PANOPTES – Automated Article Segmentation of Newspaper Pages for "Real Time Print Media Monitoring“

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ARGUS MEDIA BASED INTELLIGENCE

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Overview

Partners

Who are we

ARGUS der Presse AG
- Switzerland's leading media monitoring and information provider
- Experience of more than 100 years

ZHAW Datalab
- Interdisciplinary research group at Zurich University of Applied Sciences
- Combining the knowledge of different fields related to machine learning

The Project

What do we do

Goal
- Real Time Print Media Monitoring
  - Extraction of relevant articles from newspaper pages
  - Delivering articles to customers

Problem
- Fully automated article segmentation
- Identification of article elements (e.g. title, subtitle, etc.)

Approach

Rule based

Segmentation based on hardcoded rules

Rule examples
- Each article must contain a title
- Titles define article's width
- Articles are graphically separated by e.g. lines
- etc.

Pros
- Performance increases the more time is spent for finding rules
- Adding new rules is simple

Cons
- Not every case can be covered
- Adaptation to new layouts is costly manual work

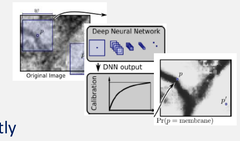
Image based

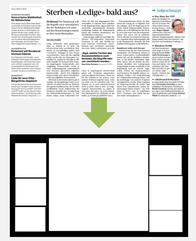
Segmentation based on visual features and deep learning

Approach
- Pixel classification (article/border) based on [1]

Pros
- Rules can be learned implicitly
- New layouts can be adapted automatically

Cons
- Success factors on new data and problems are unknown
- Training requires a huge amount of data





Text based

Segmentation based on textual features and neural nets

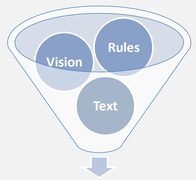
Approach
- Text block clustering (semantic distance) based on [2]

Pros
- Rules can be learned implicitly
- Not layout dependent

Cons
- Only text can be processed

Combination

Combination of rules, visual and textual features



Final segmentation

Result

References

[1] D. C. Ciresan, A. Giusti, L. M. Gambardella, and J. Schmidhuber. *Deep neural networks segment neuronal membranes in electron microscopy images.* In *NIPS*, pages 2852–2860, 2012.
[2] T. Mikolov, K. Chen, G. Corrado, and J. Dean. *Efficient Estimation of Word Representations in Vector Space.* In Proceedings of Workshop at *ICLR*, 2013.

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