Advanced Topics in Computer Graphics and Vision

Fall Semester 2010

Prof. Dr. Markus Gross
Prof. Dr. Mark Pollefeys
Prof. Dr. Ruigang Yang
Dr. Luca Ballan
Dr. TiberiuPopa
CengizOztireli

http://graphics.ethz.ch/
Goals of the Seminar

• Get you acquainted with and excited in computer vision and computer graphics research
• Improve your ability to critically read and analyze scientific papers
• Strengthen your presentation skills
• Stimulate active learning through group discussions
• Improve your argumentation skills
What you have to do

• Present one paper in class
  – read the paper and necessary background material
  – prepare slides and give the presentation

• Read the other papers before class

• Attend the seminar!

• Participate in the discussion

• Grading: 75% presentation, 25% group discussion
Paper Assignment

• Papers assignment – Lottery – 22 slots!!!
  • You get a number (put your name on the sheet)
  • We draw your number, you choose your paper
Topics

- Animation (2)
- Physically-based Simulation (2)
- Feature (1)
- Recognition (1)
- Modeling (2)
- Mocap (2)
- Localizers (2)
- Rendering (2)
- Displays (2)
- Dynamic Reconstruction (2)
- Segmentation (2)
- Geometry (2)
Static 3D Modeling

Piecewise Planar and Non-Planar Stereo for Urban Scene Reconstruction

*David Gallup - Jan-Michael Frahm - Marc Pollefeys*

*(UNC, ETH)*

*CVPR2010*
High-Quality Single-Shot Capture of Facial Geometry
Thabo Beeler - Bernd Bickel - Paul Beardsley - Bob Sumner - Markus Gross
SIGGRAPH 2010
Features

BRIEF: Binary Robust Independent Elementary Features

Michael Calonder - Vincent Lepetit - Pascal Fua
(EPFL)
ECCV 2010
Recognition

Discriminative Models for Multi-class Object Layout
Chaitanya Desai - Deva Ramanan - Charless Fowlkes
ICCV 2009 (Best Paper)
Dynamic Color Flow: A Motion-Adaptive Color Model for Object Segmentation in Video

XueBai - Jue Wang - Guillermo Sapiro
(Adobe, University of Minneapolis)
ECCV 2010
Gesture Controllers
Sergey Levine - Philipp Krahenbühl - Sebastian Thrun - Vladlen Koltun
SIGGRAPH 2010
iSAM: Incremental Smoothing and Mapping
Michael Kaess - AnanthRanganathan - Frank Dellaert
IEEE TRANSACTIONS ON ROBOTICS 2008
Probabilistic Temporal Inference on Reconstructed 3D Scenes

Grant Schindler - Frank Dellaert
CVPR 2010
Dynamic 3D Modeling

3D Reconstruction of a Moving Point from a Series of 2D Projections

Hyun Soo Park - Takaaki Shiratori - Iain Matthews - Yaser Sheikh

ECCV 2010
Consensus Skeleton for Non-rigid Space-time Registration
EUROGRAPHICS 2010
Combining Discriminative and Generative Methods for 3D Deformable Surface and Articulated Pose Reconstruction

Mathieu Salzmann – Raquel Urtasun

CVPR 2010
Real Time Motion Capture Using a Single Time-Of-Flight Camera
Varun Ganapathi - Christian Plagemann - Daphne Koller - Sebastian Thrun
CVPR 2010
Apparent Display Resolution Enhancement for Moving Images

P. Didyk, E. Eisemann, T. Ritschel, K. Myszkowski, H. Seidel

(MPI, Telecom ParisTech)

SIGGRAPH 2010
A Multi-Layered Display with Water Drops

Peter Barnum - Srinivasan Narasimhan - Takeo Kanade

SIGGRAPH 2010
Example-Based Facial Rigging

Hao Li - Thibaut Weise - Mark Pauly
SIGGRAPH 2010
Visibility Transition Planning for Dynamic Camera Control

Thomas Oskam - Robert W. Sumner - Nils Thuerey - Markus Gross
Symposium on Computer Animation 2009
LpCentroidalVoronoiTesselation and its Applications

Bruno Lévy and Yang Liu

SIGGRAPH 2010
Papers

Geodesic Patterns
Helmut Pottmann-Qixing Huang - Bailin Deng - Alexander Schiftner-Martin Kilian-Leonidas Guibas - Johannes Wallner
SIGGRAPH 2010
Stable Spaces for Real-time Clothing
Edilson de Aguiar - Leonid Sigal - Adrien Treuille - Jessica K. Hodgins
SIGGRAPH 2010
Unified Simulation of Elastic Rods, Shells, and Solids
Sebastian Martin - Peter Kaufmann - Mario Botsch - Eitan Grinspun - Markus Gross
SIGGRAPH 2010
Optical Computing for Fast Light Transport Analysis

Matthew P. O'Toole - Kiriakos N. Kutulakos
SIGGRAPH ASIA 2010
Scalable Fluid Simulation using Anisotropic Turbulence Particles
Tobias Pfaff - Nils Thürey - Jonathan Cohen - Sarah Tariq - Markus Gross
SIGGRAPH ASIA 2010
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2.5D Cartoon Models
Alec Rivers - Takeo Igarashi - Frédo Durand
SIGGRAPH 2010
Structure-based ASCII Art
Xuemiao Xu - Linling Zhang - Tien-Tsin Wong
SIGGRAPH 2010
Presentation Preliminaries

• You MUST present in the time-slot assigned to you
  • Time slots will be set next week
• Exceptions (notify us as soon as possible)
  • Medical problems (w/ Dr. note)
  • Military Service (NOW!!!)
• Other *Exceptional* Circumstances
Presentation Preliminaries

• One supervisor per paper:
  – Will help you with the preparations
  – Check talk a few days before
  – Discuss unclear points in the paper
  – List of supervisors will be available on the web

  – **Contact supervisor EARLY!!!**
Presentation Preliminaries

• Your responsibility:
  – Contact supervisors
    – If supervisor does not answer or conflict
      – CONTACT US EARLY!!!
  – Come early and test your laptop
    – Let us know if you need a laptop for your presentation
Presentation Preliminaries

• Talk duration: 30 minutes
  – Don’t exceed this limit
  – Use your time wisely
  – We recommend 20-30 slides
  – Most papers have web-sites with movies and videos
    – USE THEM!!
  – Discussion: 15min
Presentation Hints…

• Goal of your presentation
  • Impart knowledge to the audience
    (Not show off that you understood the paper)
  • Be critical/objective

• Preparation
  • Read the paper and **background material**
  • Think about potential visual aids, e.g., demos, videos, etc.
  • Make sure you understand the subject
  • Talk to assistant (or contact authors) if questions remain
Structure your talk

• Introduction
  – General context, problem statement
  – Motivation,
  – Contents of the paper
    – Core points of the paper, key contributions, relevant results,
  – Relation to other work
    – Explore similar papers (use bibliography)
  – Take home message
Structure your talk

• Discussion
  – Evaluate the paper from your own perspective
  – **Be critical**
  – Discuss advantages and disadvantages
  – Talk about impact and directions for future work
  – **Be prepared to answer questions**
    – Element of the evaluation
Transmitting the message

• Have a ‘path through your talk’
  • Important points as landmarks that you refer to
  • Put detail that you present into larger context

• Consider your audience
  • What prior knowledge can you expect?
  • Make sure people will be able to follow your presentation
  • Think of collecting people lost along the way
The Talk

• Practice your talk
  – get feedback from others or use video camera
  – check the timing

• Talk to the audience not to the screen

• Talk clearly, not too slow or too hasty

• Give the audience time to understand

• Reconnect to the audience
Things to avoid

- Exceed the time limit
- Never practice the talk
- Lose yourself and the audience in detailed, confusing explanations
- Too many slides, equations, too many bullets
- Fonts too small, too much text
- Discontinuous speech
- Ignore the audience
Participation

• 25% of the final grade
• Very important aspect:
  • Show us you read and understood the paper
  • Drives a critical discussion
• Presence mandatory (subtract points if you are missing the class)
• 0 – points if you attend
• 1 – 2 points if you ask questions
• 3 – points if you drive an interesting discussion
More Hints

Scientifically Speaking

http://www.erp.wisc.edu/profdev/Scientifically_speaking.pdf

How to give a great Siggraph talk

http://www.dgp.toronto.edu/~anab/grad/siggraphtalk01.pdf
Bachelor/Masters Thesis

http://graphics.ethz.ch/teaching/studentprojects/
Questions?

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Cengiz
cengizo@inf.ethz.ch

• For announcements we use your ETH address
• Make sure you check it weekly
3D Modeling with Silhouettes
Alec Rivers - Fredo Durand - Takeo Igarashi
SIGGRAPH 2010