43075-01 Probabilistic Shape Modelling

Lecturers
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Introduction	10. Mai 2022
Submission deadline	27. Mai 2022

Shape modelling project - Final submission

1. Preparation

- Work through exercise sheets 1 to 7.
- Work through weeks 1 -4 of the probabilistic fitting course.

2. Put together your solution

From exercise sheets 1 to 5 you should have obtained a statistical shape model of the femur, which is both qualitatively and quantitatively validated. From exercise sheet 7, you should now have a procedure to complete femur fragments. Finally, from the work done on exercise sheet 6, you should have a procedure to predict stature and sex for any femur.
Use these components to predict for each of the given femur fragments the sex and the stature. Think about the possible uncertainties that are introduced in each step of the solution and think about how they will affect the uncertainty of the final prediction. Try to quantify the uncertainty associated with your prediction.

3. Finalize the report

Finalize the report. Extend and adapt the method (and background) section such that it covers the necessary theory needed to understand your approach. Add your experiments and results and discuss them. In particular, the result section should contain a table with the predicted stature and sex for each femur fragment along with a measure of uncertainty. (Natureal measures of uncertainties are the standard deviation of your predictions for the stature and the class probabilities for the sex prediction).

The criteria that we use for grading the report are summarized at the end of this document.

4. Submission

Create a zip archive consisting of

- Your report (in .pdf format)
- For each femur fragment, the best completion that you obtained using your model (in .stl or .ply format)
- The source code (The source code is needed for reference only. It will not be graded).

Submit the Zip-Archive containing your project submission on Adam:
`https://adam.unibas.ch/goto_adam_exc_1401894.html`

A. Grading rubrik

The following criteria will be applied for the grading of your submission.

Quality of writing, Mechanics (20%)

- Are the goals of the project clearly and concisely summarized in the Abstract/Introduction?
- Is the report clearly structured and easy to read?
- Is the grammar okay? Are there typos? Is the typesetting appropriate?

Methods (20%)

- Are the methods adequately summarized and is the theory correct?
- Is everything that is needed to understand the text properly introduced?

Experiments (30%)

- Are the data and experiments adequately described (Is it possible to understand what was done)?
- Do the experiments make sense? Do they highlight relevant points?
- Are the experiments sufficient to gain insight into the method? Are there own experiments?

Results and Analysis (30%)

- Are the results of the experiments plausible? Are there obvious mistakes?
- How well does the method work?
- Are effective methods for visualization used to present the results?
- Are the results adequately analyzed and discussed? Are the right conclusion drawn?