Document Analysis

Exercise 3 : Keyword Spotting / Week 2

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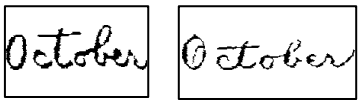
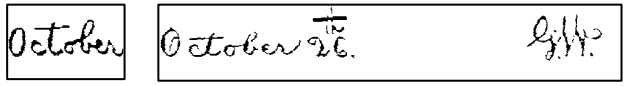
Outline of the Exercise

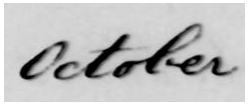
- Week 1
  - Dissimilarity between preprocessed keyword images and preprocessed word images
  - Output: ordered list of words IDs

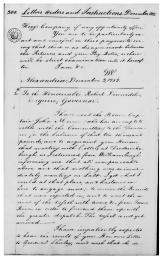


- **Week 2**
  - Dissimilarity between preprocessed keyword images and preprocessed text line images
  - Output: ordered list of text line IDs



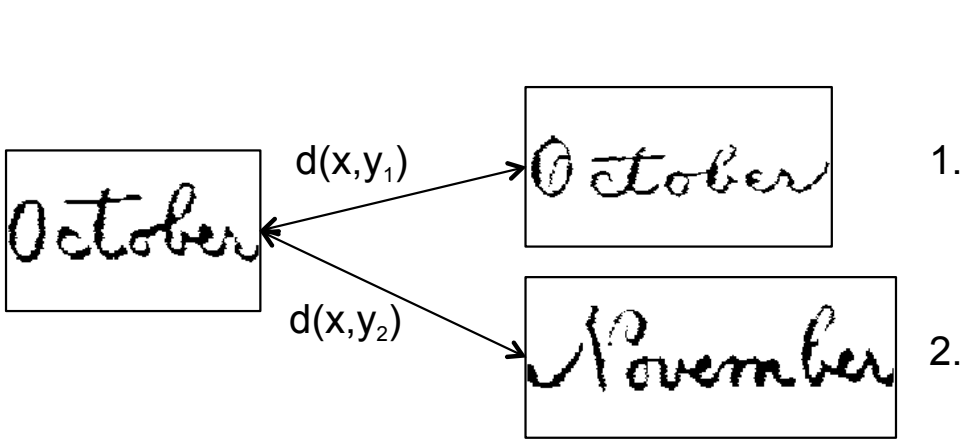
- Week 3 (ambitious - it is **optional**)
  - Dissimilarity between keyword images and automatically extracted text line images
  - Output:
    - List of text lines together with their bounding box
    - Ordered list of text line IDs

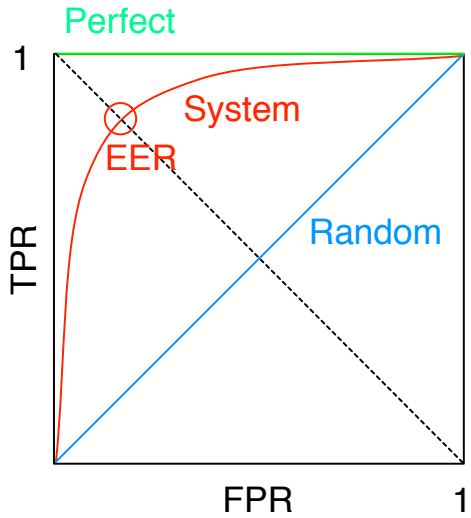




Week 1

- Tasks: for **both data sets** and **each keyword image**
  - Compute a dissimilarity to all word images and order the word images accordingly
  - Compute the Receiver Operating Characteristic (ROC) Curve and the Equal Error Rate (EER)
- Feedback from groups
  - Which **methods** did you work on?
  - What **problems** did you encounter?
  - Do you already have **results**? Are they promising?





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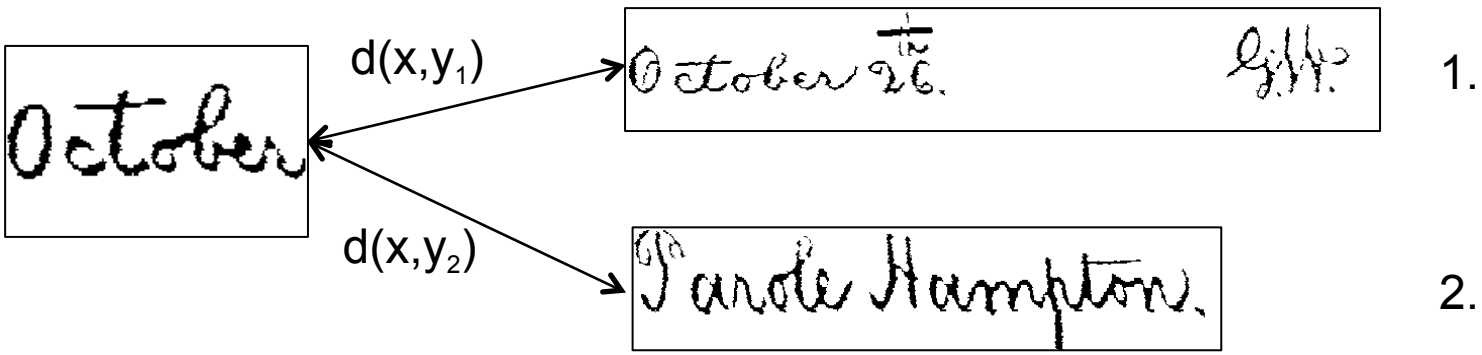
Week 2

- Data: available for download on Ilias
  - Preprocessed keyword images (same as in week 1)
  - Preprocessed text line images
  - Transcription for each text line image (ground truth)
- Tasks: for **both data sets** and **each keyword image**
  - Compute a dissimilarity to all text line images and order the text lines accordingly
  - Compute the ROC Curve, the EER, the Recall-Precision Curve, and the Avarage Precision (AP)



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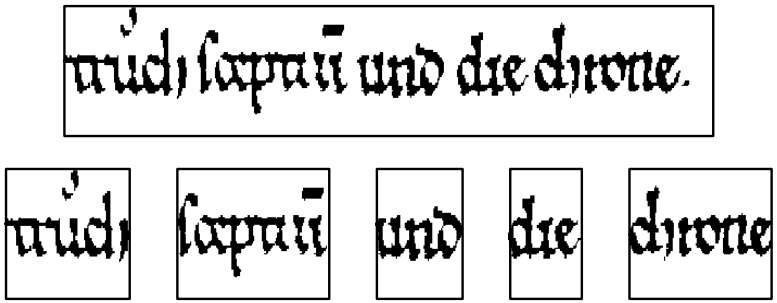
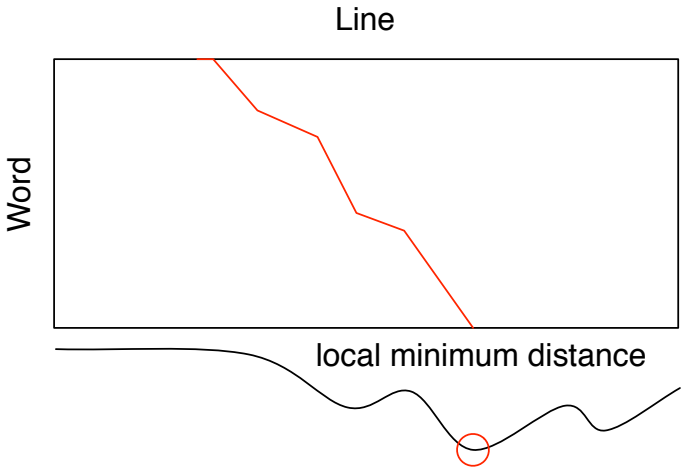
Exemplary Text Line Approaches

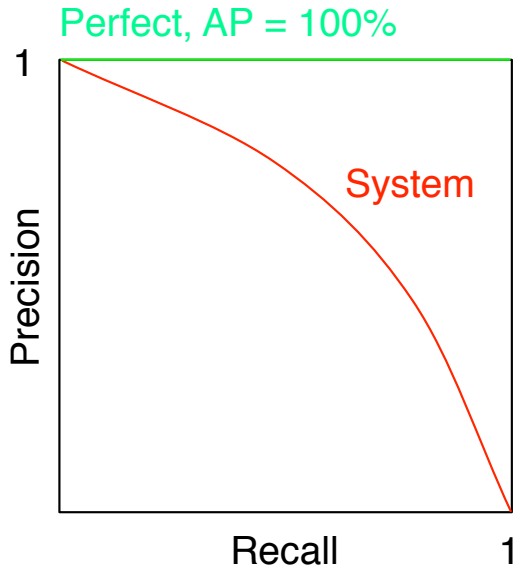
- Global and Grid-based: segment text line images into words, for example based on whitespace analysis.
- Window-based: DTW can be extended to the whole line, find local minimum in the line distance function.





Recall-Precision

- Same as for ROC: consider all possible thresholds for keyword spotting. First, only the top result is returned as a keyword. Then, the top two results, the top three results, etc.
- For each threshold, compute the True Positives (TP), False Positives (FP), and False Negatives (FN)
  - Recall = TP / (TP + FN) = True Positive Rate (TPR)
  - Precision = TP / (TP + FP)
- The Average Precision (AP) is the area under the Recall-Precision curve



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Output Week 2

- Ordered list of text line IDs for each database and keyword:

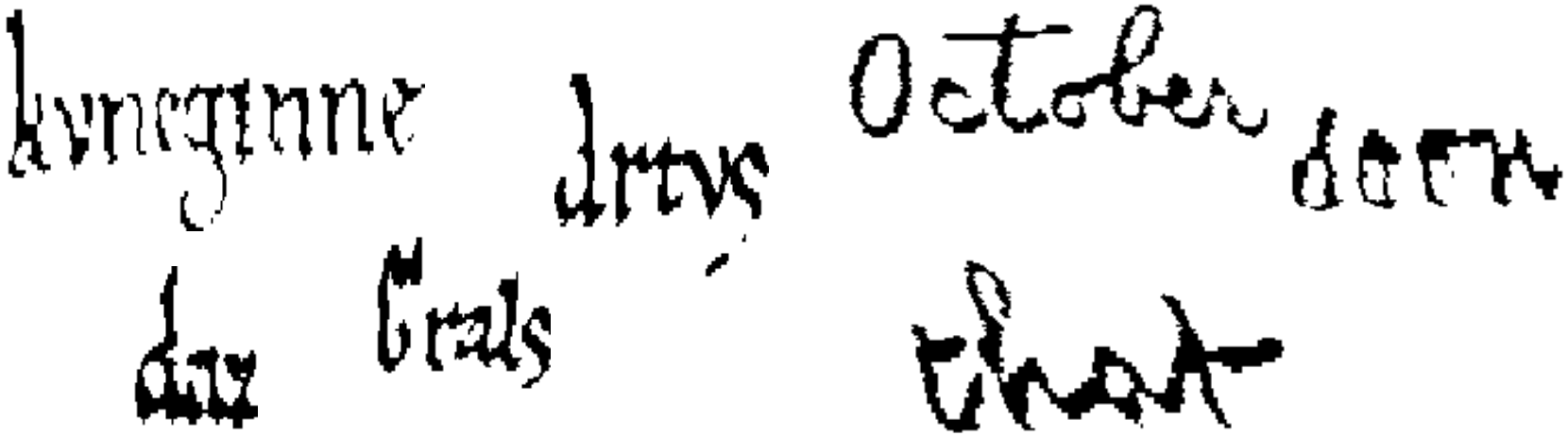
  “WashingtonDB_O-c-t-o-b-e-r.txt”

  271-11

  304-29

  …

- ROC, EER, Recall-Precision, and AP are part of the report.



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