Course goal

• Gain practical understanding of the contents covered by the accompanying lecture
• Special emphasis is on high-level vision
• This year: dynamic scene classification using several different datasets
• Particularly: “sceneness” – what characterizes a specific dynamic scene?
Course concept

• Students will be required to complete a computer vision project
• This project will allow students to gain “hands on” experience with a computer vision research topic
• Teamwork (2 students) involving analytic, programming and testing components
• The Projects will consist of three parts related to “sceneness” – what makes a scene distinctive?
Example: Dominant **video** object segmentation


Code available online at: [http://groups.inf.ed.ac.uk/calvin/FastVideoSegmentation/](http://groups.inf.ed.ac.uk/calvin/FastVideoSegmentation/)
Example: Estimating *image* objectness

“Objectness maps”

Alexe, B., Deselares, T. and Ferrari, V. “Measuring the objectness of image windows” PAMI 2012
Code and paper available online at: http://groups.inf.ed.ac.uk/calvin/objectness/
Example: Visualizing HOG image features

Code and paper available online at: http://web.mit.edu/vondrick/ihog/
Course concept

• The Projects will consist of three parts
  – (1) Dataset acquisition
    • Category selection (Due date: 13. October 2014)
    • Data acquisition (Due date: 25. November 2014)
      I. New classes
      II. Extension of YUPENN classes
  – (2) Project proposal for „sceneness“
    • Brief (1 page) proposal for project (Due date: 20. October 2014)
    • Hard- and software-platform can be chosen by the students
  – (3) Final demo
    • A final written report (approximately 5 pages)
    • Presentation of the Project, HS i8 (PZ2EG026)
      (Due date: 27. January 2015)
Grading

• Major components for grading
  – Clarity of reports and presentation (structure and discussion of the methodology, analysis, and experiments, correctness of results)

• Dataset acquisition: 30%
• Presentation: 30%
• Proposal report: 10%
• Final report: 30%
Project (1): Category selection

• The goal is to create a new dataset of dynamic scenes and extend an existing one (YUPENN)
• Each team will choose 4 particular categories of dynamic scenes and inform the instructor of their choice via a short email to feichtenkofer@tugraz.at
  Due date: 13 October 2014.
• The final category assignment is subject to the instructor's approval
• A list of possible categories (which should not be used) can be found in the two existing datasets on dynamic scenes.
  – Maryland “in-the-wild”: download
  – YUPENN Dynamic scenes: download
Maryland “in the wild” dataset

- avalanche
- boiling water
- chaotic traffic
- forest fire
- fountain
- iceberg collapse
- landslide
- smooth traffic
- tornado
- volcanic eruption
- waterfall
- waves
- whirlpool

- 13 scene categories
- 10 videos each
- Unconstrained camera motion
YUPENN dynamic scenes dataset

- 14 scene categories
- 30 videos in each category
- Stabilized camera
Project (1): Category selection

• The acquired dataset should have the same structure: http://www.cse.yorku.ca/vision/research/dynamic-scenes/
• Each team has to come up with 4 novel categories that can be acquired by them
• Do NOT use existing categories from the YUPENN dataset
• Make sure to be able of finding (internet or capture) 60 different instances (examples) of this class
• Category submission instructions
  – Mail your list of 4 categories to feichtenhofer@tugraz.at with title “IVS KU Project Report- [Your surnames]“. (Due date: 13. October 2014)
Project (1): Dataset acquisition

i. New classes

• Assignment of one category to each team
• Capture or download 70 videos of around 5 seconds duration for this category
  – All videos have to show different scenes
    a) 35 with camera motion (arbitrary, e.g., pan, zoom...)
    b) 35 with stationary camera
• Name files accordingly
  – [scene_category_motion_type_a_video_1...30]
  – [scene_category_motion_type_b_video_1...30]
• Recorded scene must have “defining dynamics”
Project (1): Dataset acquisition

ii. Extension of YUPENN classes

• Extension of YUPENN dataset
• Each team is assigned to 2 categories
• Inspect the videos of this category
• Collect (download from internet or capture) videos of 35 different instances/examples from that class, with camera motion!
  – Duration of each clip: 5 seconds
• These videos should not have too large intra-class differences to the existing videos in YUPENN
Project (2): Proposal

• Brief (1 page) proposal for project
  – Describing an approach (providing a plan of attack), including what problem analyses, implementations and testing you intend to perform
  – Hard- and software-platform can be chosen by the students

• Proposal submission instructions
  – Mail your project proposal to feichtenkofer@tugraz.at with title “IVU KU Project Proposal - [Your surnames]" in PDF format. (Due date: 20. October 2014)
Project (3): Final demo

• A final written report (approximately 5 pages) which documents the results of the team's investigations
• Further, each student will provide a demonstration/discussion of their project results in front of the class.
• The software program that results as part of the project must allow the instructor to test the program during the final demo.
• Final submission instructions
  – Mail your final report to feichtenhofer@tugraz.at with title “IVU KU Project Report- [Your surnames]" in PDF format. (Due date: 20. January 2014)
  – Mail your software program to feichtenhofer@tugraz.at with title “IVU KU Project Software- [Your surnames]" in PDF format. (Due date: 20. January 2014)
  – Mail your slides to feichtenhofer@tugraz.at with title “IVU KU Project Slides - [Your surnames]" in PDF format. (Due date: 27. January 2014)
In Summary: Course concept

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