

## Exercises for Multimedia Databases

### Sheet 8 (until 14.01.2010)

Please note that you need **50%** of all exercise points to be admitted for the final exams. Exercises have to be turned in until **Thursday** before the next lecture and should be completed in teams of two students each. Write both names and “Matrikelnummer” on each page. If you have multiple pages, staple them together! Please hand in your solutions on **paper** into the mailbox at the IFIS floor or to our secretary (Mühlenpfordtstraße 23, 2<sup>nd</sup> floor). You may answer in either German or English.

#### Exercise 1: Shot detection (5P)

- What is the general structure of a video? (1P)
- What are the issues with using the Template Matching technique for shot detection? (1P)
- What problem does Twin-Thresholding solve? (1P)
- How can we perform shot detection on compressed videos without decompressing them? (2P)

#### Exercise 2: Temporal models (15P)

- What are the problems that arise if we model the shot boundaries as a series of events through the Poisson process? (2P)
- In a very small training collection we have information about the duration of 15 shot:

|      |      |      |      |      |
|------|------|------|------|------|
| 2,94 | 2,91 | 3,83 | 5,57 | 7,53 |
| 3,98 | 3,78 | 3,19 | 3,63 | 2,87 |
| 5,86 | 4,88 | 2,75 | 1,25 | 4,29 |

Considering that the shot durations are Erlang-distributed, estimate the parameters  $r$  and  $\lambda$  of this distribution as described in the lecture. (13P)

**Note:** According to film theory,  $r$  is small. For this reason we shall consider it as taking values between 1 and 10, with a step of 1. To furthermore simplify the problem, consider that the continuous variable  $\lambda$ , varies between 0.01 and 10 with a step of 0.01.