# Digital contributions to a 300 years old methodology: Diplomatics & DH

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Diplomatics = the search for characteristic features of groups of charters, information on their historical context, and for a certain chancery practice ("Kanzleimäßigkeit")

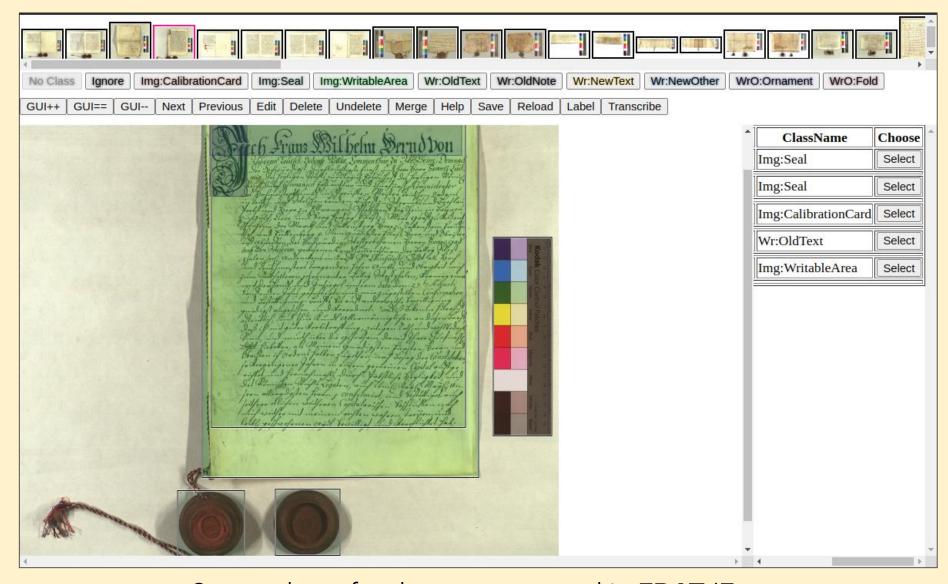
### The problem:

- number of 14<sup>th</sup> and 15<sup>th</sup> century documents in Central and Southern Europe is beyond the capacity of a single researcher: e.g. **Monasterium.net** contains over 600,000 charters from all over Europe (majorly Germany, Italy, Austria, Slovakia, Czech Republic, Hungary)
- Manual detection of charter features for datasets this large is not possible!

**CURRENTLY ONLINE** 

231 Archives 1983 Fonds 197 collections 663429 charters 925271 images

Screenshot from Monasterium.net as of May 28th 2023



Screenshot of a charter annotated in **FRAT** (**F**ast **R**ectangle **A**nnotation **T**ool)

## Computer vision approaches for diplomatics:

- round truth of a random selection of 1000 charters from the Monasterium.net corpus
- reformulating layout analysis as an **object detection problem** instead of the typical image segmentation approach
- defined a group of visual elements of charters in 11 different classes of interest in our future studies: "Seal", "Writable Area", "Ornament", "Old Text", "Old Note", "New Text", "New Other", "Fold" (i.e. Plica), "Calibration Card", "No Class" and "Ignore"

#### **Preliminary results:**

We annotated 1000 charters with all these 11 classes within 40 hours and trained an object detection model with similar bounding box regressors:

✓ between 97% and 70% accuracy depending on the class at a 50% intersection over union (IoU) threshold



Object detection and other computational methods may revolutionize the study of late medieval charters!

#### possible concrete research questions:

? influences of public notaries on the authentication of charters in the late Middle Ages (Weileder 2019)

? spread of humanistic charter script in the European context and an analysis of the humanistic networks behind it (Luger 2016)

#### References:

Luger, Daniel. *Humanismus und Humanistische Schrift in der Kanzlei Kaiser Friedrichs III. (1440-1493)*. Vol. 60. MIÖG Erg. Bd. Wien u.a.: Böhlau, 2016.

Weileder, Magdalena. Spätmittelalterliche Notarsurkunden: Prokuratorien, beglaubigte Abschriften und Delegatenurkunden aus bayerischen und österreichischen Beständen. Vol. 18. Archiv für Diplomatik. Beiheft. Köln, Wien: Böhlau, 2019.













