

Esecurity: secure internet & e-passports,
summer 2014
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13. Exercise sheet

Hand in solutions until Monday, 14 July 2014, 13:00

Exercise 13.1 (Fingerprints). (12 points)

Analyze your own fingerprints.

- (i) Classify each of your fingers according to the FBI NCIC fingerprint classification into one of the categories: 5
- 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. [Hints: The page http://ridgesandfurrows.homestead.com/fingerprint_patterns.html may help you. In case of doubt, there is an FBI fingerprint training manual available at http://www.nlada.org/forensics/for_lib/Documents/1134062047.83/document_info.]

My pattern is something like: 11 TT 03 04 03 05 55 TT 04 06, ie. eight loops and two tented arches.

- (ii) Compare your pattern with the average values for arches (5%), loops 3
(65%) and whorls (30%).
(In the tutorial we'll put together all our findings.)
- (iii) Give a 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

Exercise 13.2 (Historical Development).

(0+8 points)

Pick a country of your choice – other than the U.S. – who maintains an electronic database for fingerprints. Answer the following questions citing appropriate sources.

- +2 (i) Since when are fingerprints recorded digitally?
- +2 (ii) Which system was used to classify them originally? – Which system is used now?
- +2 (iii) Who is recorded in the database?
- +2 (iv) Who has access to the database?

Exercise 13.3 (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?)

Exercise 13.4 (What to ask.).

(4+6 points)

- 4+6 Think about what you have learned during the semester. Formulate and answer at least one appropriate exam exercise.