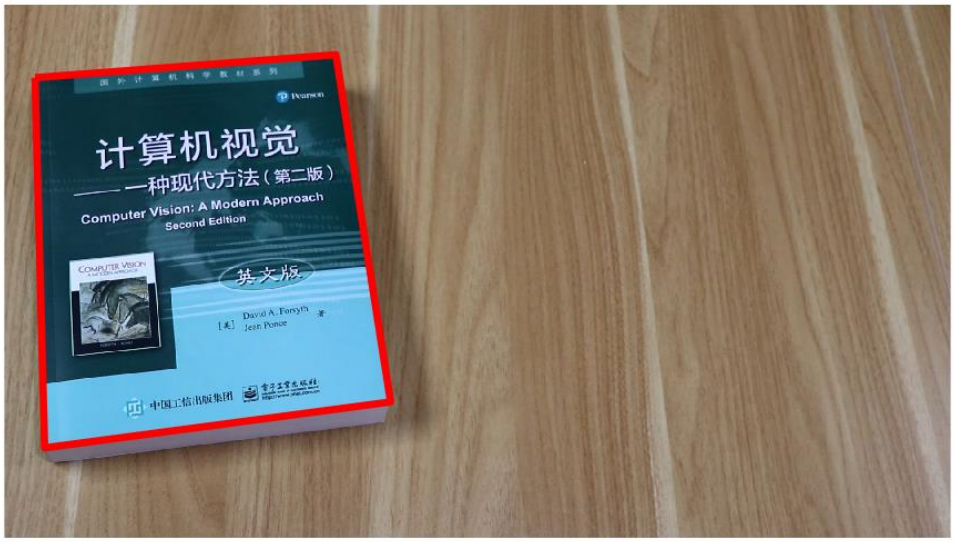
```
clear all;

close all;

% 对第一帧进行标记

video = VideoReader('.\data\targetVideo.MP4');

FrameNum = video.Duration * video.FrameRate;

frame = read(video,1);

X = zeros(4,FrameNum);

Y = zeros(4,FrameNum);

imshow(frame);

[X(:,1),Y(:,1)] = ginput(4);% 顺序为左上、右上、右下和左下

hold on;

plot([X(:,1); X(1,1)],[Y(:,1); Y(1,1)],'r-','LineWidth',5);

hold off;
```

警告：图像太大，无法在屏幕上显示；将以 67% 显示



开始追踪每一帧，并记录变换后的四个角点坐标

```
for i = 1:FrameNum - 1

    frame = read(video,i);

    frameNext = read(video,(i+1));

    points1 = detectSURFFeatures(rgb2gray(frame));

    points2 = detectSURFFeatures(rgb2gray(frameNext));

    [frameFeatures,framePoints] = extractFeatures(rgb2gray(frame),points1);

    [frameNextFeatures,frameNextPoints] = extractFeatures(rgb2gray(frameNext),points2);

    framePairs = matchFeatures(frameFeatures,frameNextFeatures);

    matchedframePoints = framePoints(framePairs(:, 1), :);

    matchedframeNextPoints = frameNextPoints(framePairs(:, 2), :);

    [tform,inlierPtsDistorted,inlierPtsOriginal] = ...

    estimateGeometricTransform(matchedframePoints,matchedframeNextPoints,...

    'affine');

    for j = 1:4

        NewPos = [X(j,i),Y(j,i),1] * tform.T;

        X(j,i+1) = NewPos(1);

        Y(j,i+1) = NewPos(2);

    end

    %imshow(frameNext);hold on;

    %plot([X(:,i+1); X(1,i+1)],[Y(:,i+1); Y(1,i+1)],'r-','LineWidth',5);

    %hold off;

end
```

开始写视频

```
NewVideo = VideoWriter('.\data\newvideo.avi');

NewVideo.FrameRate = video.FrameRate;
```

```
open(NewVideo);

NewBook = imread('.\data\Book.jpg');

[h1,w1,c] = size(NewBook);

xs1 = [1 w1 w1 1]';

ys1 = [1 1 h1 h1]';

for i = 1:FrameNum

    targetFrame = read(video,i);

    [h2,w2,c] = size(targetFrame);

    xs2 = X(:,i);

    ys2 = Y(:,i);

    tform = fitgeotrans([xs1 ys1],[xs2 ys2],'projective');

    I = imwarp(NewBook,tform,'OutputView',imref2d(size(targetFrame)));

    mask = sum(I,3)~=0;

    idx = find(mask);

    NewFrame = targetFrame;

    NewFrame(idx) = I(idx);

    NewFrame(idx+h2*w2) = I(idx+h2*w2);

    NewFrame(idx+2*h2*w2) = I(idx+2*h2*w2);

    writeVideo(NewVideo,NewFrame);

end

close(NewVideo);
```

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