

CV homework: document_scanner 代码报告

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1 任务场景概述

拍摄一张 A4 文稿照片，自动完成以下任务流：

角点检测→文档轮廓拟合→ 投影变换（单应性）→ 扫描风格增强

Github:https://github.com/fangzechu/cv_homework1_doc_scanner

2 依赖与环境

详见 requirements.txt

主要包：`opencv-python`、`numpy`

3 方法与原理

流程步骤	采用方法	代码对应
预处理与边缘检测	高斯模糊	cv2.GaussianBlur
	Canny ($\sigma=0.33$)	auto_canny
	形态学闭运算	cv2.dilate/erode
	文档边界与角点定位	cv2.findContours
投影变换	轮廓查找	cv2.findContours
	多边形逼近	cv2.approxPolyDP
	兜底旋转矩形	...
	Shi - Tomasi 角点细化	
扫描风格增强	4 对应点求 H，透视矫正	four_point_transform
流程编排与存储	自适应阈值生成黑白扫描件	enhance_scanned()
	读图、尺度归一	scan_document()

4 代码入口

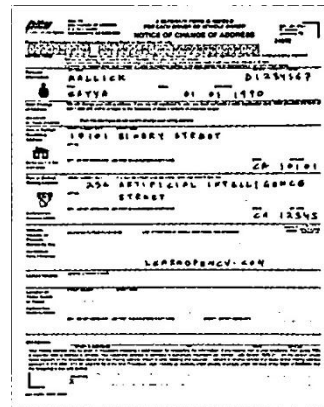
```
color_p, bw_p = scan_document(sample_path, out_dir, debug=True)
```

5 结果说明

输入：原始拍照（透视、旋转、阴影）



中间过程：Edges（Canny）、Corners（四角可视化）、放缩



输出：结果图像

The final processed image of the document, which is a clean, straight, and centered scan of the original photograph. The document is titled "NOTICE OF CHANGE OF ADDRESS" and contains the following information: "MALICK", "SATYA", "01 01 1990", "10101 BINARY STREET", "CA 10101", "256 ARTIFICIAL INTELLIGENCE STREET", "CA 12345", and "LEARNPENCY.COM". The document is a standard form with a header, a body, and a footer.