

# Electronic passport and biometrics, winter 2006

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## 9. Exercise sheet

Hand in solutions until Tuesday, 23 January, 12<sup>15</sup>.

**Exercise 9.1** (Fingerprints).

(10 points)

Analyze your own fingerprints. As a basis consider the webpage <http://www.brazoria-county.com/sheriff/id/fingerprints/id-ncic.htm> and its subpages.<sup>1</sup>

- (i) Classify each of your fingers into one of the categories (acc.to FBI NCIC fingerprint classification): 3
- plain arch (AA),
  - tented arch (TT),
  - ulnar loop (01, ..., 49),
  - radial loop (51, ..., 99),
  - plain whorl (inner:PI, meeting:PM, outer:PO),
  - central pocket whorl (inner:CI, meeting:CM, outer:CO),
  - double loop whorl (inner:DI, meeting:DM, outer:DO),
  - accidental whorl (inner:X1, meeting:XM, outer:XO),
  - missing (XX), scarred or mutilated (SR), unable to classify (UC).

Start with your right thumb through to your right little finger and then continue from your left thumb to your left index finger.

My pattern is something like: 11 TT 03 04 03 05 55 TT 04 06.

Compare your pattern with the average values for arches (5%), loops (65%) and whorls (30%). 1

(In the tutorial we'll put together all our findings.)

- (ii) Give a (very) brief description (in your own words) for each of the preceding classes. [Consider number of deltas, or describe them as "looking like a combination of"... , or think of a question like what would be a loop with 0 ridges between delta and core?] 4
- (iii) How can Henry classifications be transformed into NCIC classifications? 2

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<sup>1</sup>Or one of these: [http://www.virtualsciencefair.org/2004/fren4j0/public\\_html/fingerprint\\_patterns.htm](http://www.virtualsciencefair.org/2004/fren4j0/public_html/fingerprint_patterns.htm), <http://www.fbi.gov/hq/cjisd/takingfps.html>, <http://www.bergen.org/EST/Year5/fingerprint.htm>. The links are also on our course webpage.

**Exercise 9.2** (More about large scale automation).

(3+2 points)

Read the FBI pages about IAFIS.

- 1 (i) How large is the archive now?
- +1 (ii) How many requests per day are made? Or:
- 1 (iii) How is the archive accessed?
- +1 (iv) How reliable is the system? What are the false accept and reject rates? (Name a source for these rates, please, if you find that.)
- 1 (v) How long does a single search take? (CPU? turn around time?)

For finding your luck or destiny you might want to compare the webpage <http://www.handanalysis.net/>.