

Open questions in the current thesis

1. are there other features in the images that we can use?
2. how much do print settings / substrate / resolution / image content / printer driver influence the performance? Are there unwanted features that lead to good performance?
3. how well do deep learning methods work?

Possible approaches:

1. feature extraction was based on wavelet transform. The question is whether there are other features (droplet size, print pattern, grid, distance of the dots and so on) in the images that can be used for classification?
2. it is not known how the current model performs with additional data like different substrates (plain paper, photo paper) and print quality (standard, high), because for the current model only standard quality photo paper was used
3. investigate approaches with CNN, ANN, Resnet50

Hypothesize (should be examined and answered in this work)

- Factors such as different substrates and print settings lead to worse performance of the current model
- Extended feature extraction (based on droplet size, printing grid) is possible and leads to further improvement
- Invariance with respect to paper can be learned (droplet size and shape are different than on normal paper) (In the current work, rotation invariance could be learned: Random rotation around -10° and $+10^\circ$).
- Different print quality does not change the print grid. Standard and high quality are treated the same by the model
- With Deep Learning even better results are achieved, especially for real data