RDW

THE FIGHT AGAINST PHOTO FRAUD

A study on the fraudulent morphing-technique in the driving license application process

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1 Problem context

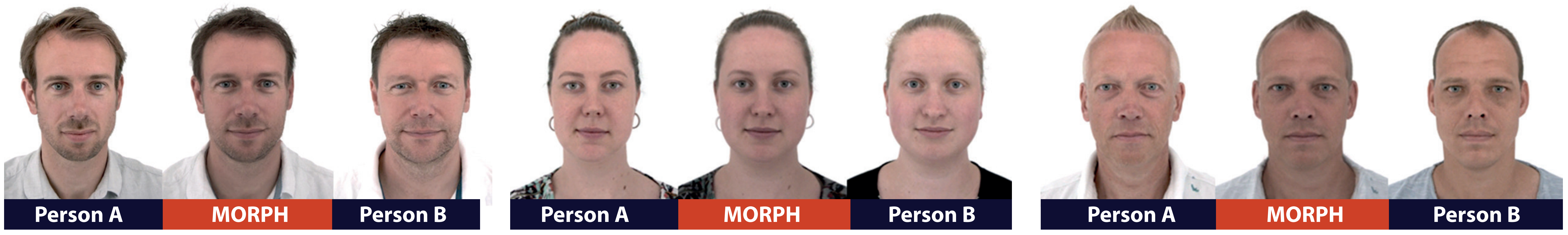
Morphing is a technique in photo shopping which fuses two faces into one. Consequently, morphing is an excellent method to acquire a driving license in name of someone else.
To investigate this phenomenon, commissioned by the RDW Dienst Wegverkeer the following questions have been answered: **'How to create a morph and how to assess the risks resulting from the use of morphed driving license?'**

2 Software selection

Comparing and testing different software, **Morph Age** was chosen to create morphs.

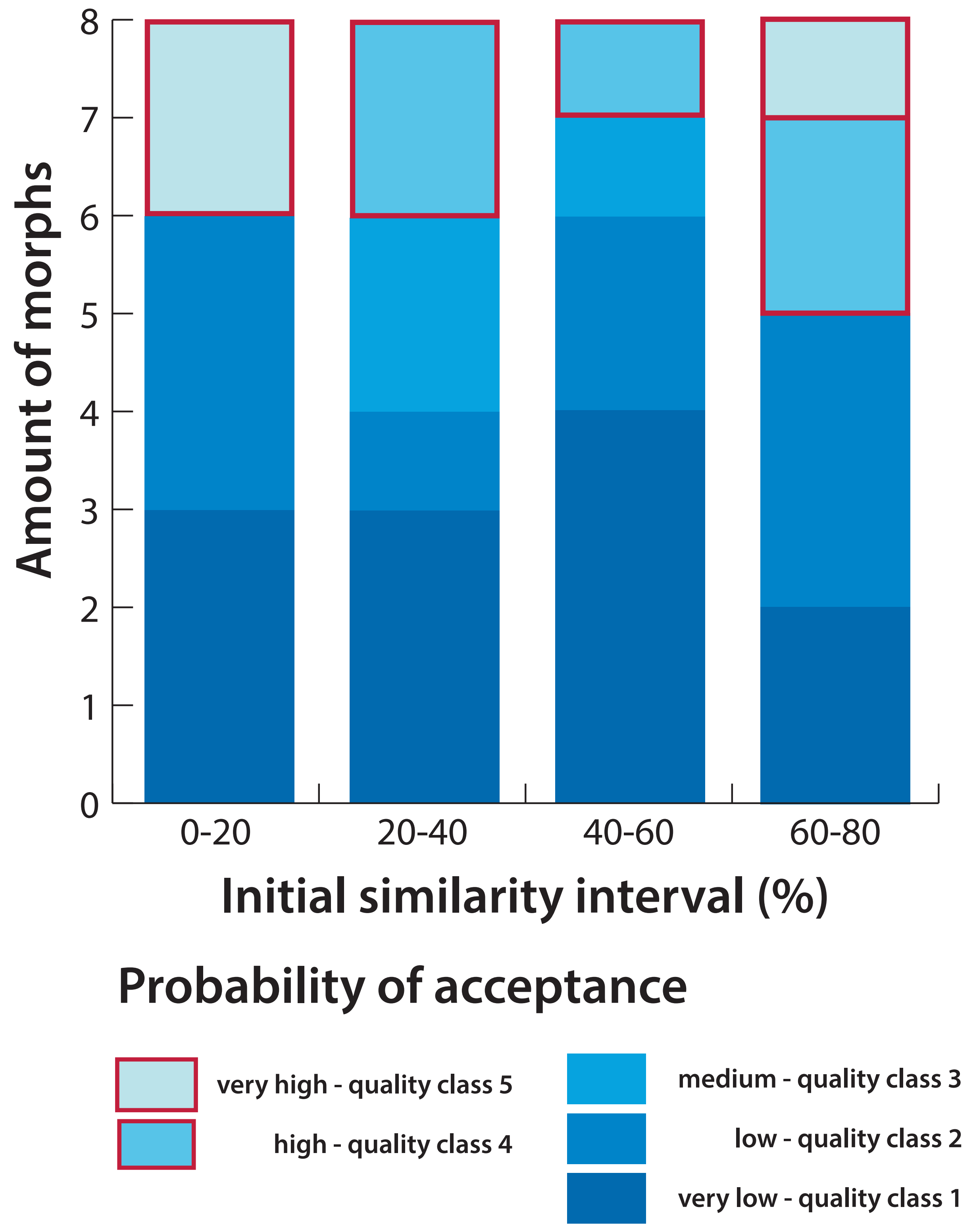
3 Creation of morphs

Photos of volunteers were compared by a matching tool to determine similarity (%). Thereafter, different combinations of people were morphed. Morphing took on average 22.5 minutes.



4 Morph classification

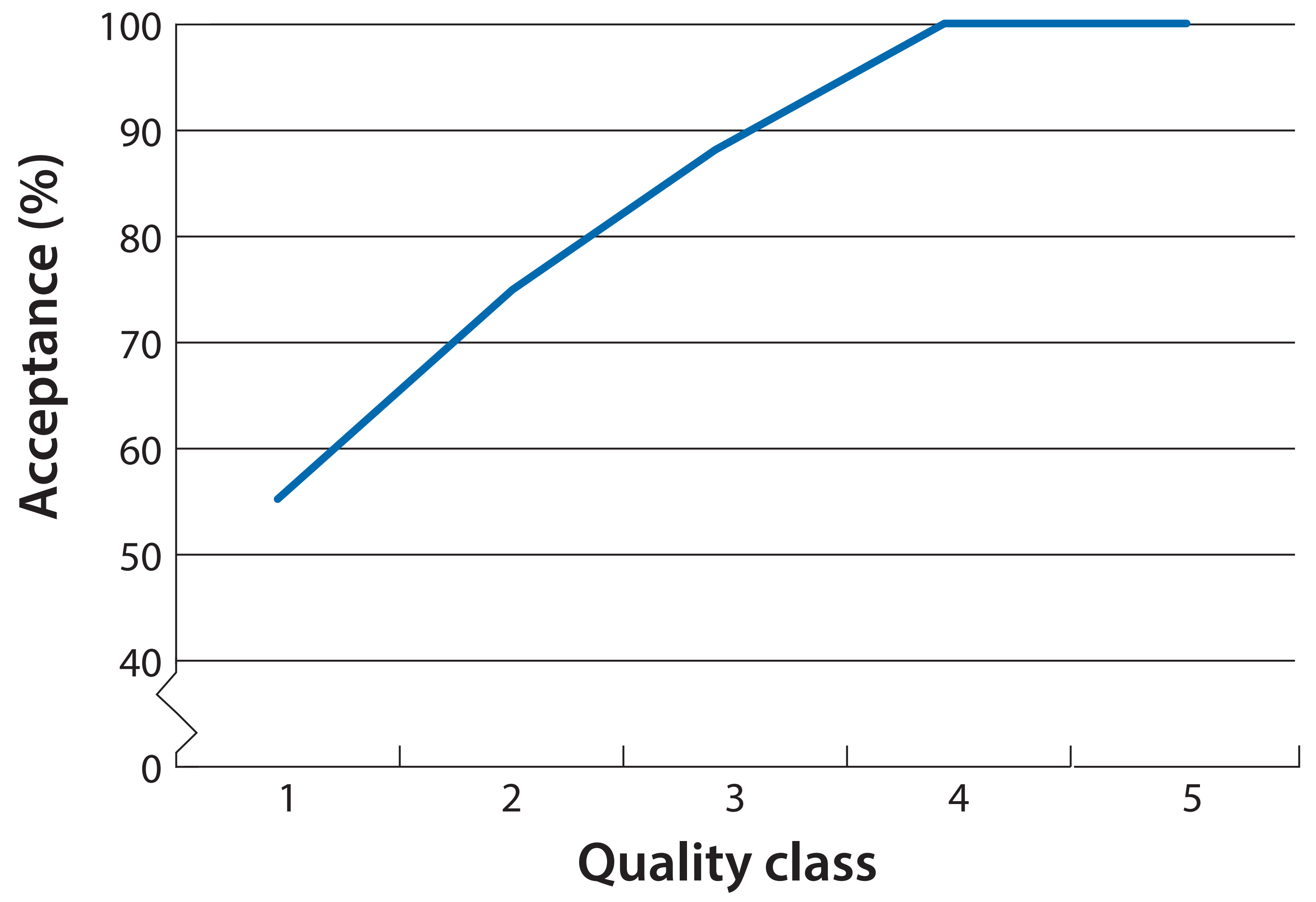
Correlation similarity (%) and probability of acceptance according to experts



5 Test morph recognition

A Town Hall simulation was set up to test the acceptance of morphs on driving licenses. A trend could be determined. **The better the morph, the higher the chance of acceptance.**

Acceptance of morphs by Town Hall (simulation)



6 Investigate application fields

What can be achieved using morphed driving licenses? There are many examples of possible fraudulent activities. Several application fields and examples were thought of. An example is driving a car without permission and causing an accident.

7 Risk assesment

A qualitative risk analysis was performed on different examples. The example about driving a car resulted in:

Chance x Impact = Risk
4 x 4 = 16 -> high

However, to quantify this risk into a more usefull number (damage), the risk analysis was translated based on the FMEA formula [1].
The result was:

Damage in euros=(1-D)xOxS
1-D = Chance of acquiring morph on driving license (No detection)
O = Chance criminal executes criminal action (Occurence)
S = Impact of this action (Severity)

Using this formula for the example:
1 x 0,705 x 125.000 = 84.600 euros

8 Conclusions

Even though morphing is easy and a morphed driving license can relatively easily be acquired, for most purposes many more is needed than just a driving license, and mostly easier alternatives to achieve the same goal are available. Therefore, the overall risk resulting from morphing can be considered low. Nevertheless, in case risks still need to be assessed in terms of damage/euros, the formula **Damage in euros=(1-D)xOxS** can be used.

9 Further research

Even though the risk can be considered low, the RDW still strives to detect all possible fraudulent applications. Therefore, they still try to find technical and process-based countermeasures. During this research a start of a possible technical countermeasure was made: 1:N comparison, which compares all applied photos with all photos in the database. Two hits of high similarity? The photo might be a morph.

References:
[1] Silva, M. M., Gusmão, A. P., Poleto, T., Silva, L. C., & Costa, A. P. (2014). A multidimensional approach to information security risk management using FMEA and fuzzy theory. International Journal of Information Management, 34(6), 733-740. doi:10.1016/j.ijinfomgt.2014.07.005