Image-based Table Cell Detection

a Novel Table Structure Decomposition Method with New Dataset
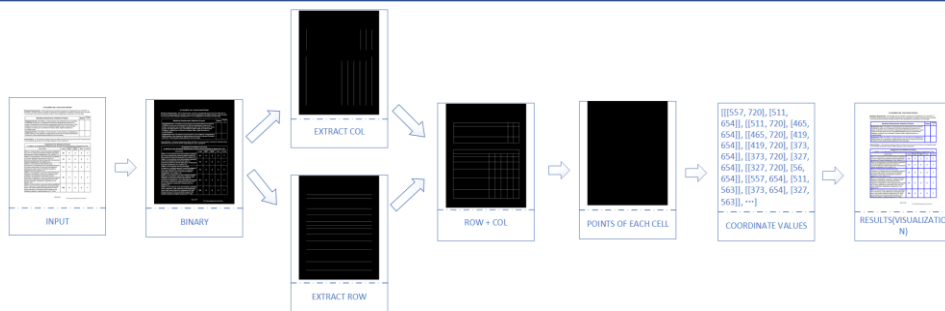
https://github.com/weidafeng/TableCell

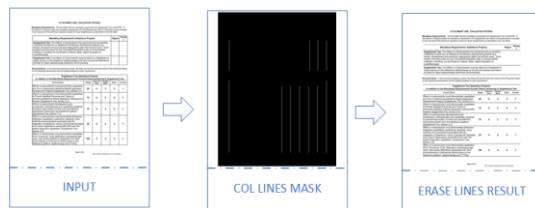Dafeng Wei, Hongtao Lu, Yi Zhou, Kai Chen

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1. How to annotate table cell efficiently or even automatically: TableCell dataset

Automatically extract and annotate table cells

Handle the tables with partial or even no lines

	# images	# cells
Train	3684	122354
Val	1578	47652
Total	5262	170006

TableCell dataset statistics

Electronic sample with partial lines

Scanned sample with complete lines

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2. How to improve the performance of table structure decomposition: Table Projection Module

Whether these blank area belong to a cell? In a global view: consider information about the surrounding area!

Column and row projection example
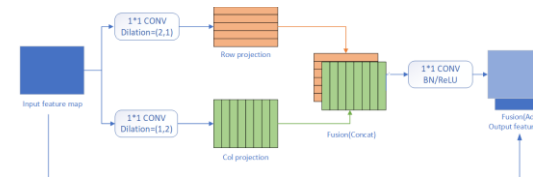
Table Projection Module(TPM)

	TPM	Average Precision					
		AP	AP_0.50	AP_0.75	AP_s	AP_m	AP_l
FCOS		0.776	0.893	0.85	0.69	0.816	0.726
	✓	0.783	0.893	0.852	0.708	0.821	0.73
Mask RCNN		0.828	0.878	0.867	0.758	0.852	0.805
	✓	0.838	0.906	0.886	0.76	0.873	0.788
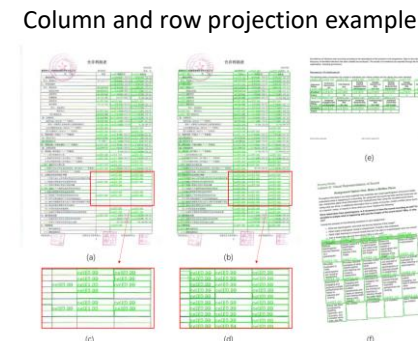
TPM can boost both one-stage and two-stage methods

Qualitative results

	Components					Average Precision					
	TPM	0.25 ratio	OHEM	Focal Loss	Soft-NMS	AP	AP_50	AP_75	AP_s	AP_m	AP_l
Baseline						0.807	0.895	0.874	0.685	0.848	0.777
	✓					0.818	0.895	0.874	0.712	0.858	0.783
Our models	✓	✓				0.833	0.915	0.894	0.685	0.884	0.789
	✓	✓	✓	✓		0.844	0.918	0.907	0.719	0.889	0.797
	✓	✓	✓	✓	✓	0.848	0.918	0.907	0.721	0.894	0.801

Ablation studies on FasterRCNN