



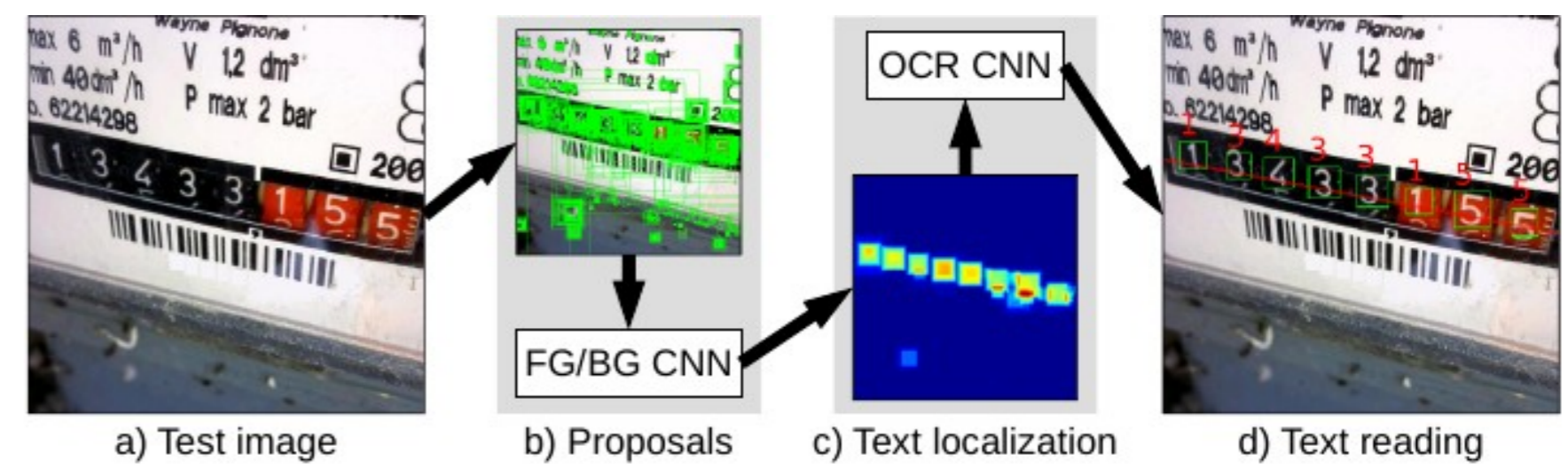
Augmented Text Character Proposals and Convolutional Neural Networks for Text Spotting from Scene Images



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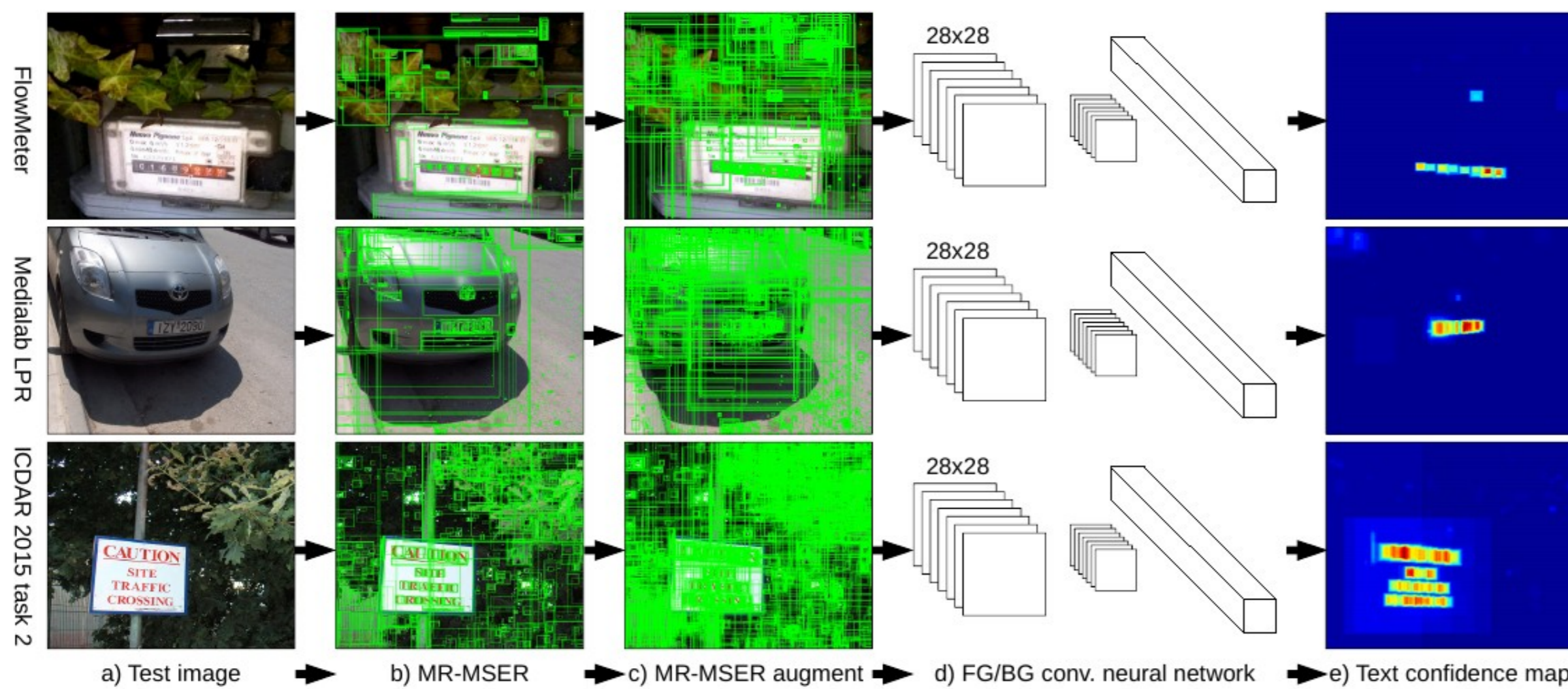
Idea

Augmenting MR-MSER to maximize their coverage rate over text elements in scene images, to obtain satisfying text detection rates without the need of using very deep CNN architectures nor large amount of training data.



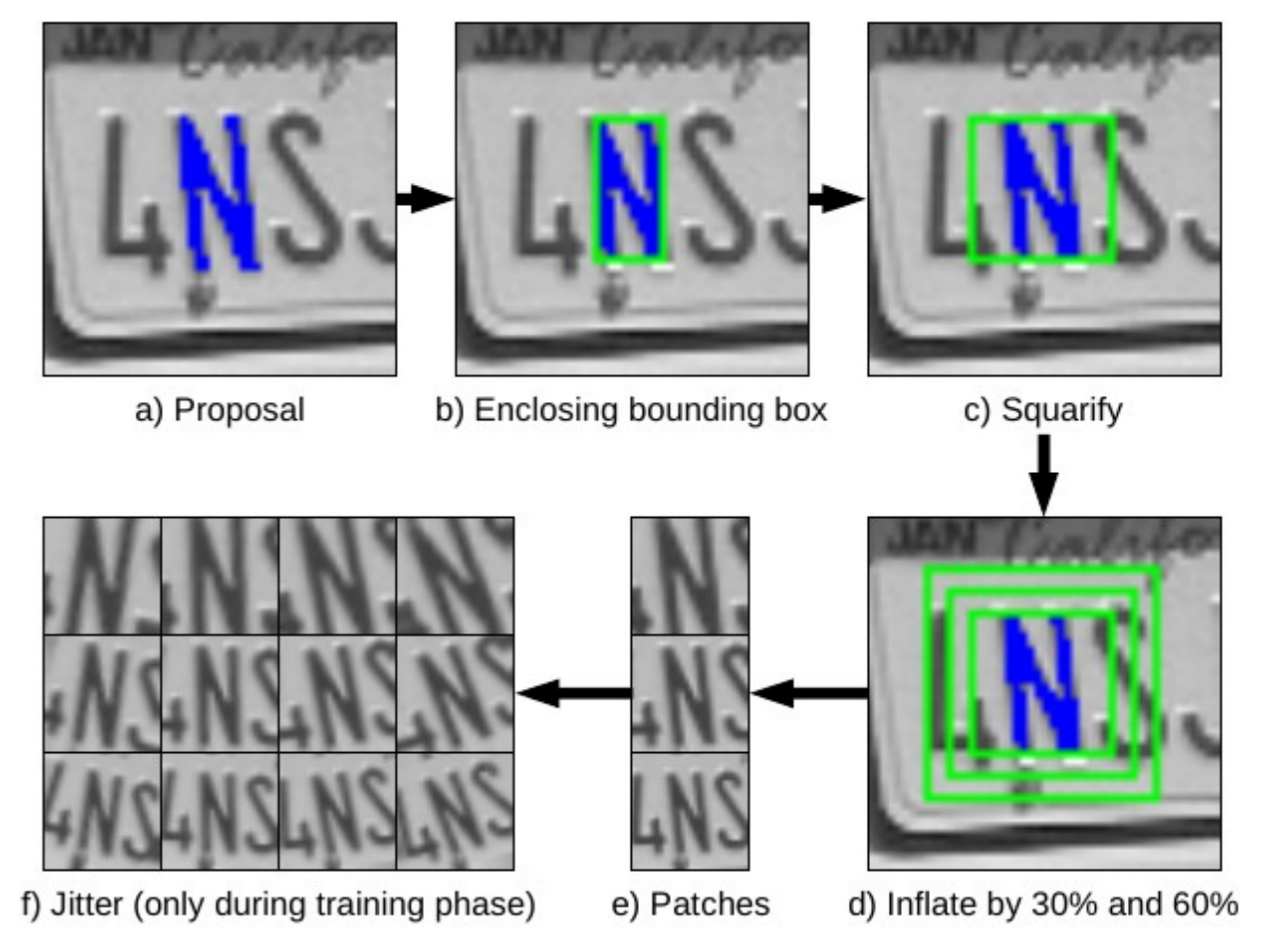
Text Localization - Pipeline

MR-MSER proposals extracted from the given test images (a,b) are augmented (c) and processed by the text localization CNN (d). FG/BG prediction values are stacked together to form text confidence maps (e).



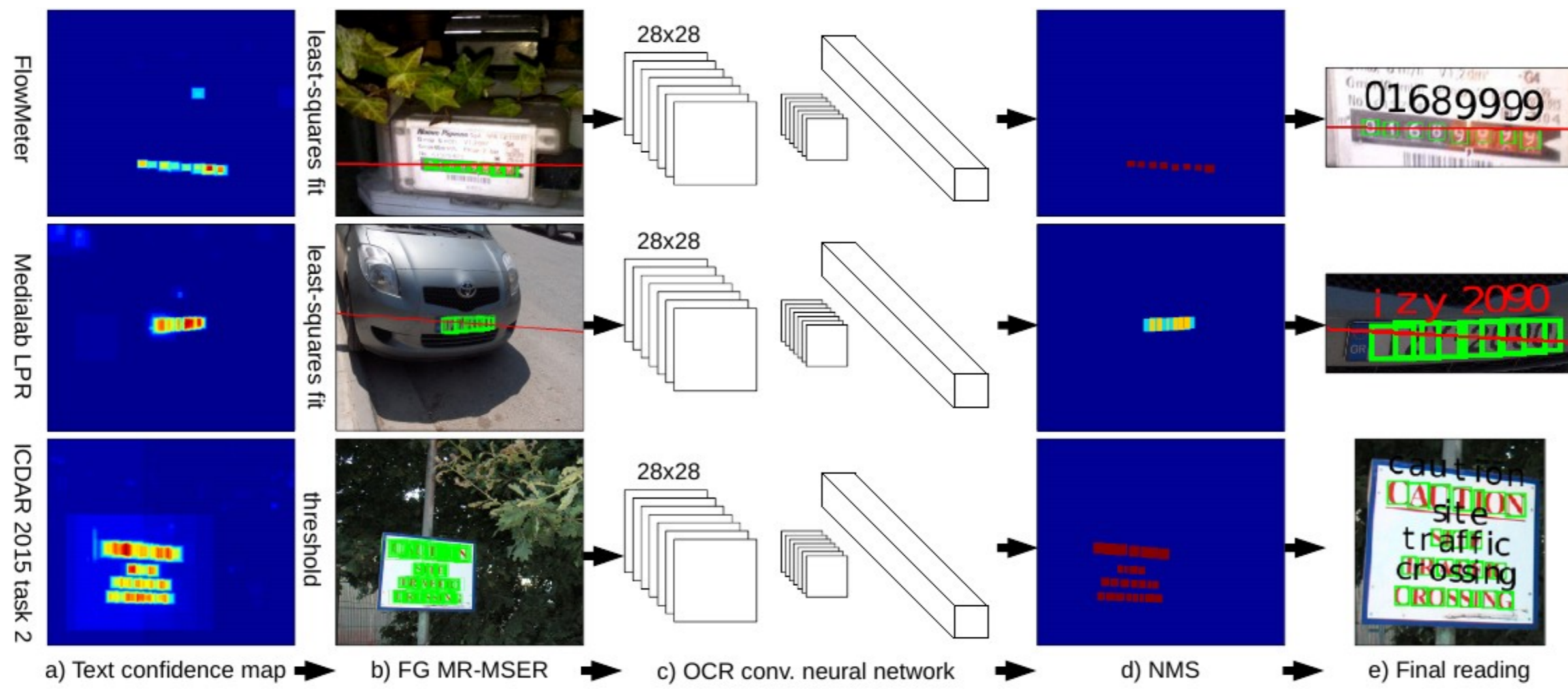
Augmented MR-MSER (aMR-MSER)

Given a MR-MSER and its bbox (a,b): the bbox is squarified without moving its center (c); two additional bboxes are obtained by inflating the squarified bbox by 30% and 60% of its area (d); resulting patches are randomly rotated within $[-\pi/4; \pi/4]$ (e,f).

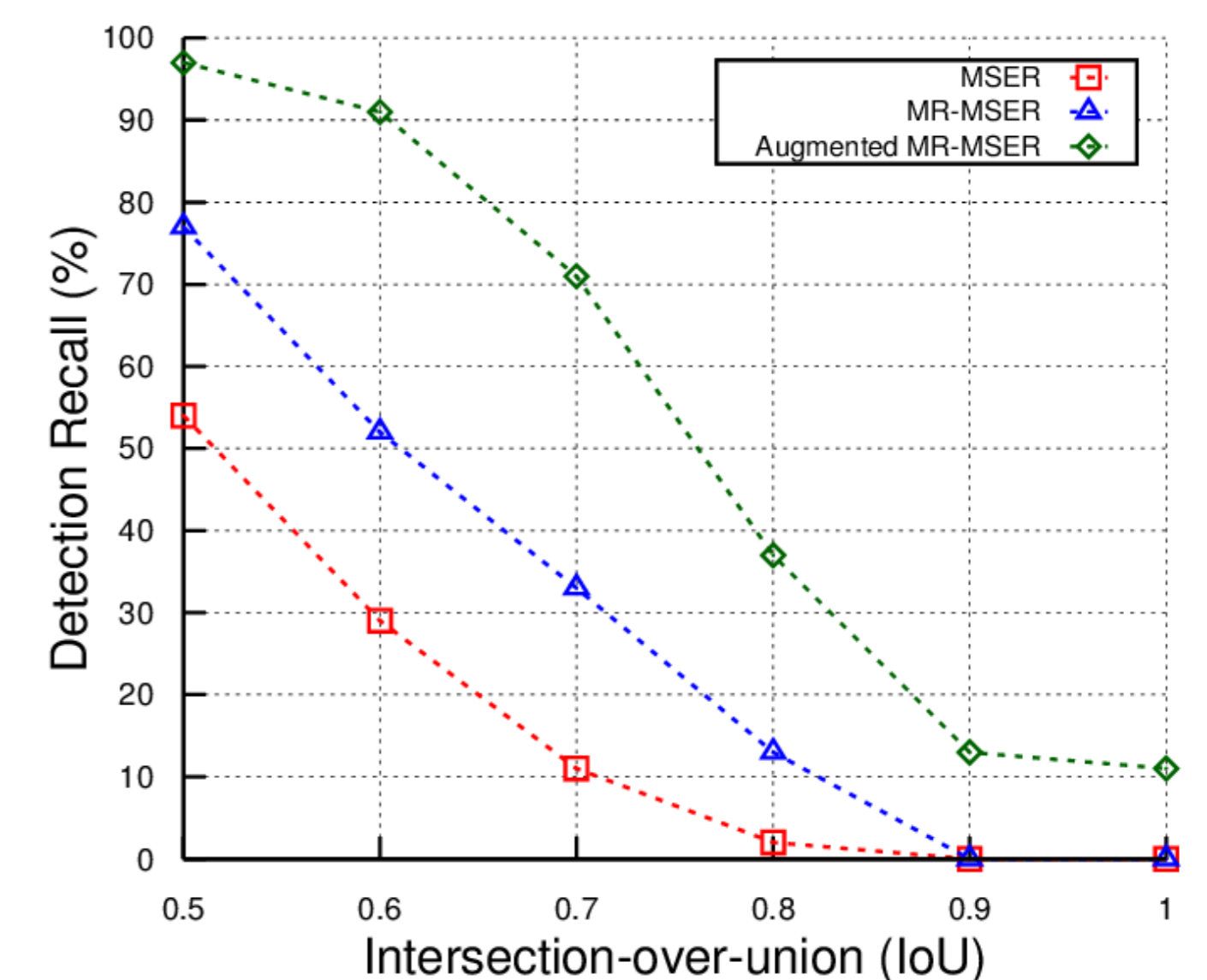
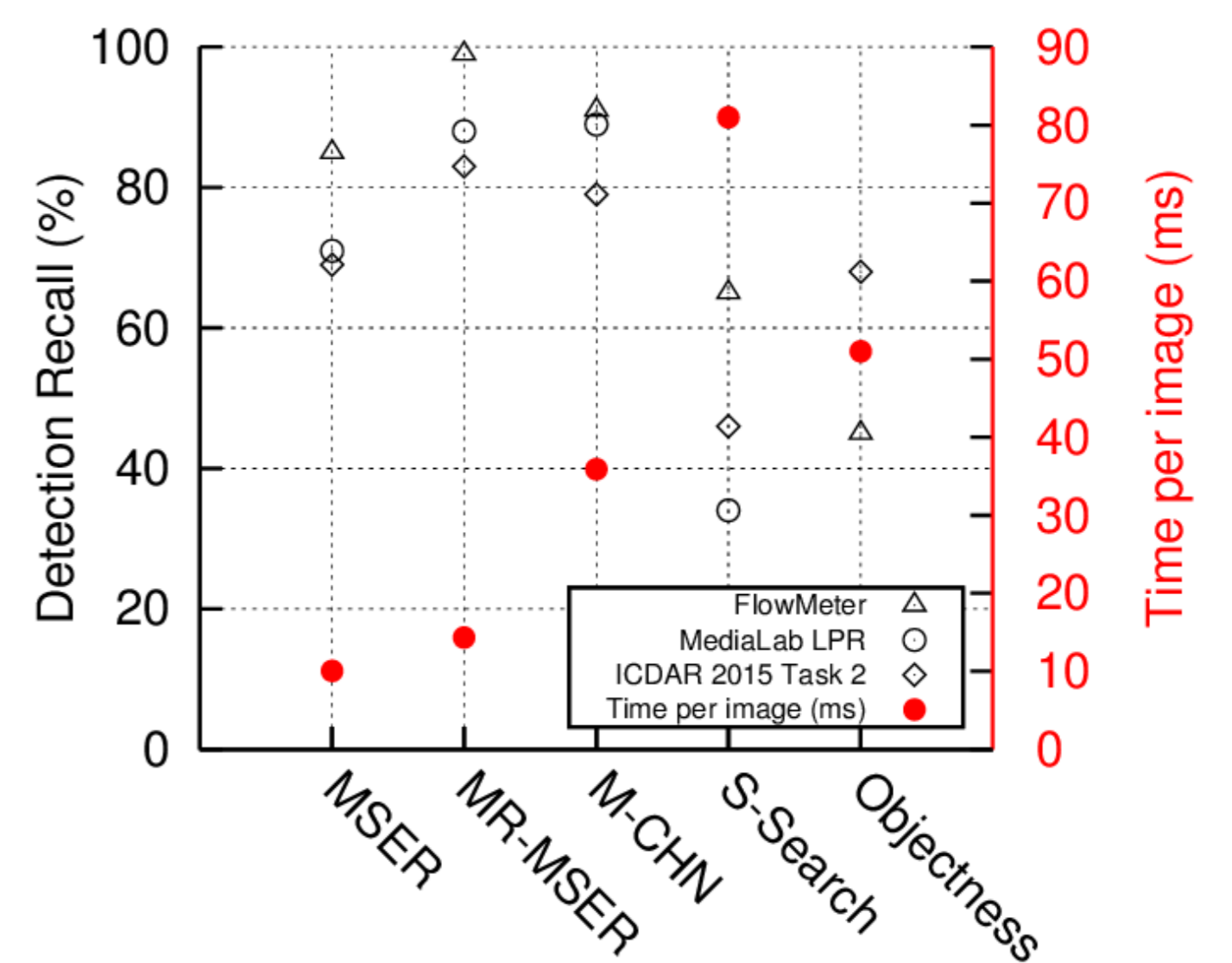


Text Reading - Pipeline

Each aMR-MSER is assigned as score the average intensity of its pixels in the text confidence map. Those having score higher than δ are considered potential regions of text (b). OCR with CNN (c). Non-max Suppression (NMS) over CNN prediction scores (d) to obtain the final readings (e).



MSER vs. MR-MSER vs. aMR-MSER



Results



FlowMeter DB(6052 train, 168910 test images).		
Method	Acc. (%)	Speed (img/s)
Human performance	95.1	0.08
SVM+HOG (2015)	67.4	2.10
Proposed	93.6	12.8
Proposed (no augment)	83.1	12.9

Medialab LPR(288 train, 680 test images).		
Method	Acc. (%)	Speed (img/s)
Human performance	97.2	0.25
Anagnostopoulos <i>et al.</i>	86.0	3.60
Zhu <i>et al.</i>	87.3	9.80
Proposed	90.2	10.0
Proposed (no augment)	83.3	10.4

ICDAR 2015 Task 2(233 train, 233 test images).			
Method	R(%)	P(%)	Hmean (%)
StradVision (2015)	80.2	90.9	85.2
VGGMaxNet_cmb (2015)	77.3	92.2	84.1
ABBYY OCR SDK v10	35.1	61.0	44.5
Proposed	67.0	83.2	74.1
Proposed (no augment)	47.9	82.4	60.5

http://artelab.dicom.uninsubria.it/projects/demos/meter_pipeline/

