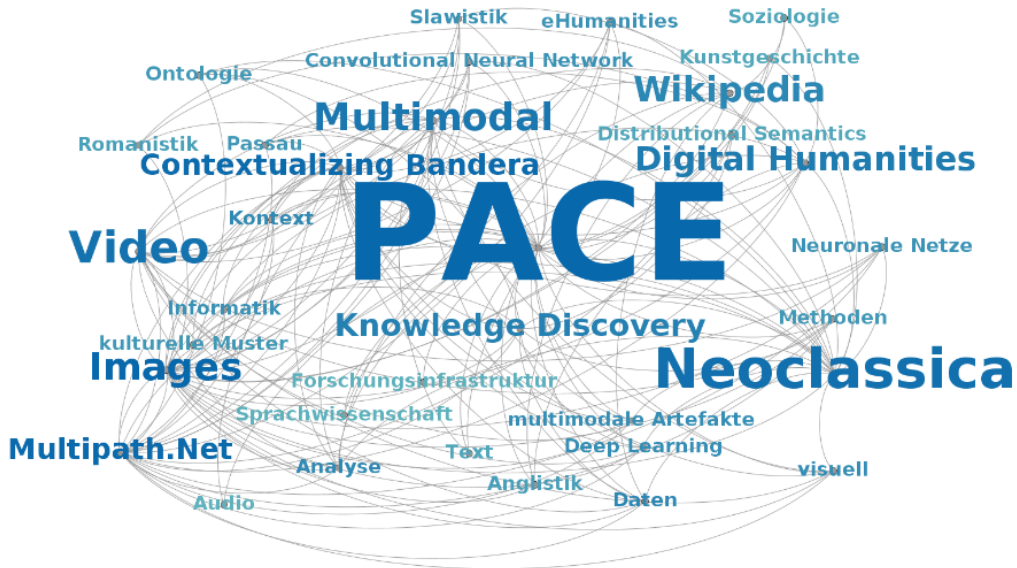


# Reading Symbolical Context in Youtube Videos

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1. Corpus
2. Methods
3. Evaluation
4. Results



# Corpus

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## Stepan Bandera (1909–1959)




# Corpus (2013, 2015, 2018)


 

степан бандера

Q


Hochladen






Filter ▾


Etwa 12.500 Ergebnisse



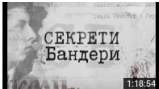
**Степан Бандера. Рассекреченная жизнь**  
von Clip4ok  
vor 2 Jahren • 522.097 Aufrufe  
Западная Украина живет своей собственной исторической памятью - музеи Степана Бандеры, памятники ему и...




**Степан Бандера: Украина между красным и черным. 2015**  
von Robinson.TV • интернет-телевидение • Харьков • всё включено :)  
vor 8 Monaten • 170.573 Aufrufe  
Копирование будет пресекаться страйками! Жанр кино  
ИСТОРИЧЕСКОЕ РАССЛЕДОВАНИЕ стал возможен только сейчас...



**Степан Бандера. Рассекреченная жизнь\*. Фильм Леонида Млечина. (1-я часть)\_2010**  
von Николай Коваль  
vor 2 Jahren • 822.381 Aufrufe



**Секреты Бандеры. Частина - 1**  
von Телеканал 1+1  
vor 9 Monaten • 134.284 Aufrufe  
Документальный фильм виробництва каналу "1+1", який розкриває таємниці життя українського політичного діяча,...

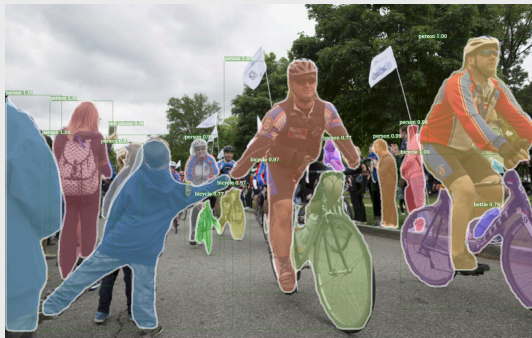


**Бандера  
разоблачение мифов**  
von hrendyabliki  
vor 8 Monaten • 464.464 Aufrufe  
<http://www.hrendyabliki.com/> По старой НКВД-шной памяти - Степан

## Methods

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# Detectron



- **Regional Convolutional Neural Network**
- *MaskRCNN* (He, Gkioxari et al. 2017) as *Regions-of-Interest* localisator
- *ResNet101* (He, Zhang et al. 2015) for feature extraction

(Girshik et al. 2018)



# Symbols

<i>Ukrainian nationalist symbols</i>	<i>German fascist symbols</i>	<i>Polish nationalist symbols</i>	<i>Russian / Soviet nationalist symbols</i>
Ukrainian coat of arms (208) 	SS-Rune (106) 	Polish coat of arms (38) 	Hammer & Sickle (111) 
Logo of Swoboda (129) 	Swastika (187) 	Falanga (91) 	Ribbon of St. George (147) 
Ukrainian flag (198) 	Wolfsangel (96) 		
Flag of UPA (212) 			
OUN Symbol (57) 			

~800 images with ~1500 annotated symbols



Train/Eval/Test separation 75:15:10 (per class)

# Evaluation

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# Training Results

- $mAP_{IoU=0.5} = 0.72$
- If proposed region and gold annotation match at least 50%, this region is correctly classified in 72% of the cases
- $IoU = \frac{\text{Intersection}}{\text{Union}}, \mathcal{W} = [0, 1]$   
Measure for congruence of proposed region with gold annotation
- **mean Average Precision**  
Relation of correctly classified regions to all classifications
- Typically  $mAP_{IoU=0.5}$  or  $mAP_{IoU=0.75}$  is used

## mAP per symbol

Flag of Ukraine: 0.51

Flag of UPA: 0.49

Ukrainian Coat of Arms: 0.63

Swastika: 0.80

SS runes: 0.69

Ribbon of St. George: 0.70

Hammer & Sickle: 0.72

Polish Coat of Arms: 0.75

Wolfsangel: 0.94

Symbol of OUN: 0.75

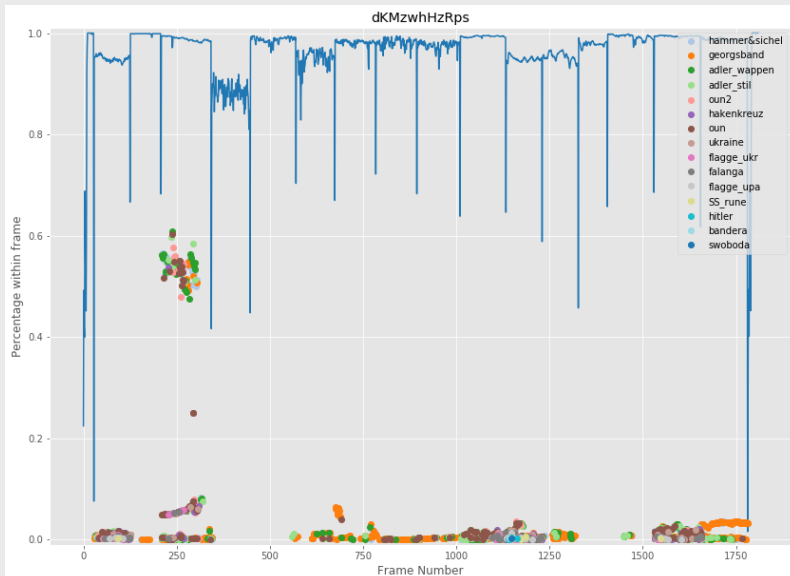
Swoboda: 0.58

Falanga: 0.93

## Results

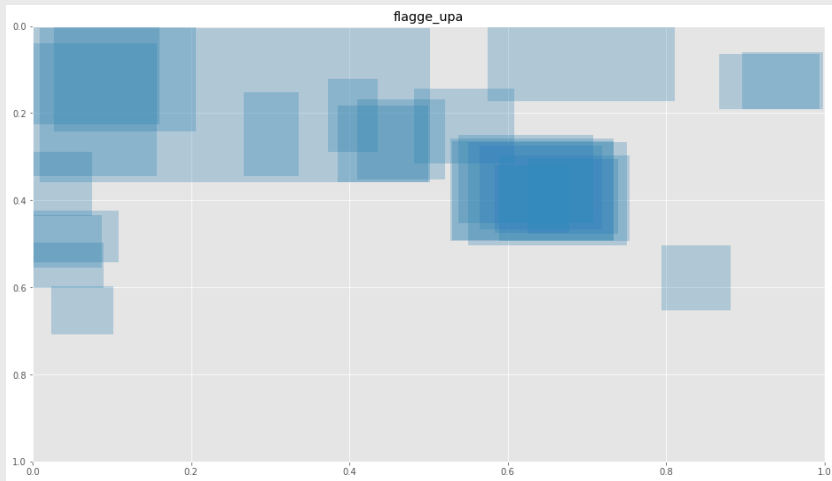
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# Symbols per video

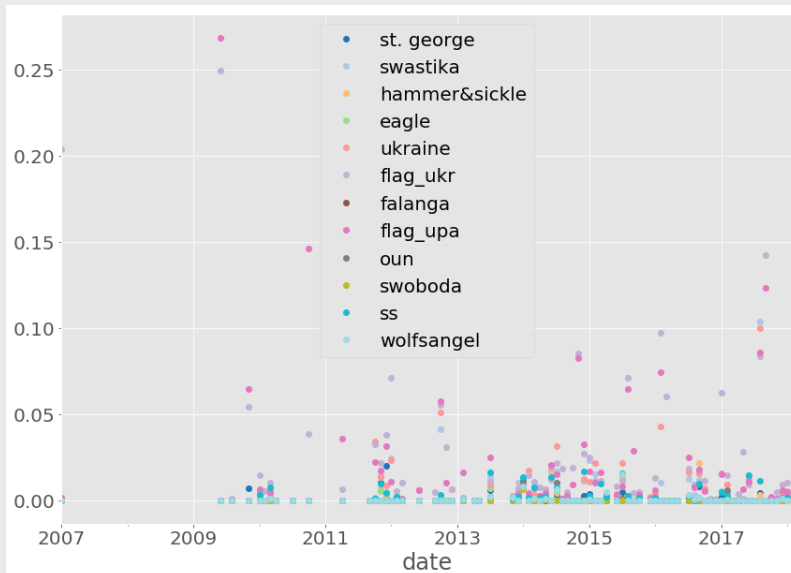




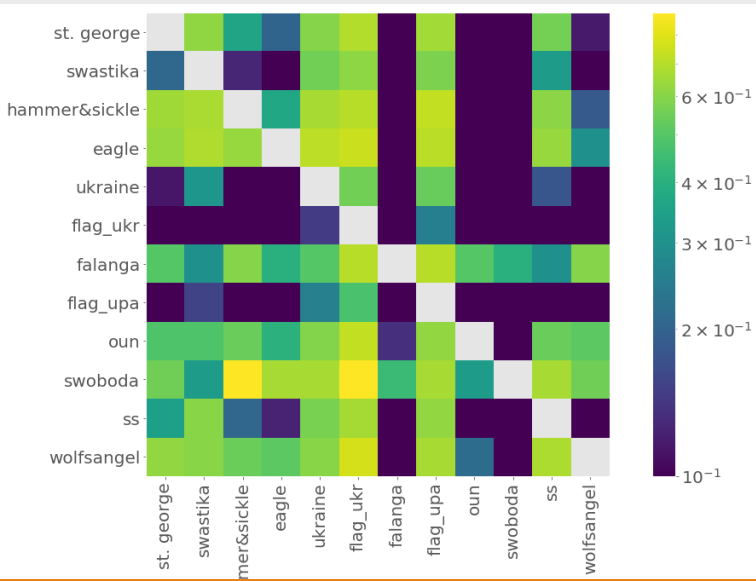
# Bounding boxes of a symbol



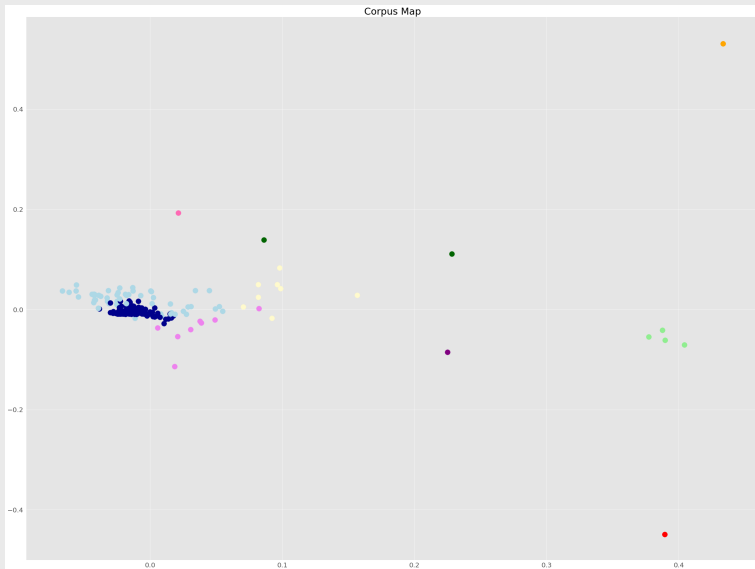
# Symbols over time



# Cooccurrences



# Corpus map



RCNN as a possibility to automatically extract complex  
symbolical information from visual media

Training is hard!

- Girshick, Ross u. a. (2018). Detectron: FAIR's research platform for object detection research, implementing popular algorithms like Mask R-CNN and RetinaNet. original-date: 2017-10-05T17:32:00Z. url: <https://github.com/facebookresearch/Detectron> (last access March 14, 2019).
- He, Kaiming, Georgia Gkioxari u. a. (2017). Mask R-CNN. In: arXiv:1703.06870 [cs]. arXiv: 1703.06870. url: <http://arxiv.org/abs/1703.06870> (last access March 14, 2019).
- He, Kaiming, Xiangyu Zhang u. a. (2015). Deep Residual Learning for Image Recognition. In: arXiv:1512.03385 [cs]. arXiv: 1512.03385. url: <http://arxiv.org/abs/1512.03385> (last access March 14, 2019).