Web Page Segmentation Revisited: Evaluation Framework and Dataset

CIKM 2020

Johannes Kiesel[1]

Florian Kneist[1]

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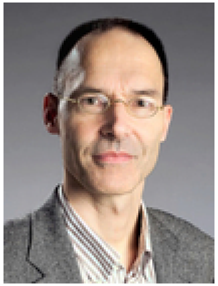
Kristof Komlossy[1]



Benno Stein[1]

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Bauhaus-Universität Weimar [1]

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Webis [1,2]

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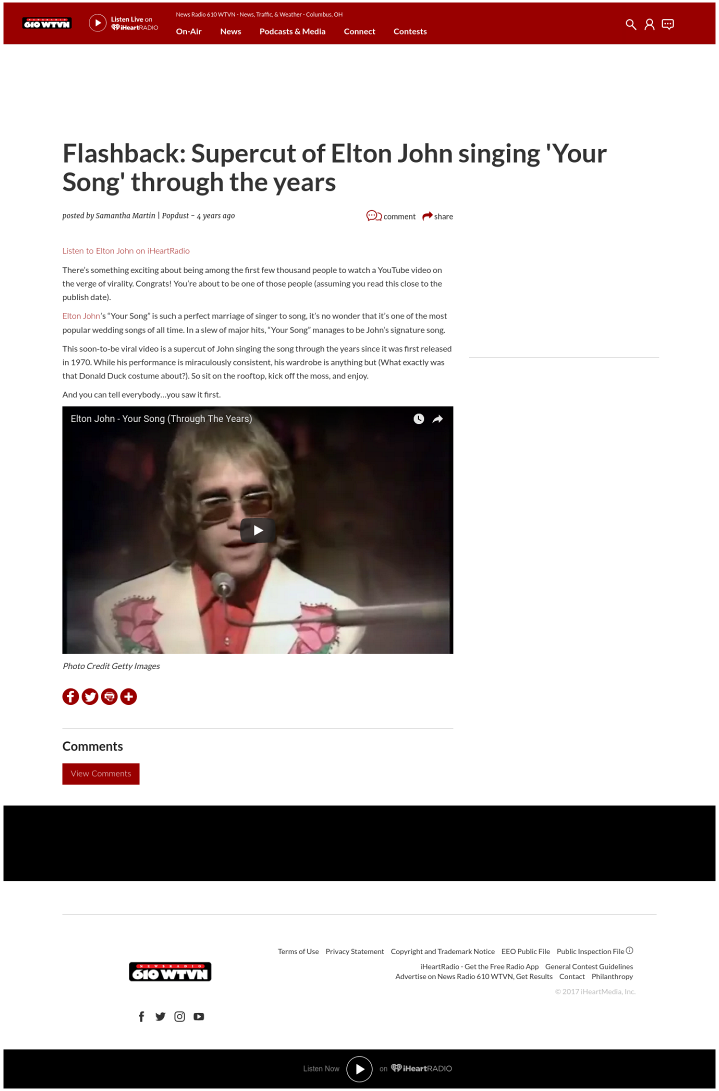

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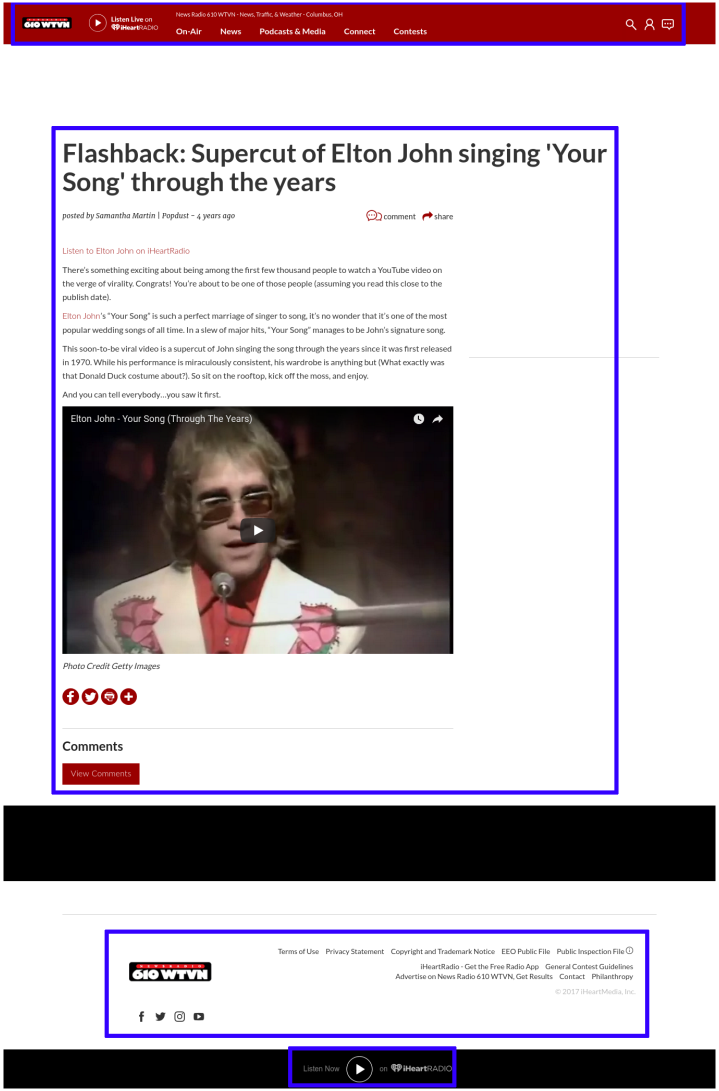

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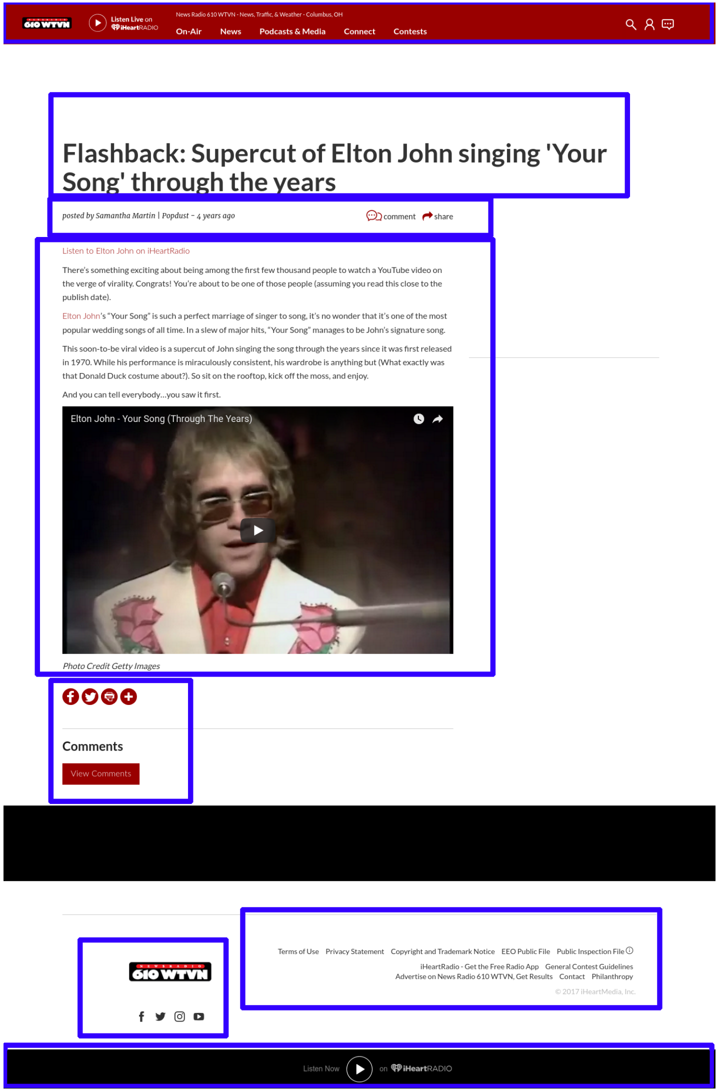

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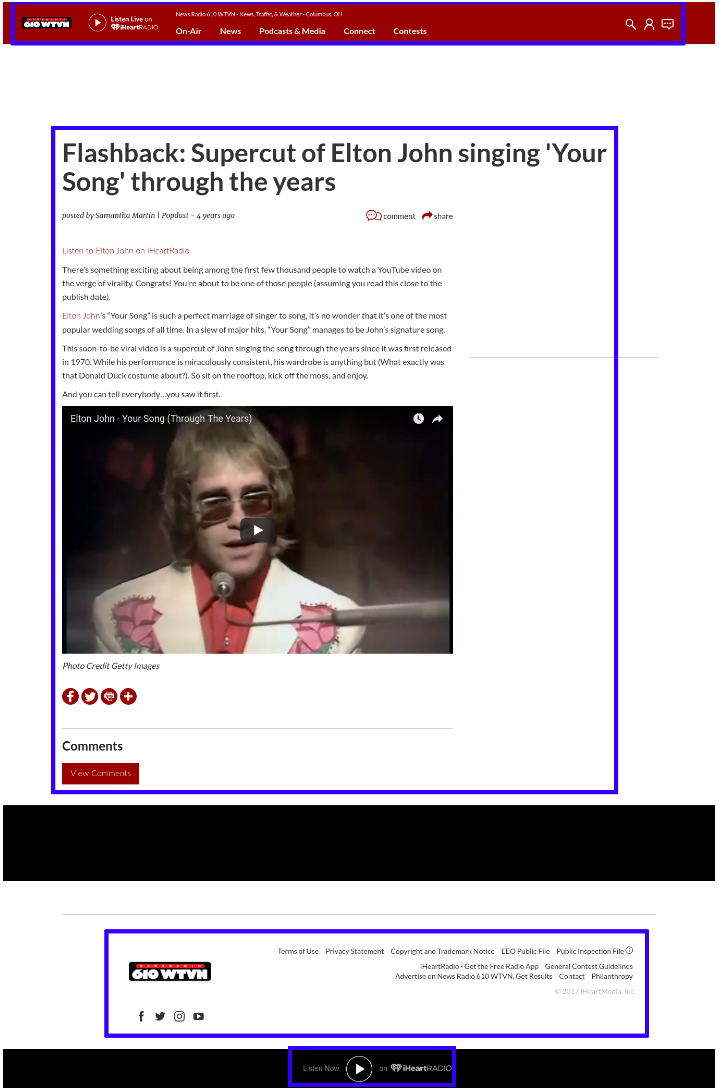

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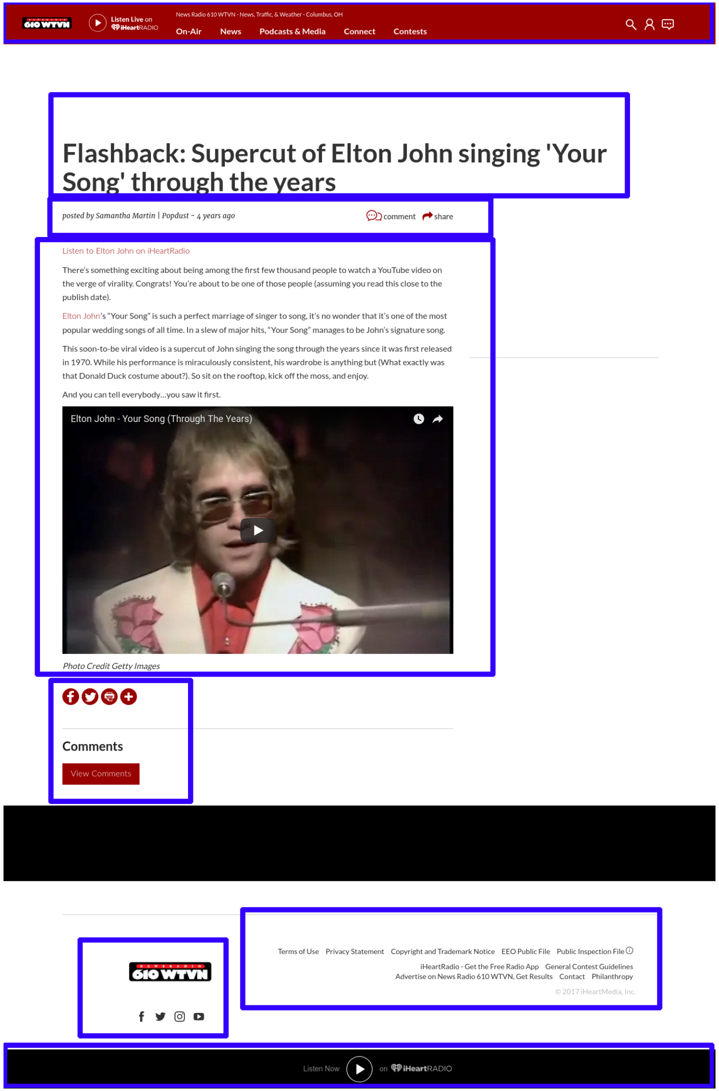

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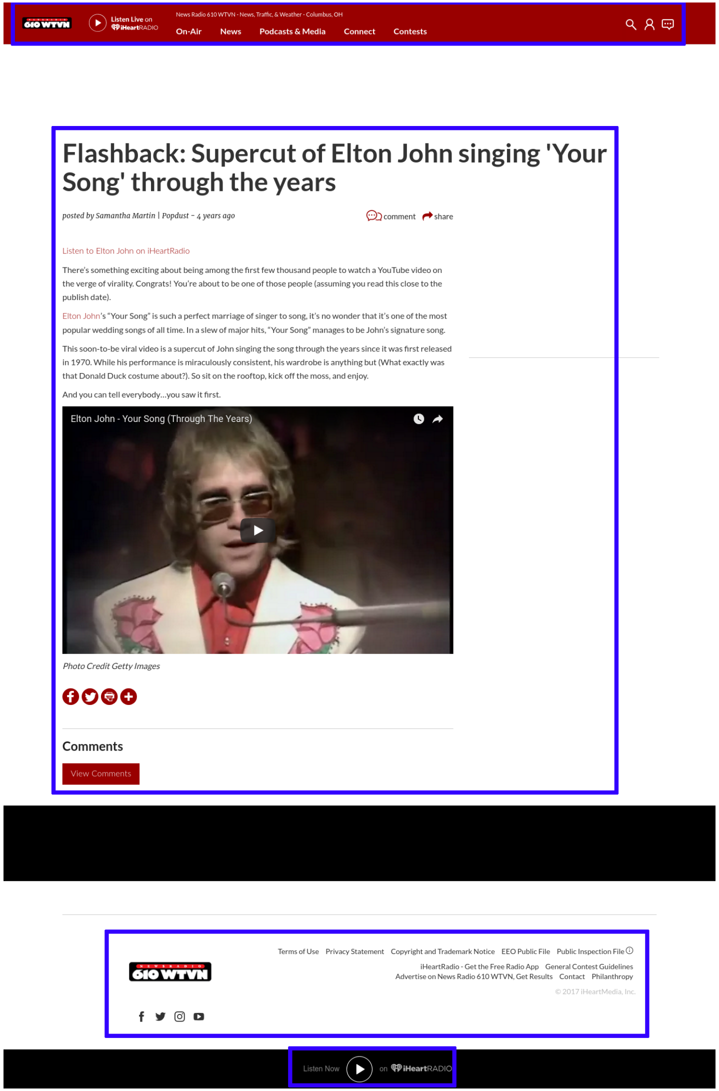

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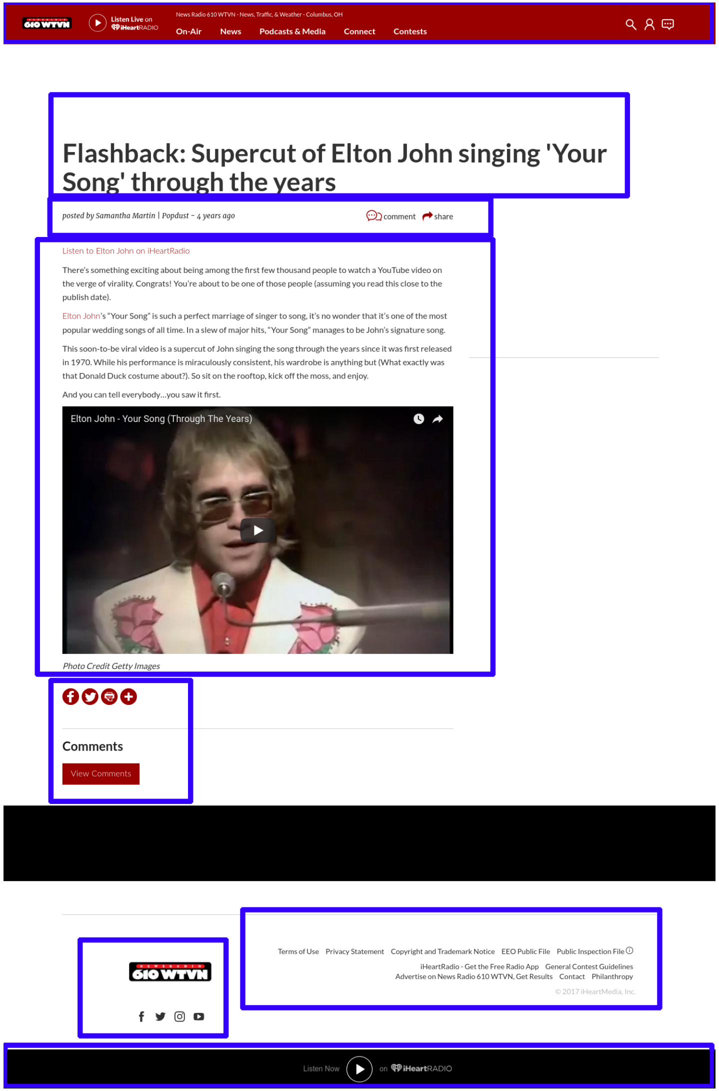

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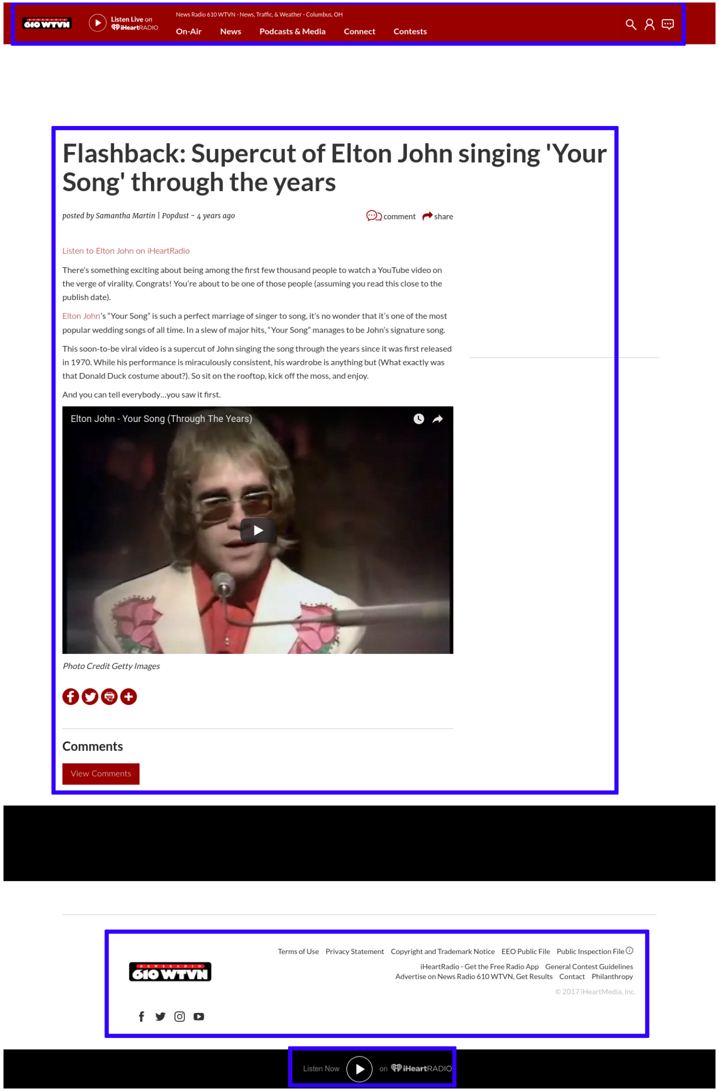

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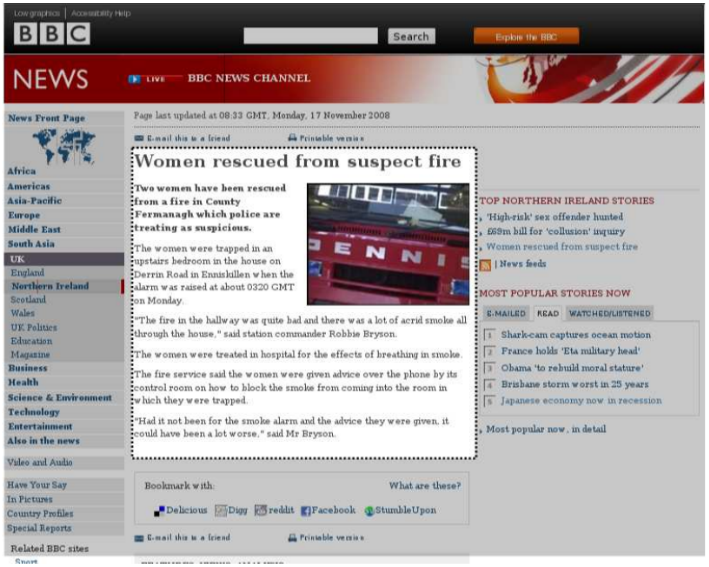

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Women rescued from suspect fire

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The women were treated in hospital for the effects of breathing in smoke.

The fire service said the women were given advice over the phone by its control room on how to block the smoke from coming into the room in which they were trapped.

"Had it not been for the smoke alarm and the advice they were given, it could have been a lot worse," said Mr Bryson.

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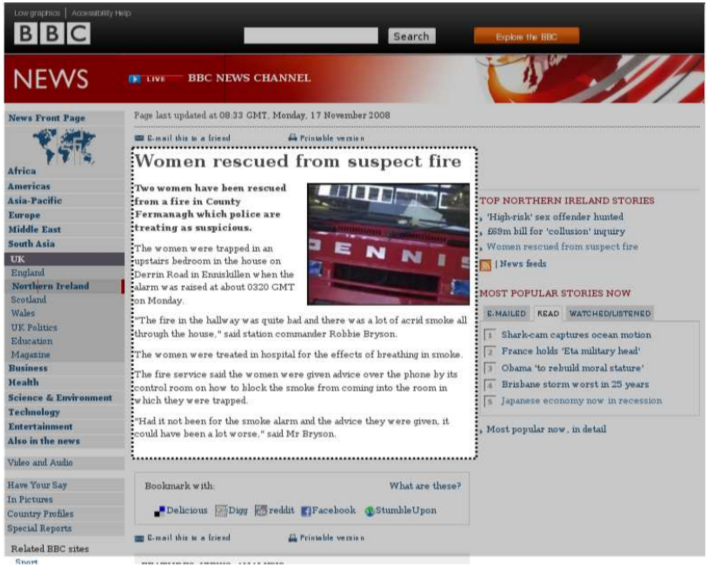

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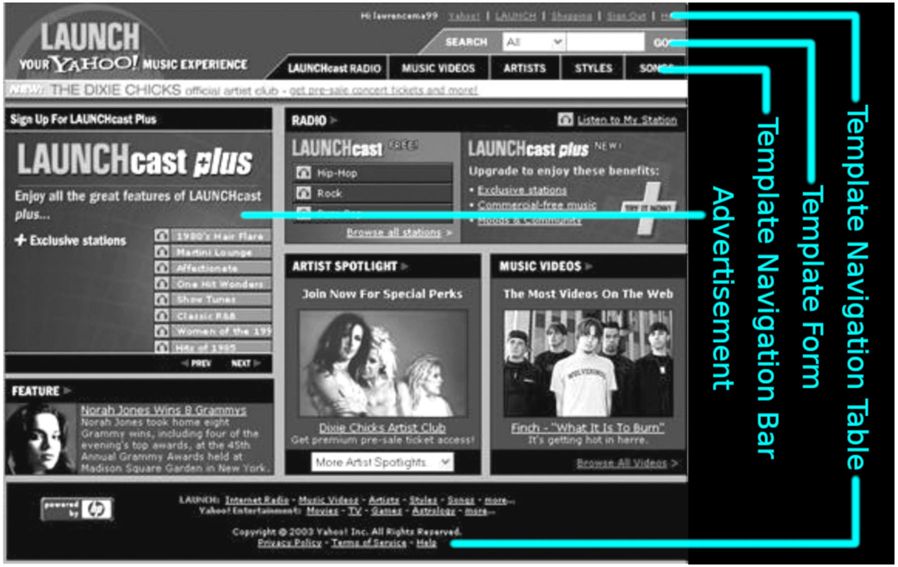

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Norah Jones Wins 8 Grammys

Norah Jones took home eight Grammy wins, including four of the evening's top awards, at the 45th Annual Grammy Awards held at Madison Square Garden in New York.

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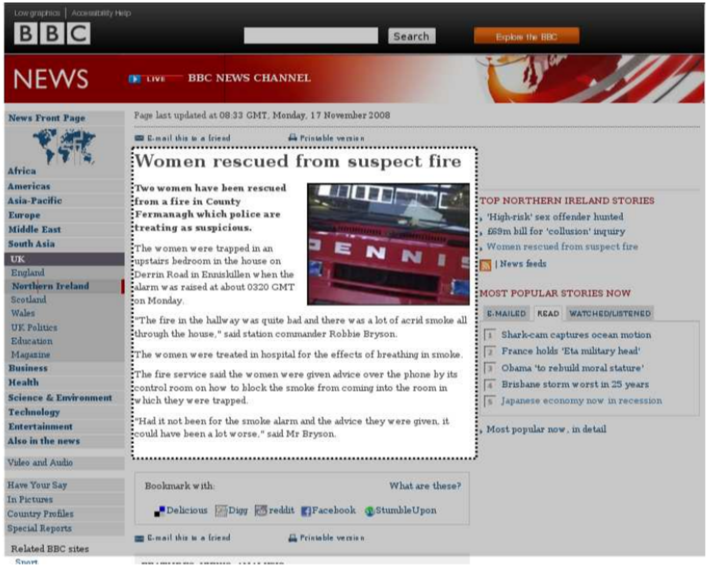
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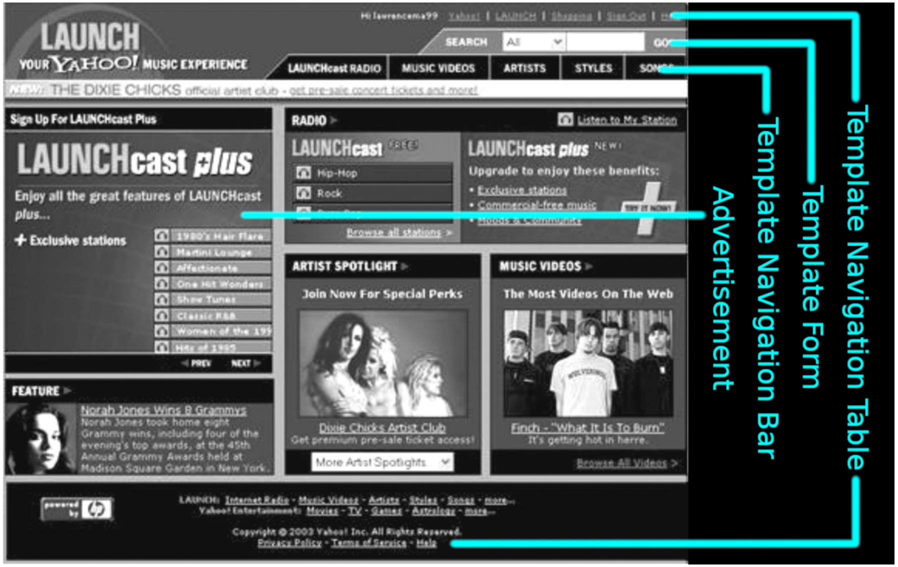

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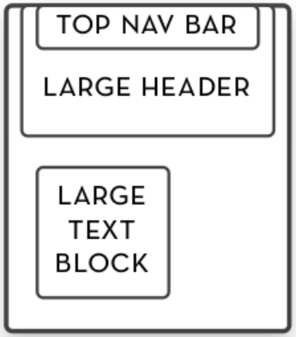
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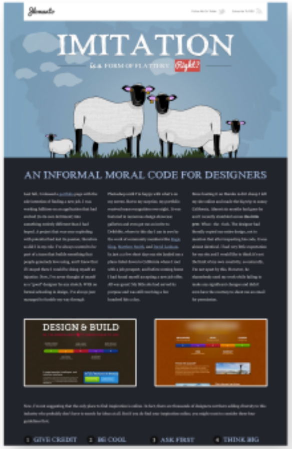
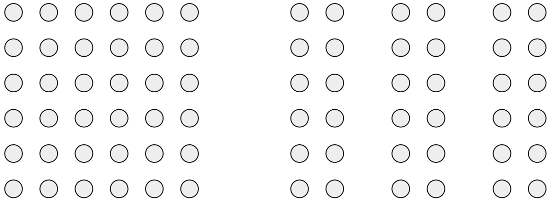


Concept Formation: Web Page Segment

A web page segment is a part of a web page containing those elements that belong together as per agreement among a majority of viewers.

Rationale: Web pages are created for human viewers, and so are segments

Gestalt Principles provide common ground



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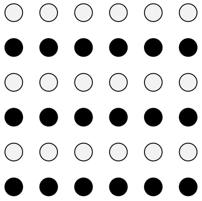

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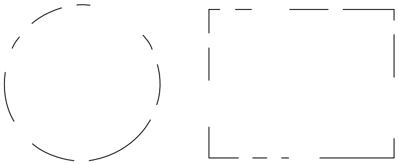

Closure

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Symmetry

Evaluation Framework for Web Page Segmentation

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Elements $E = \{e_1, \ldots, e_n\}$

Segmentation $S = \{s_1, \ldots, s_m\}$ with segments $s_i \subseteq E$

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Segmentation $S = \{s_1, \ldots, s_m\}$ with segments $s_i \subseteq E$

Suggested sets of elements:

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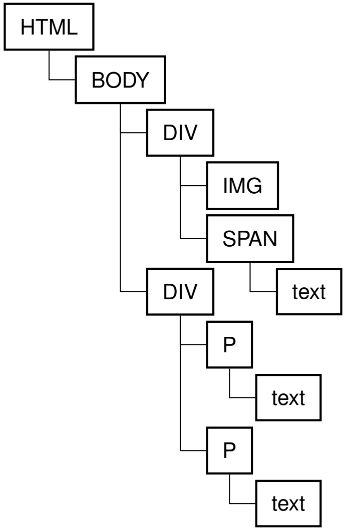
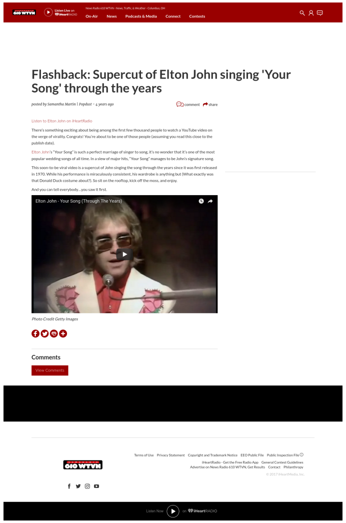
Characters



DOM nodes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And you can tell everybody...you saw it first.

Elton John - Your Song (Through The Years)

Photo Credit Getty Images

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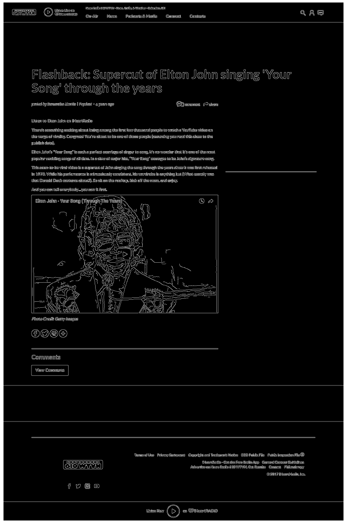
Pixels



Edges

Evaluation Framework for Web Page Segmentation

A web page segment is a part of a web page containing those elements that belong together as per agreement among a majority of viewers.

Elements $E = \{e_1, \ldots, e_n\}$

Segmentation $S = \{s_1, \ldots, s_m\}$ with segments $s_i \subseteq E$

Precision

$$P_{B^3}(S, S^*) = \text{avg}_e \left(\frac{|\text{elements in same segment as } e \text{ in both } S \text{ and } S^*|}{|\text{elements in same segment as } e \text{ in } S|} \right)$$

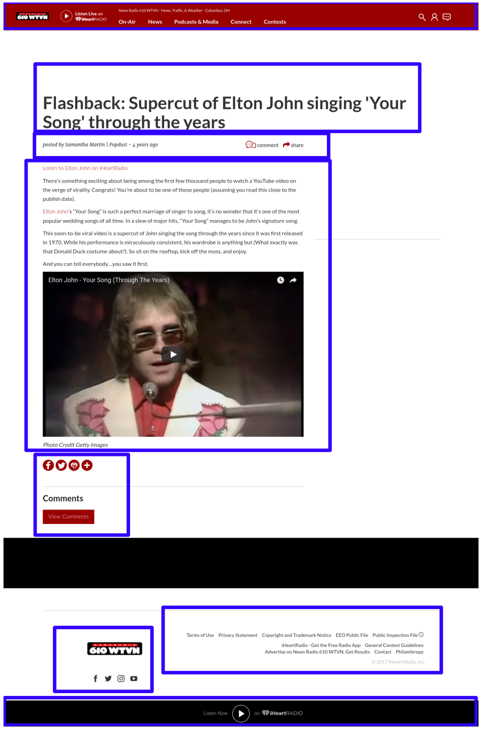
Recall

$$R_{B^3}(S, S^*) = \text{avg}_e \left(\frac{|\text{elements in same segment as } e \text{ in both } S \text{ and } S^*|}{|\text{elements in same segment as } e \text{ in } S^*|} \right)$$

F-Measure, F_{B^3}, is defined as the harmonic mean of precision and recall as usual

Note: $P_{B^3}(S, S') = R_{B^3}(S', S) \quad \Rightarrow \quad F_{B^3}(S, S') = F_{B^3}(S', S)$

Evaluation Framework for Web Page Segmentation



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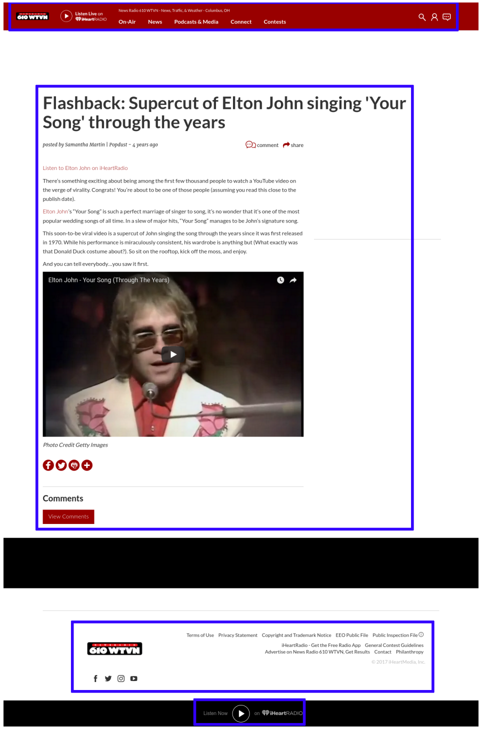
$\overset{?}{\approx}$



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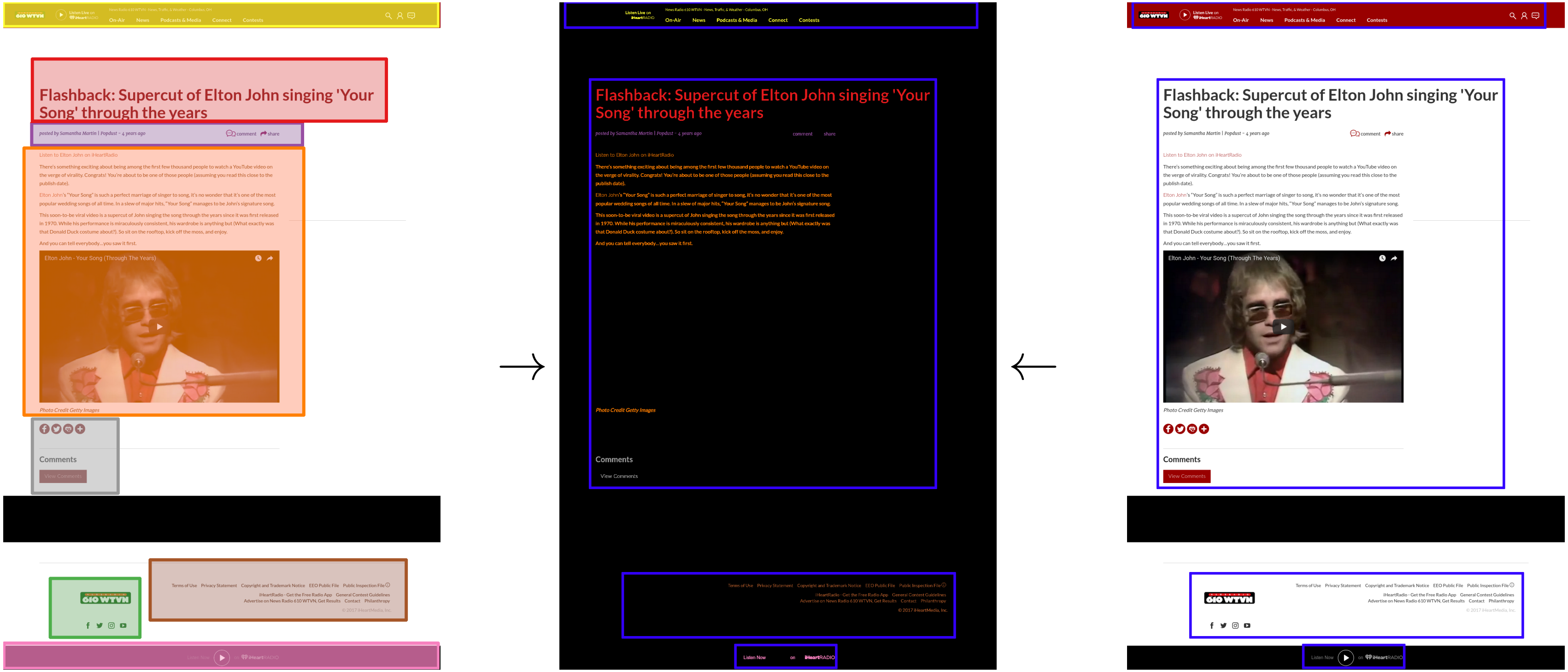

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S → Characters of S in S^* ← S^*

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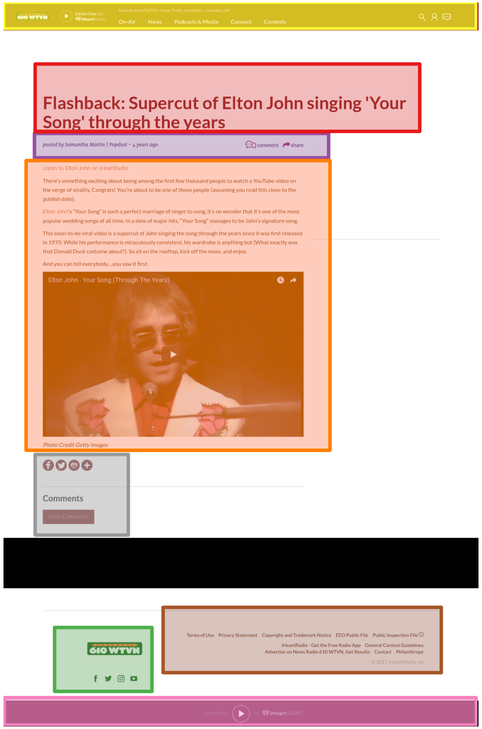

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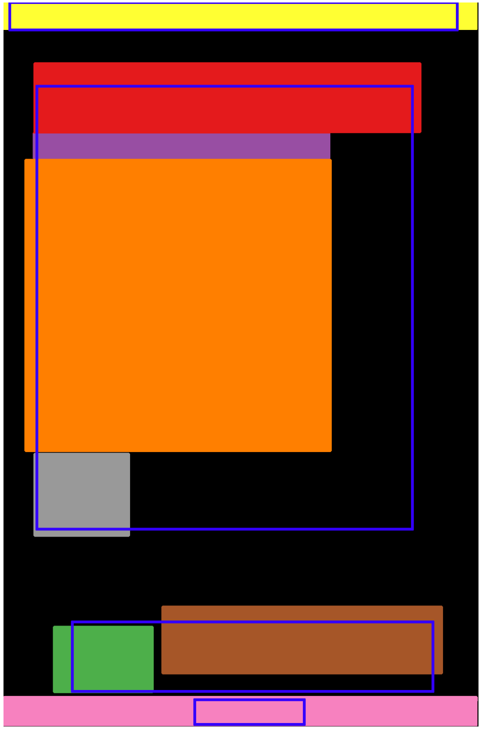
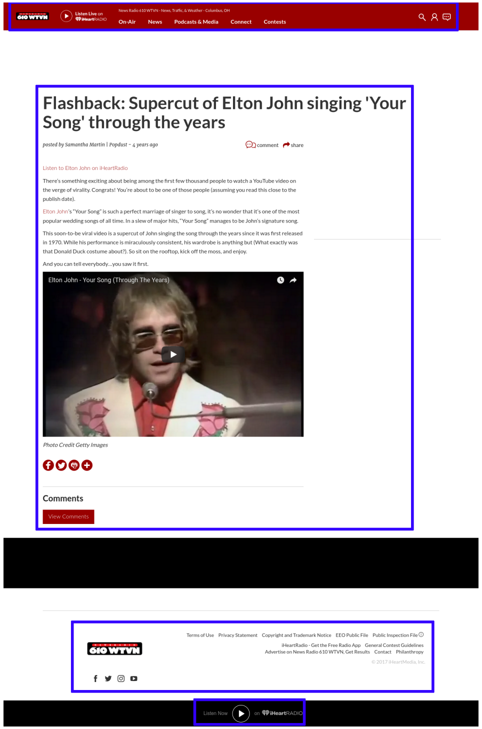
S

→



Pixels of S in S^*

←



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S^*

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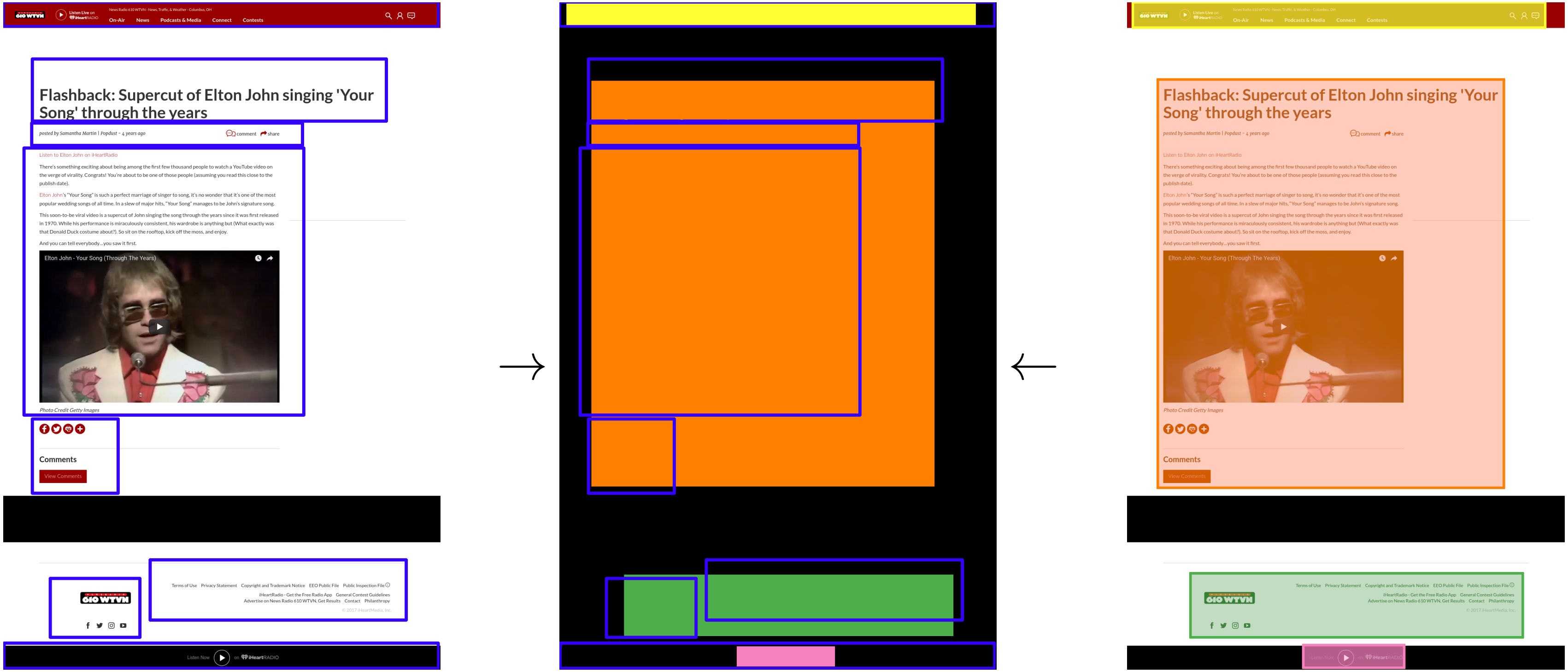

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S

Pixels of S^* in S

S^*

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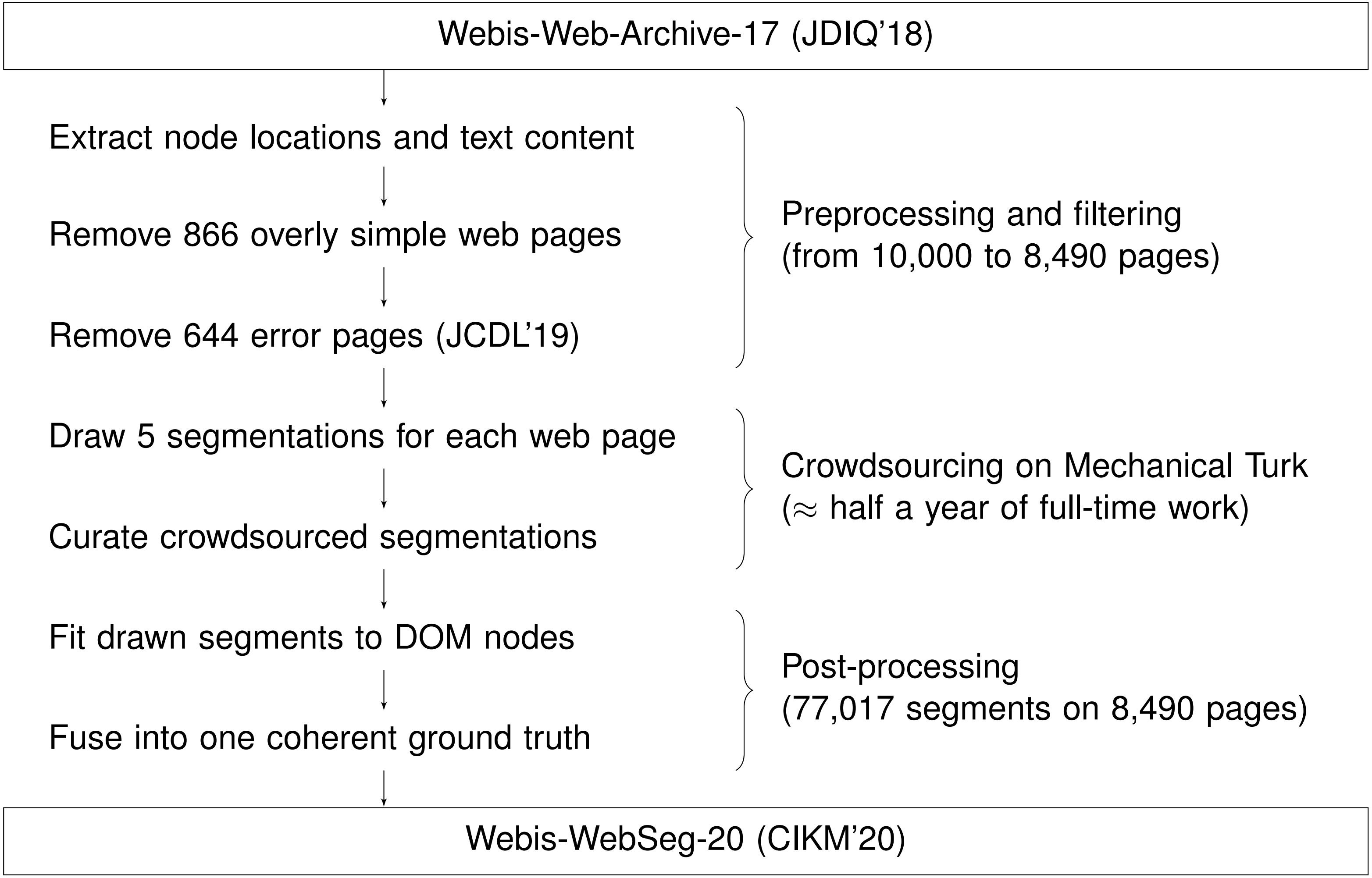
The Webis-WebSeg-20 Dataset



Webis-Web-Archive-17 (JDIQ’18)

Extract node locations and text content

Remove 866 overly simple web pages

Remove 644 error pages (JCDL’19)

Preprocessing and filtering
(from 10,000 to 8,490 pages)

Draw 5 segmentations for each web page

Curate crowdsourced segmentations

Crowdsourcing on Mechanical Turk
(≈ half a year of full-time work)

Fit drawn segments to DOM nodes

Fuse into one coherent ground truth

Post-processing
(77,017 segments on 8,490 pages)

Webis-WebSeg-20 (CIKM’20)

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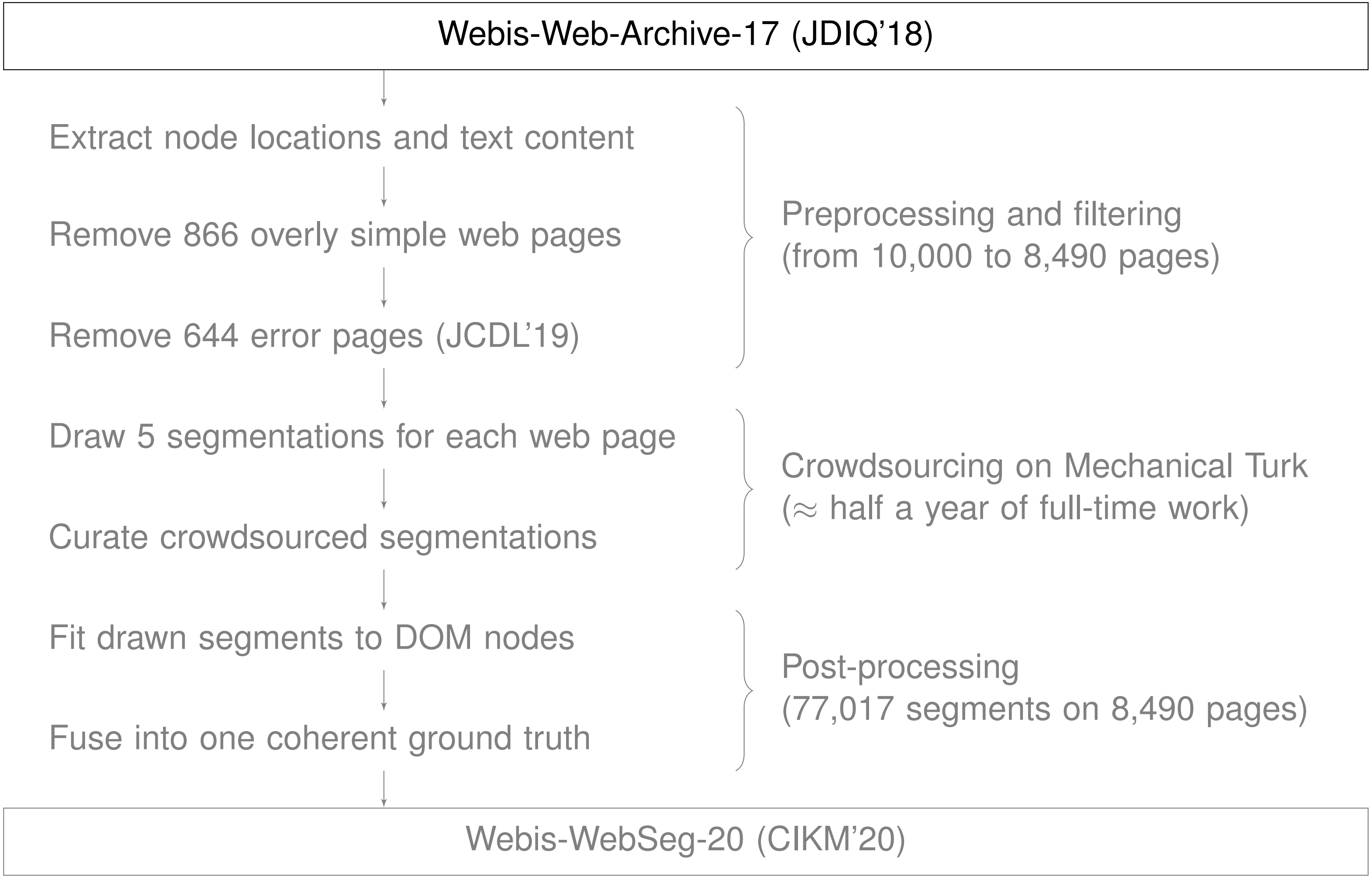

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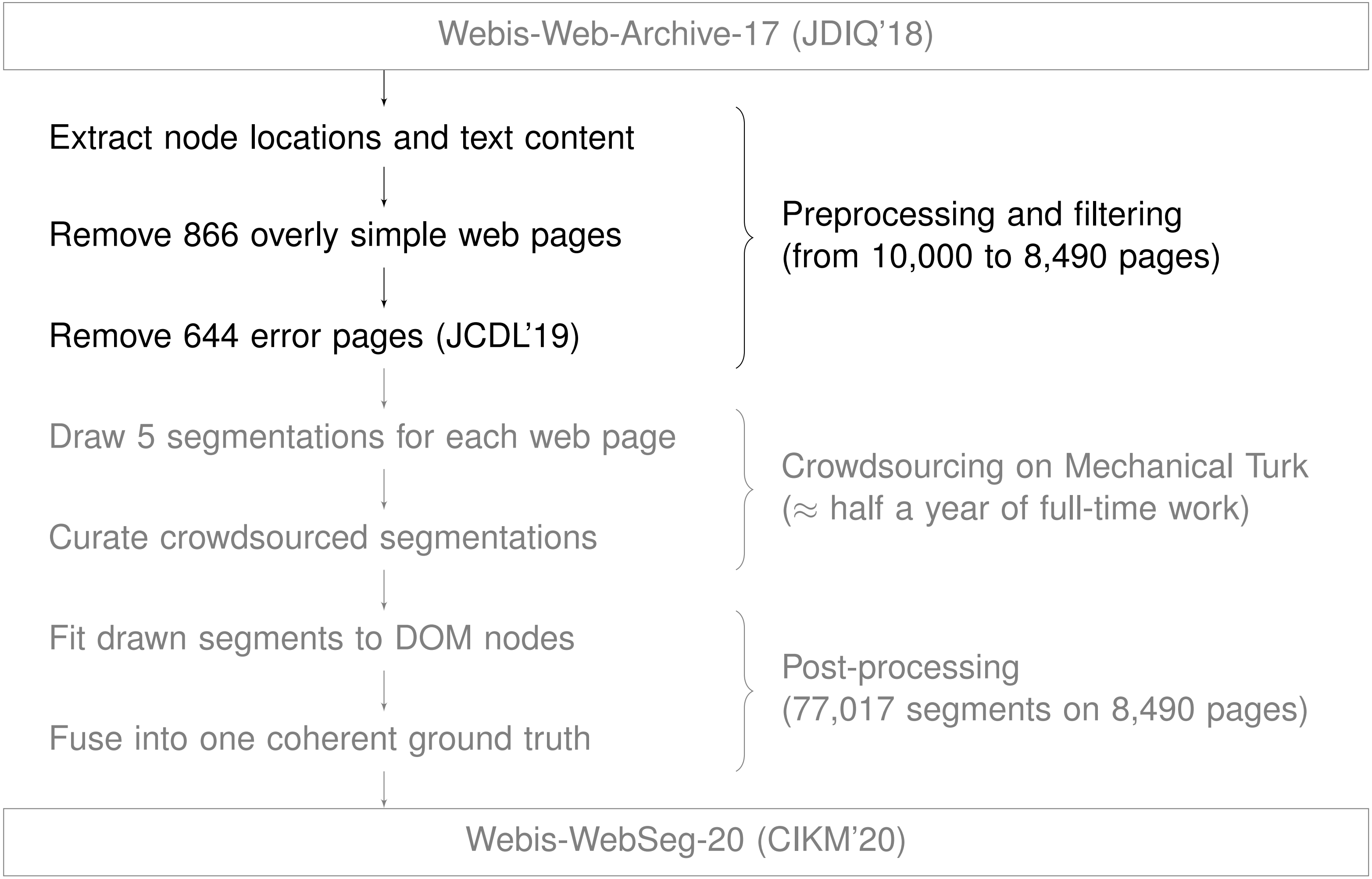

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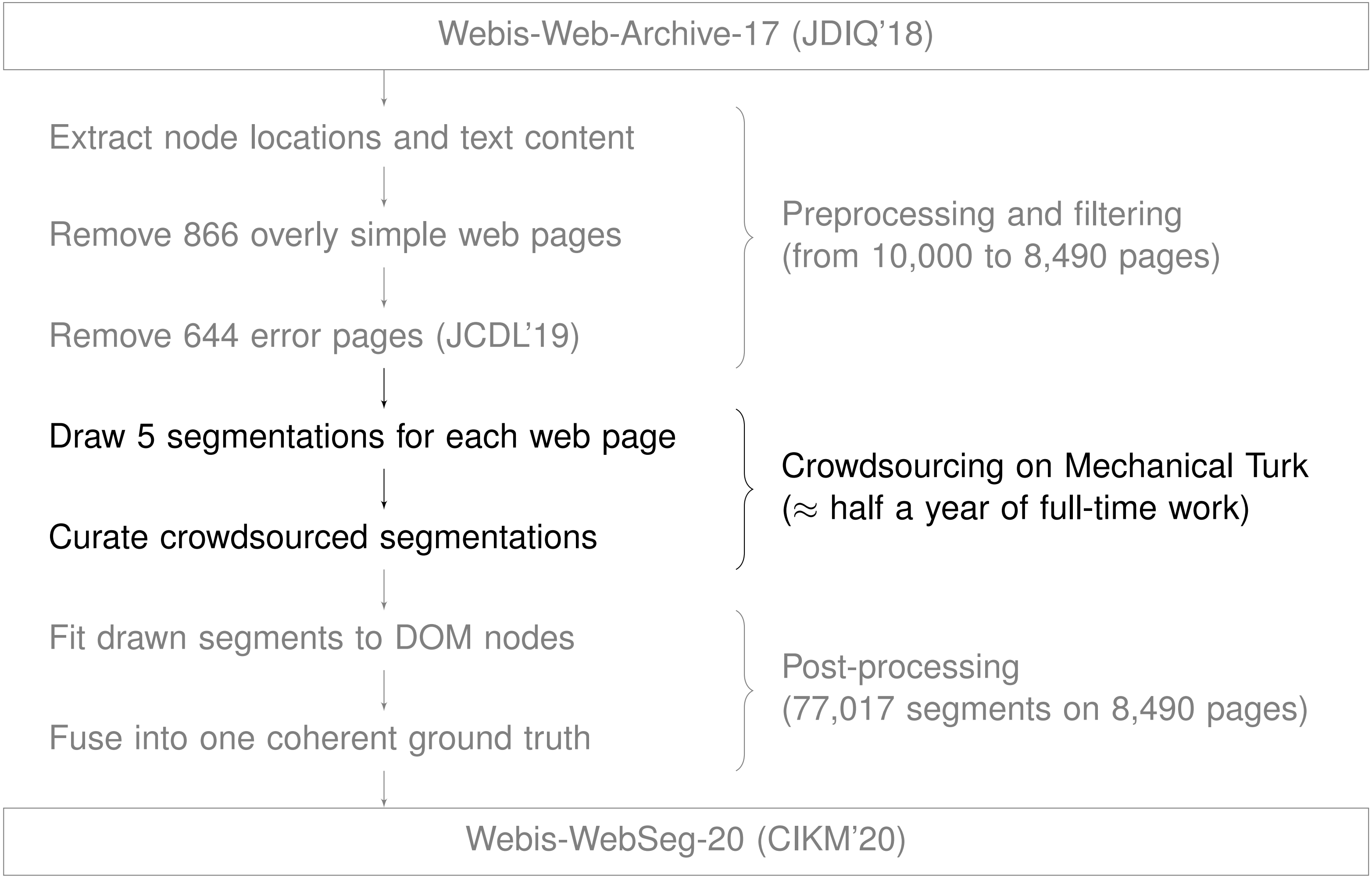

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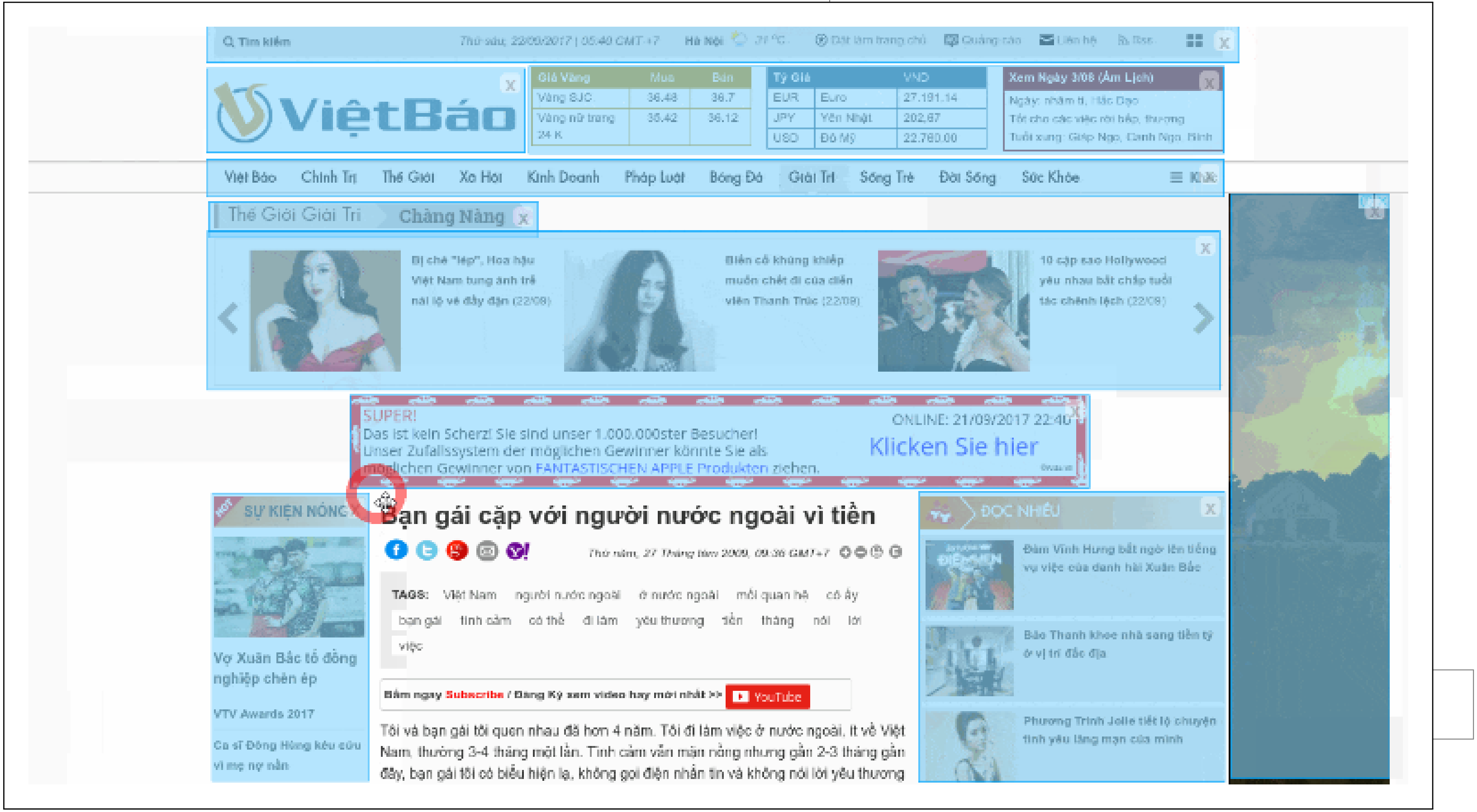

Giá Vàng	Mua	Bán
Vàng SJC	36.48	36.7
Vàng nữ trang 24 K	36.42	36.12

Tỷ Giá		VND
EUR	Euro	27.191.14
JPY	Yên Nhật	202,67
USD	Đô Mỹ	22.760.00

Xem Ngày 3/08 (Âm Lịch)

Ngày: nhâm tí, Hắc Đạo

Tốt cho các việc nói hẹp, thương

Tuổi xung: Giáp Ngọ, Canh Ngọ, Bính

Bị chê "lép", Hoa hậu Việt Nam tung ảnh trễ nải lộ vẻ đầy đặn (22/08)

Biến cố khủng khiếp muốn chết đi của diễn viên Thanh Trúc (22/08)

10 cặp sao Hollywood yêu nhau bất chấp tuổi tác chênh lệch (22/08)

SUPER!

ONLINE: 21/09/2017 22:40

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VTV Awards 2017

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Bạn gái cặp với người nước ngoài vì tiền

Thứ năm, 27 Tháng tám 2009, 09:36 GMT+7

TAGS: Việt Nam, người nước ngoài, ở nước ngoài, mối quan hệ, cô ấy, bạn gái, tình cảm, có thể, đi làm, yêu thương, tiền, tháng, nói, lời, việc

Bấm ngay Subscribe / Đăng Ký xem video hay mới nhất >> YouTube

Tôi và bạn gái tôi quen nhau đã hơn 4 năm. Tôi đi làm việc ở nước ngoài, ít về Việt Nam, thường 3-4 tháng một lần. Tình cảm vẫn mặn nồng nhưng gần 2-3 tháng gần đây, bạn gái tôi có biểu hiện lạ, không gọi điện nhắn tin và không nói lời yêu thương

Đàm Vĩnh Hưng bất ngờ lên tiếng vụ việc của danh hài Xuân Bắc

Bảo Thanh khoe nhà sang tiền tỷ ở vị trí đắc địa

Phương Trinh Jolie tiết lộ chuyện tình yêu lãng mạn của mình

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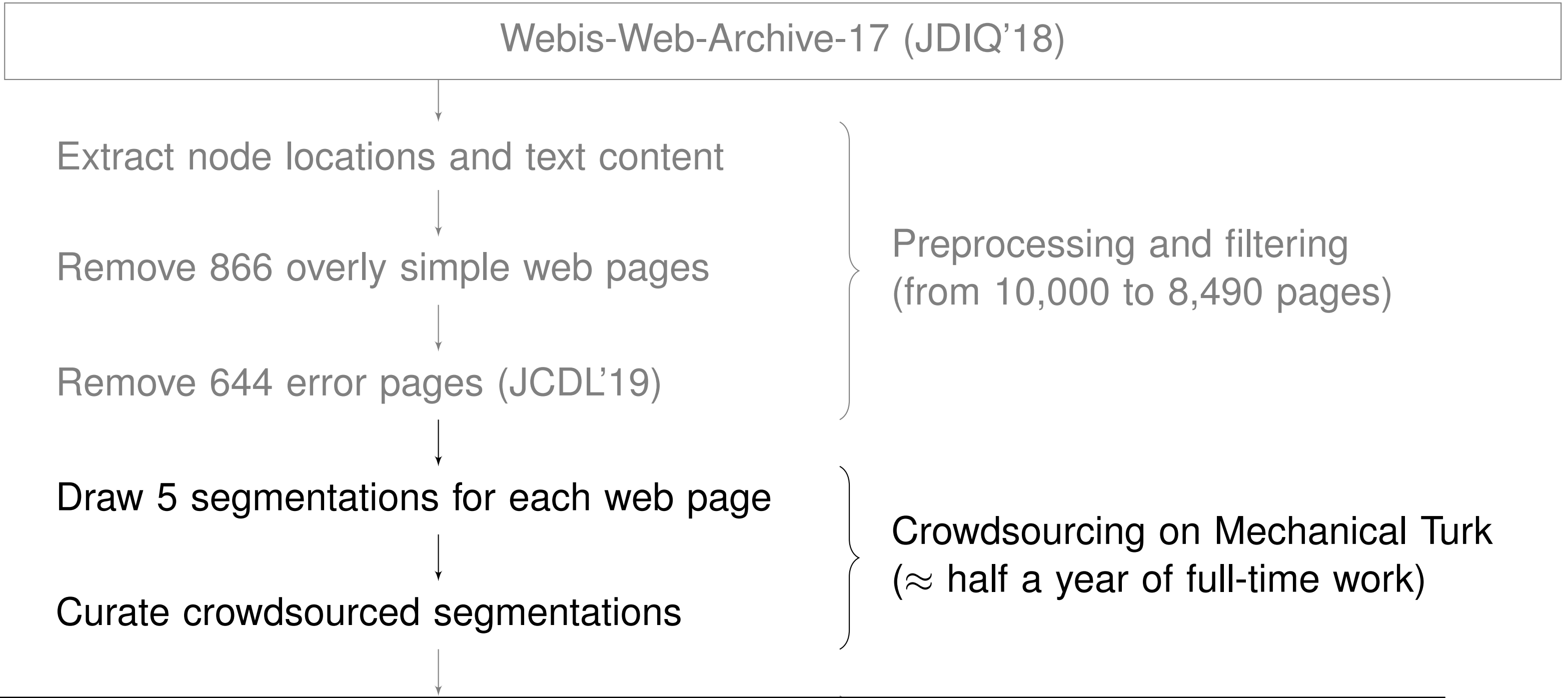

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es)

Agreement measure	Elements			
	Characters	Nodes	Pixels	Edges
F_{B^3}	0.78	0.74	0.65	0.73

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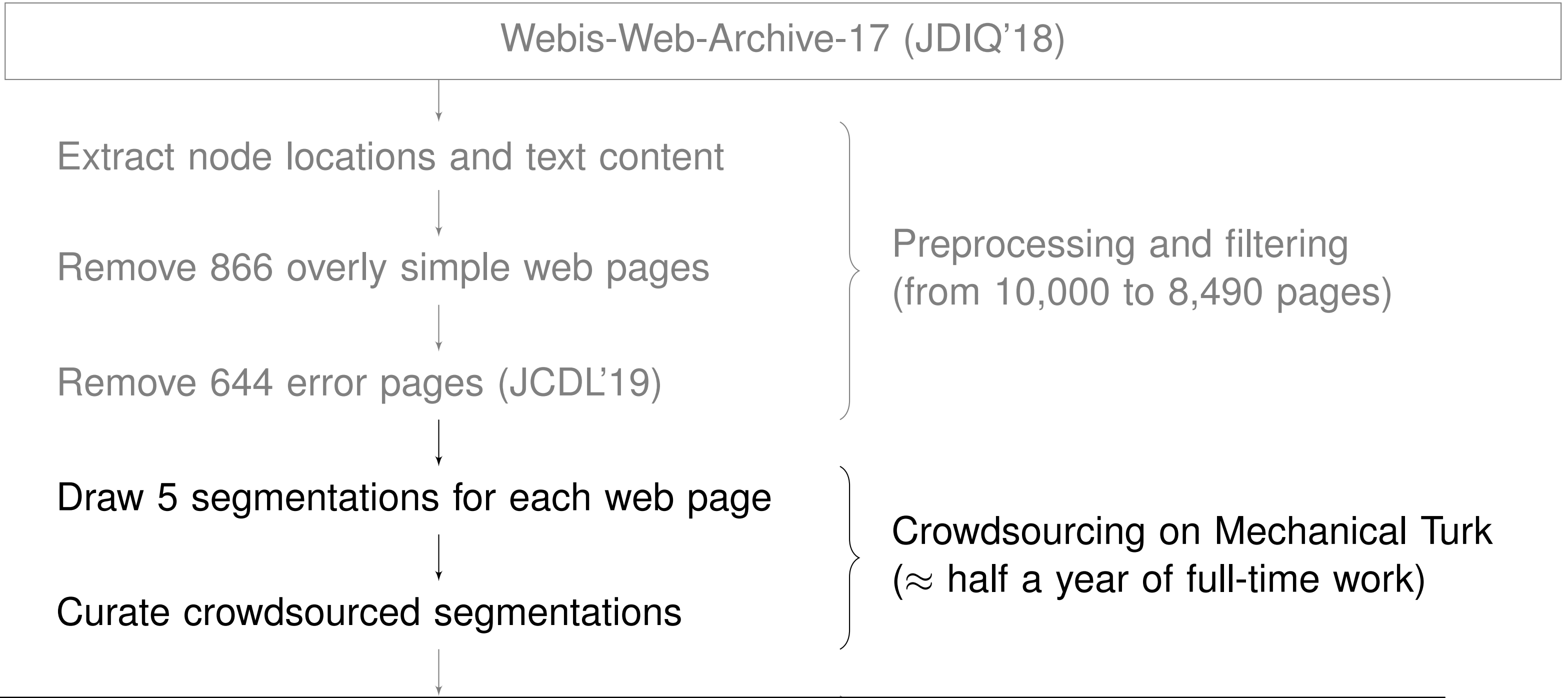

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max(P_{B^3}, R_{B^3})	0.97	0.95	0.94	0.96

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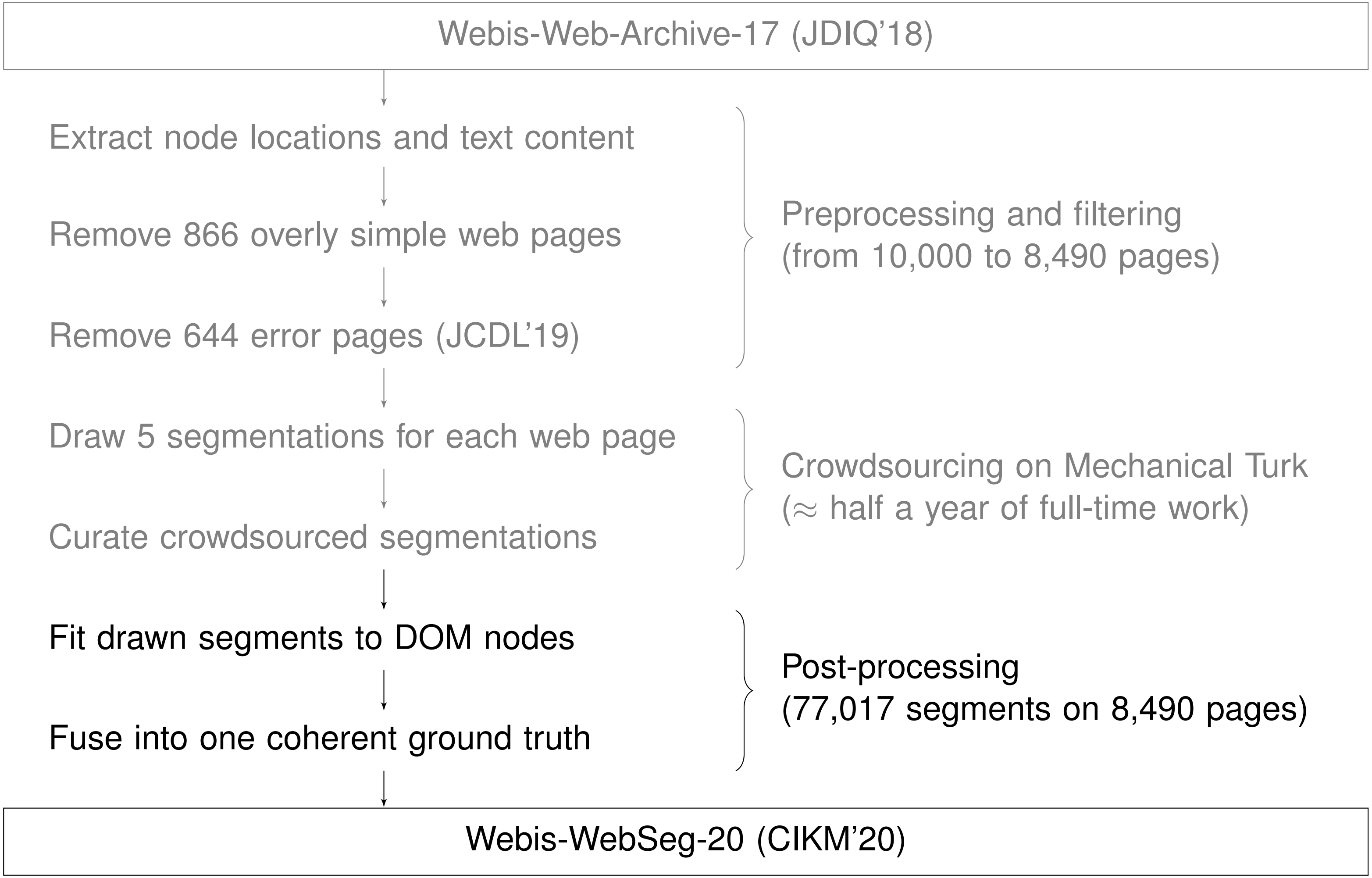

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Web Page Segmentation Revisited: Evaluation Framework and Dataset

Evaluation Framework for Web Page Segmentation

- Segmentation similarity, quality, and fusion
- Comparison of level of detail of segmentations
- Adjustable for different downstream tasks

Webis-WebSeg-20

- 8,490 pages from 4,824 sites
- 5 human annotators each page
- Segments in “Simple Feature Access” standard
- Web pages provided in several representations:
  - HTML file
  - Screenshot
  - Screenshot coordinates of DOM nodes
  - Webis-Web-Archive-17 WARC file

`https://webis.de/publications.html?q=johannes+kiesel+web+archive#stein_2020w`

Paper, browser, code, data