



Wordspotting (segmentierungsfrei) mit einem patchbasierten Ansatz

Frederik Heerde, Ben Wilkes, Steven Brodziak, Berat Özdemir, Maximilian Brand

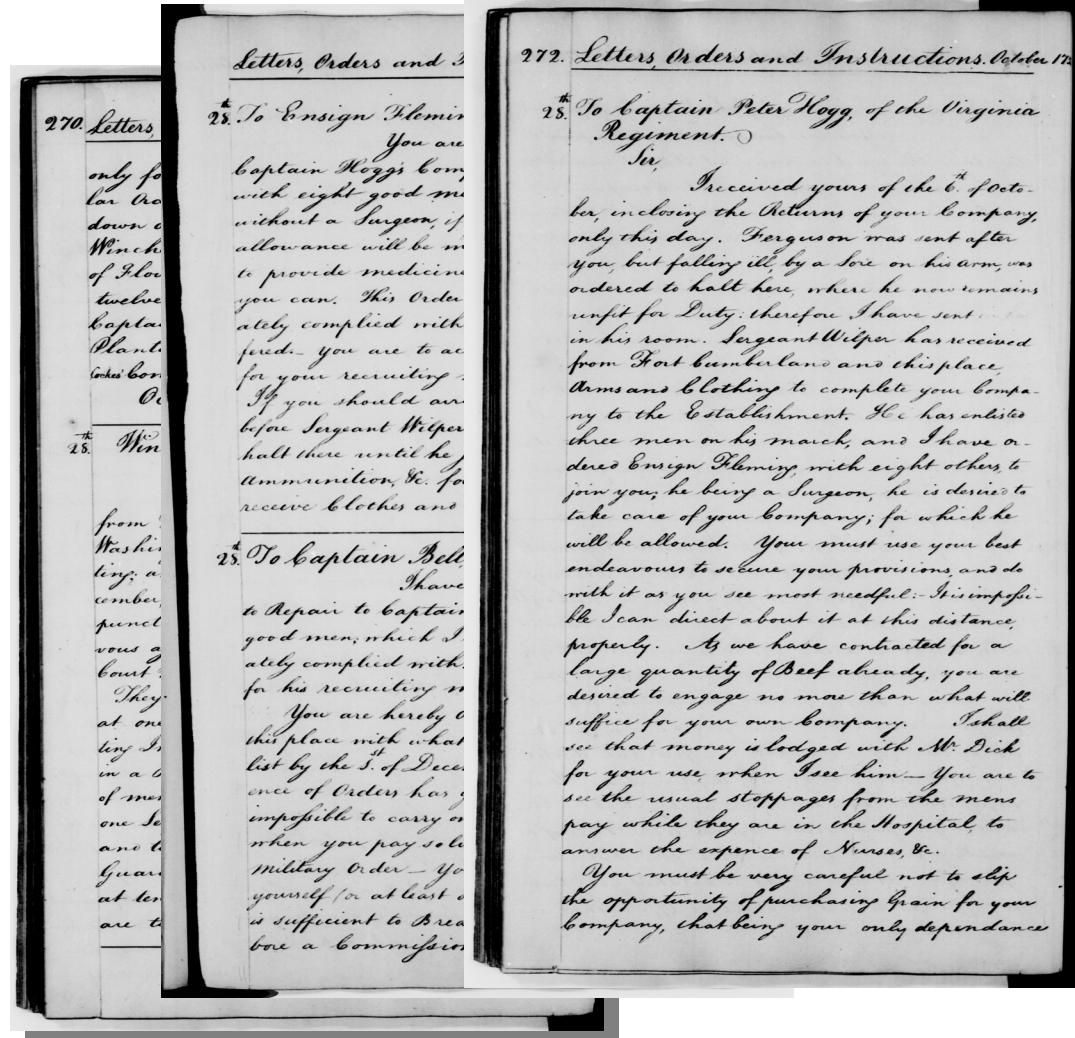
Unser Problem

Letters,

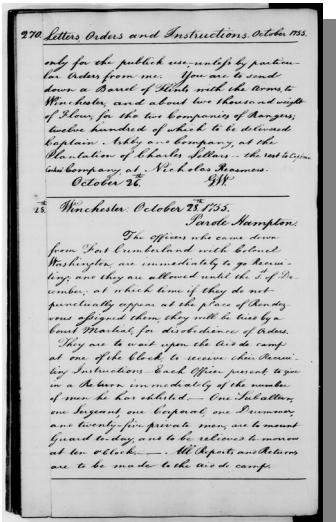
Suchen in:



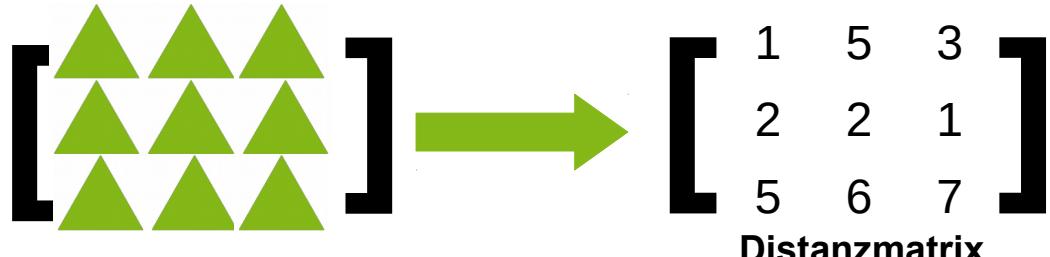
- **Query: Bildausschnitt aus einem Dokument**
- **Ziel: Alle Vorkommen des Querys finden**
- **Patchbasiert**



Unser Vorgehen

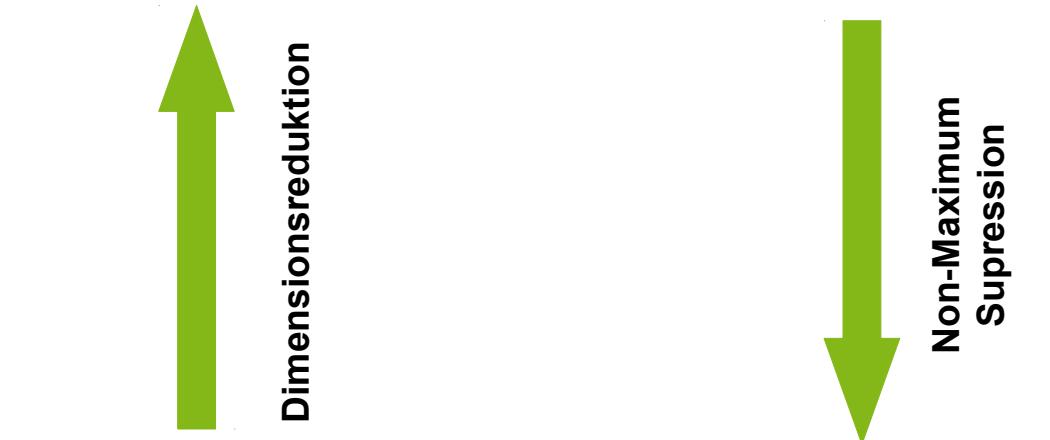


Document Level



Distanzmatrix

Dimensionsreduktion

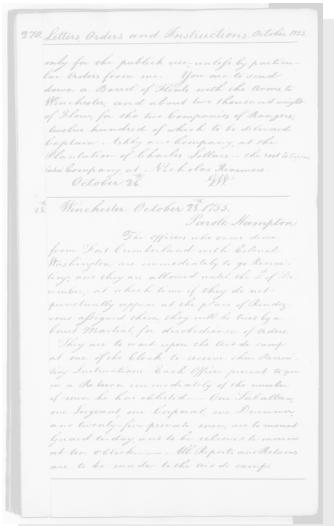


SIFT



Spatial Pyramid

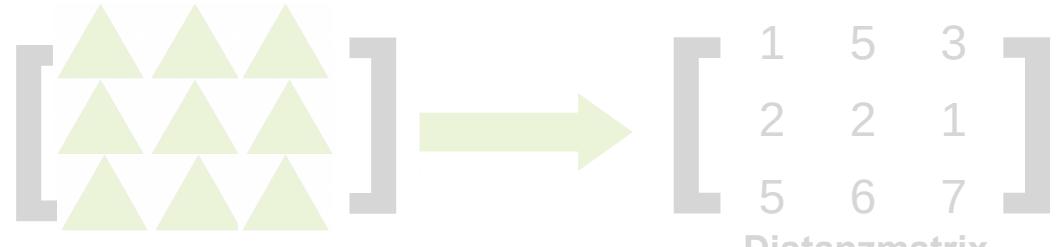
Unser Vorgehen



Document Level



SIFT

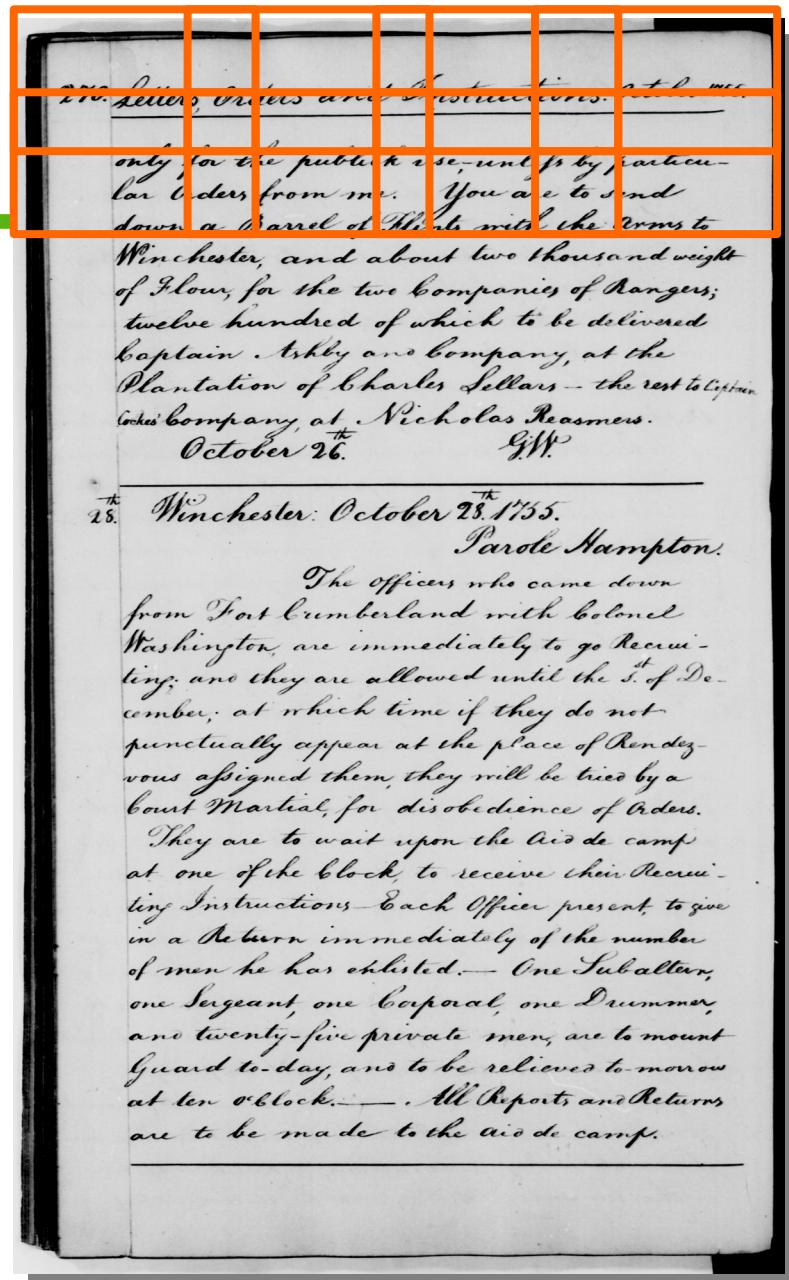


Distanzmatrix



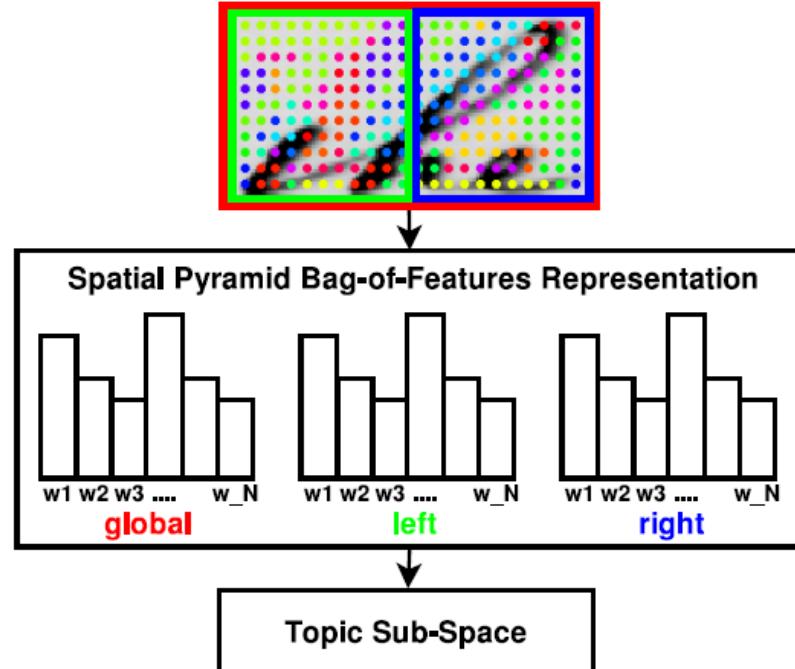
Patches extrahieren

- Einteilung des Bildes in Bereiche
- Überlappung
- Dynamische Patchbreite nach Querybreite
- Patches beinhalten zu Visual Words quantisierte Sift Diskreptoren



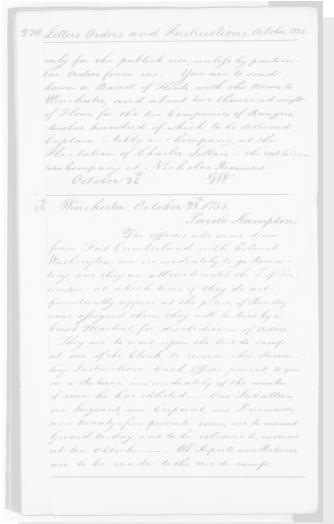
Spatial Pyramid Berechnung

- Drei Histogramme
 - Gesamter Ausschnitt
 - Linker Ausschnitt
 - Rechter Ausschnitt
- Gesamte Spatial Pyramid aus den Histogrammen konkateniert.
- Histogrammgröße: Größe des Codebooks
- Gesamtgröße: $3 \times$ Größe des Codebooks



Rothacker, Leonard; Fink, Gernot: „Dokumentenanalyse 2016“, unter: <http://patrec.cs.tu-dortmund.de/lectures/SS16/dokumentenanalyse/document-analysis.pdf> (abgerufen am 05.07.2016)

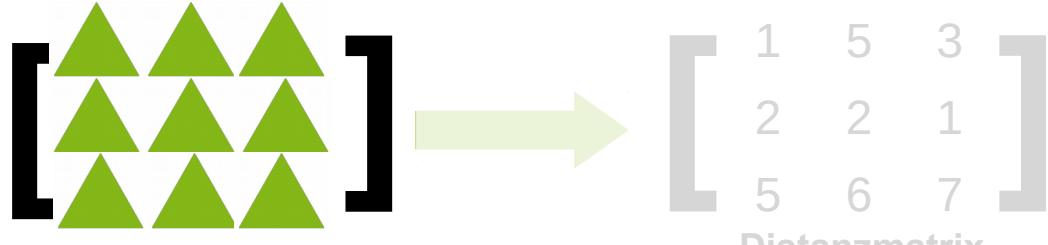
Unser Vorgehen



Document Level

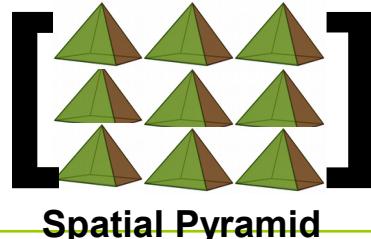


SIFT



Distanzmatrix

Dimensionsreduktion

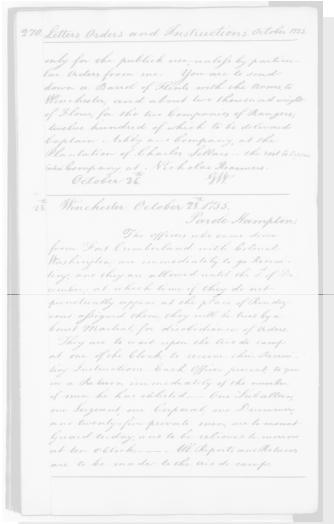


Non-Maximum
Suppression

Dimensionsreduktion

- Latent Semantic Indexing
 - Reduziert Anzahl der Dimensionen
 - Erleichtert Distanzberechnung im nächsten Schritt
 - Topic Feature Transform
-
- Query muss in den gleichen Unterraum transformiert werden

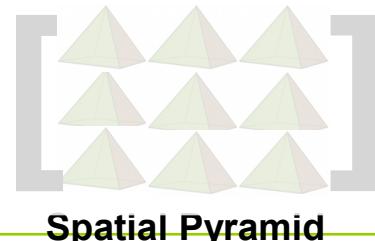
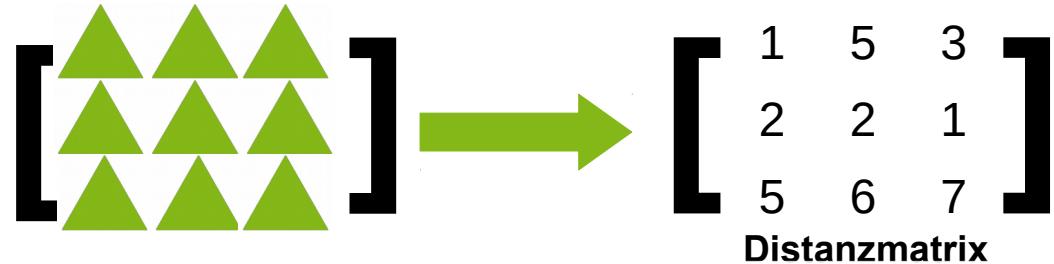
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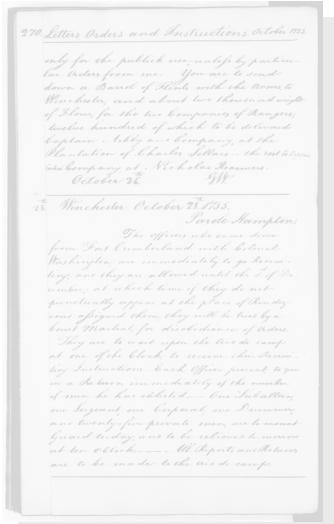
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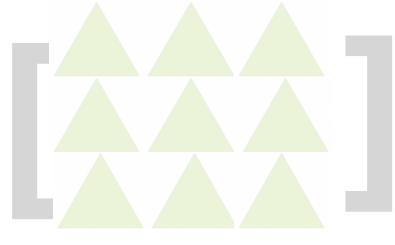
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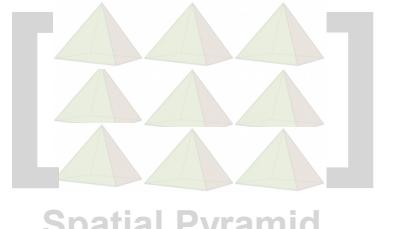
SIFT



1	5	3	
2	2	1	
5	6	7	

Distanzmatrix

Dimensionsreduktion

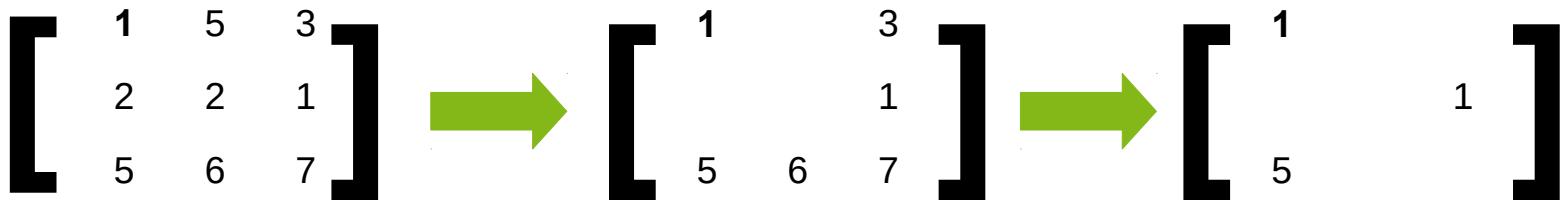


Non-Maximum Suppression

1	
5	1

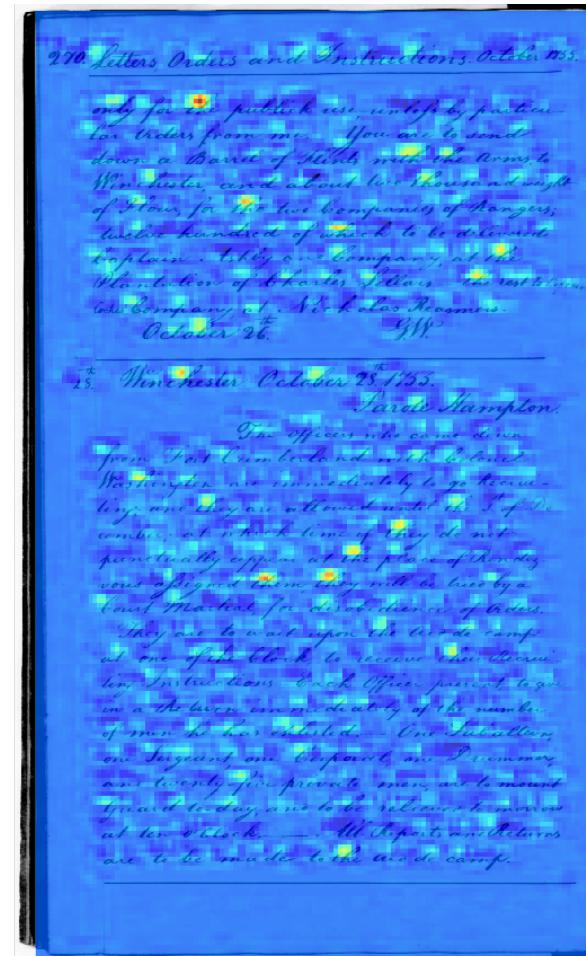
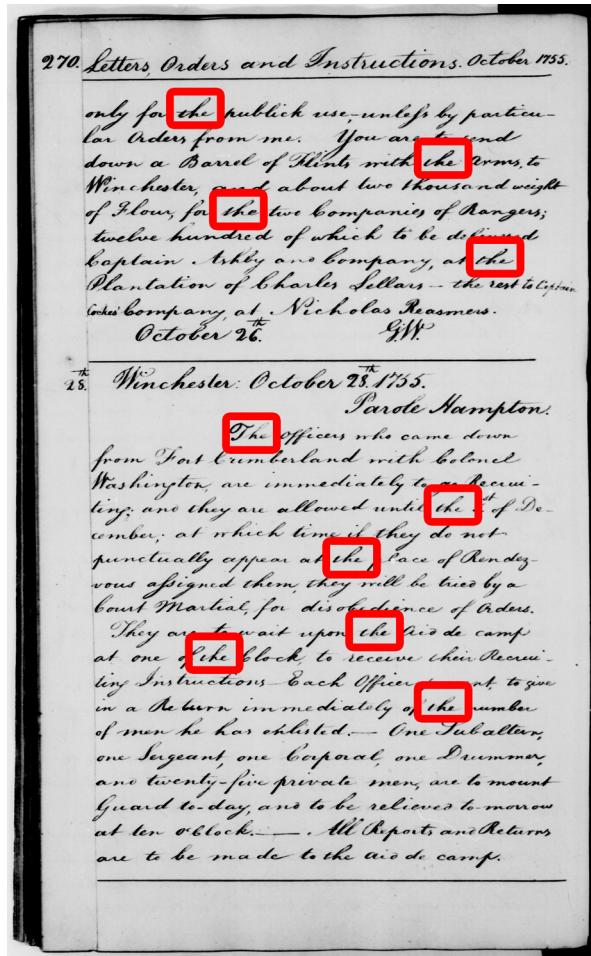
Non-Maximum Suppression

- Patches überlappen sich
- Durch Non-Maximum Suppression wird das beste Patch genutzt

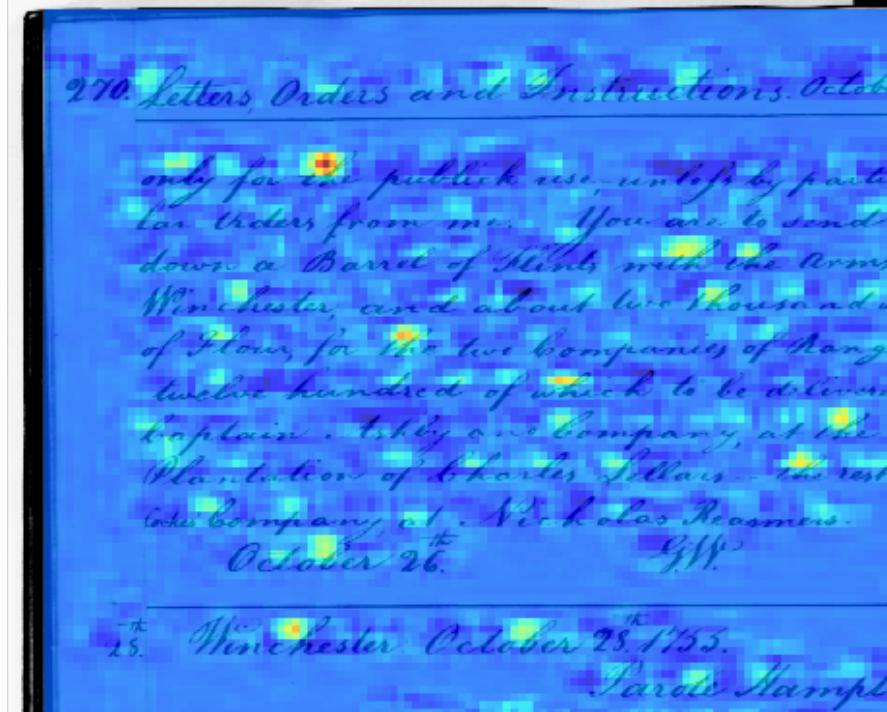
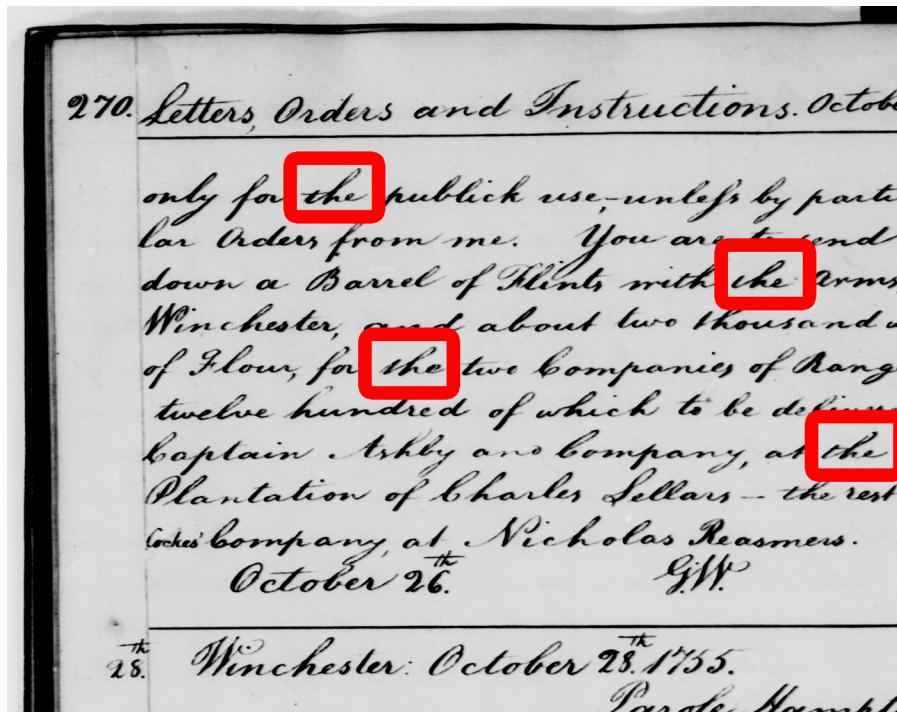


- Danach: Patches nach Distanz sortieren und ausgeben

Vorkommen von „the‘ auf Seite 1

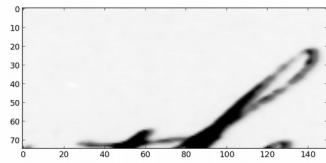


Vorkommen von ‚the‘ auf Seite 1

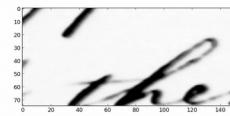


Ergebnisse

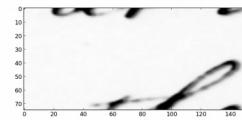
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2.



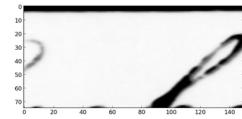
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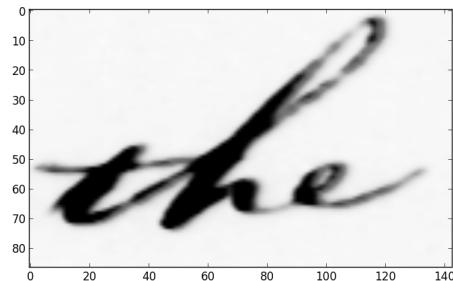
4.



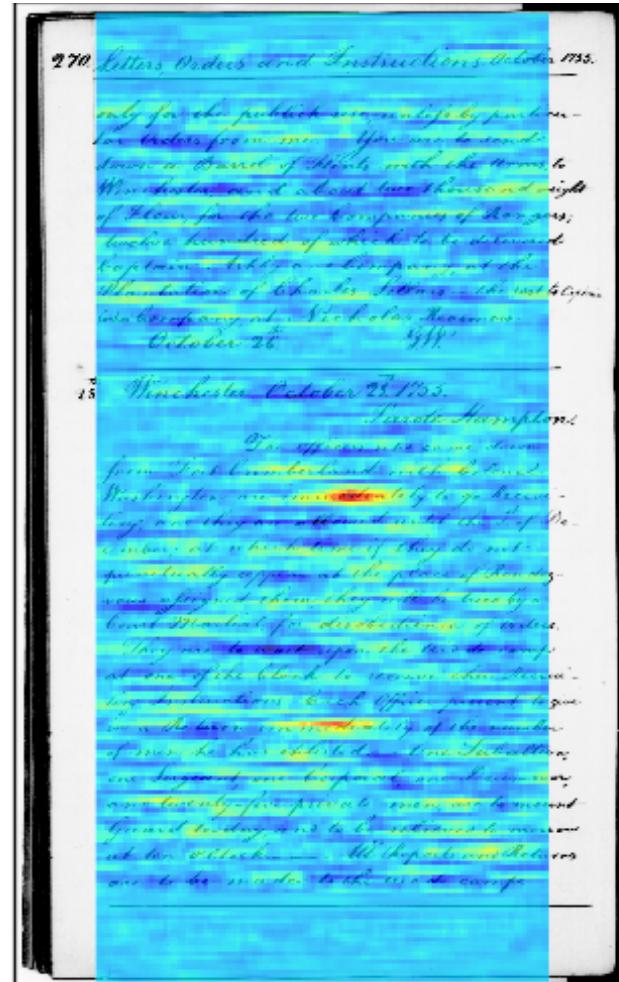
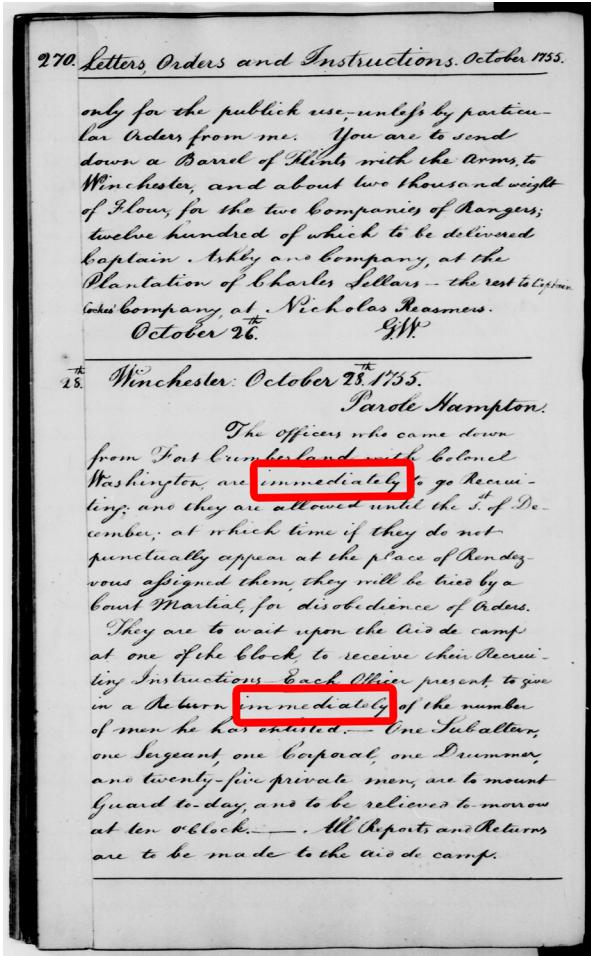
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Eingabe Query

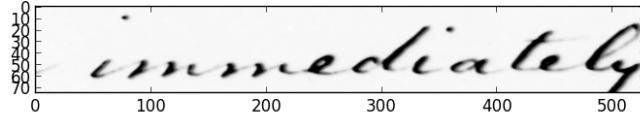


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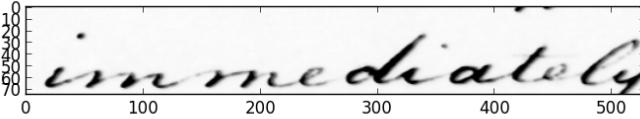


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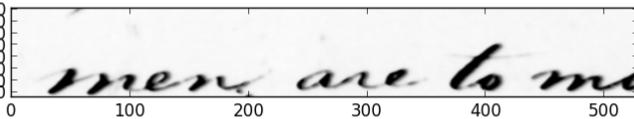
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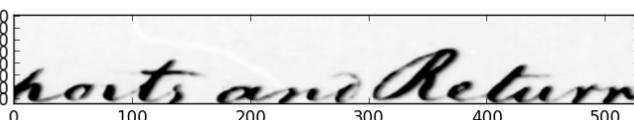
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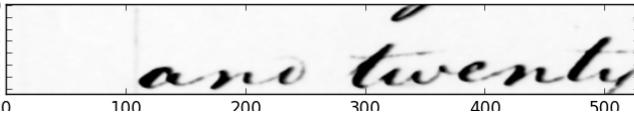
3.



4.



5.



Eingabe Query

