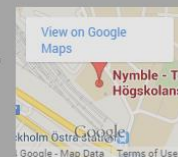
Break

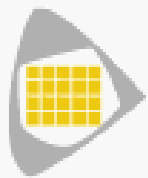


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www.mediateknik.com

Queen Christina route 15
114 28 Stockholm
Stockholm



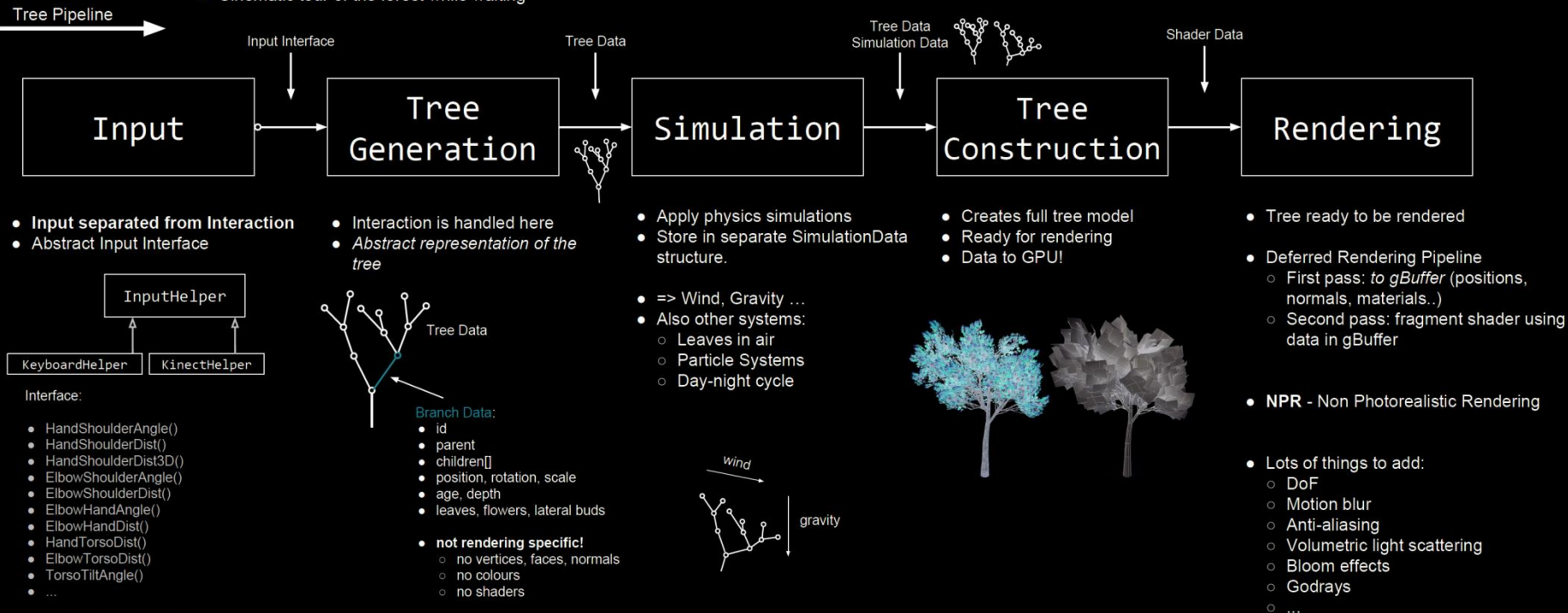


BRANSCHDAGEN 2014

- If you are interested in volunteer to participate, email me as soon as possible.
- We coordinate with: **Sandra Liljeqvist** sanlil@kth.se
- Here some info:
 - <http://www.branschdag.com/omoss>
 - the exhibitors will be Outfox, TV4, Sveriges Ingenjörer, Bonnier, SVT, My Academy, Starcom, Vitt grafiska, Unionen, Qasa and KTH Innovation and the lectures will be given by Bonnier, Outfox, Kapero and Spotify.

Gameplay YA3 1.0

- Gameplay encapsulates tree pipeline
- search-for-player loop
- Cinematic tour of the forest while waiting



Logging, Debugging:

- log Actions
- replay sessions
- use debugging view
- behavior statistics

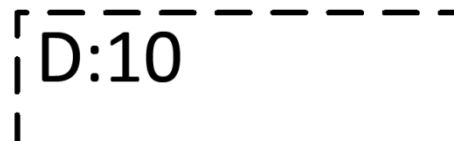
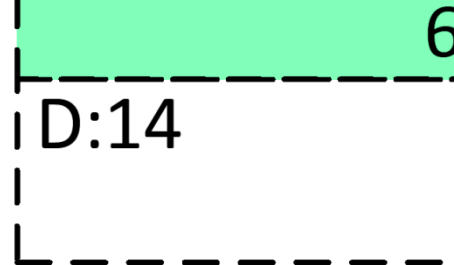
YA3 2.0

- Logging
- New mappings
- Forest
- Simulation → wind, gravity
- Level of Detail: leaves, color, textures
- Non-photorealistic Rendering

Non-photorealistic Rendering

- To be continued...

ComiCon - Gamex



Thank you!

marior@kth.se

Questions?