
15EEE337 Digital Image Processing

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Last Lecture

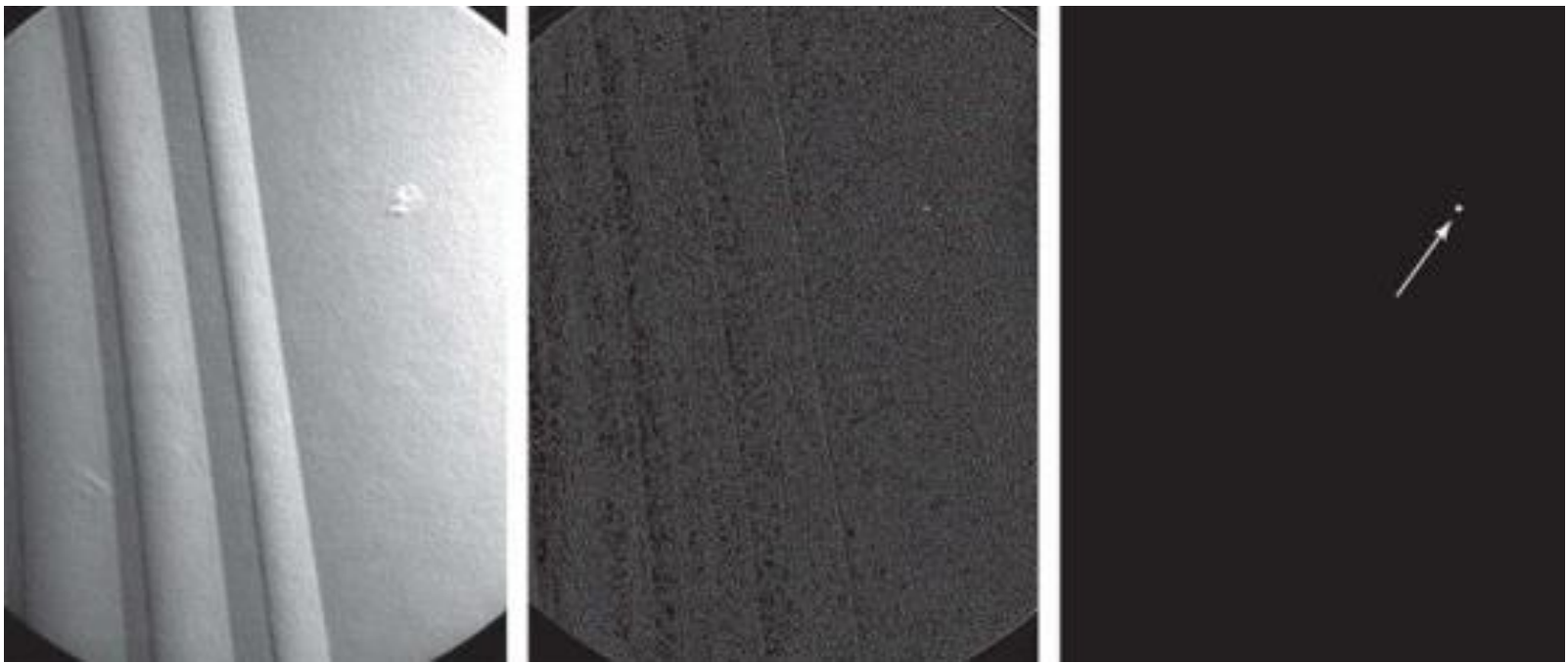
- Segmentation

Detection of Isolated points

- Second order derivatives.
- Isolated point –different from its surroundings
- Intensity wise its different from surroundings
- Use kernel -->
- If the absolute value of the response of the filter at that Point exceed a specific threshold

1	1	1
1	-8	1
1	1	1

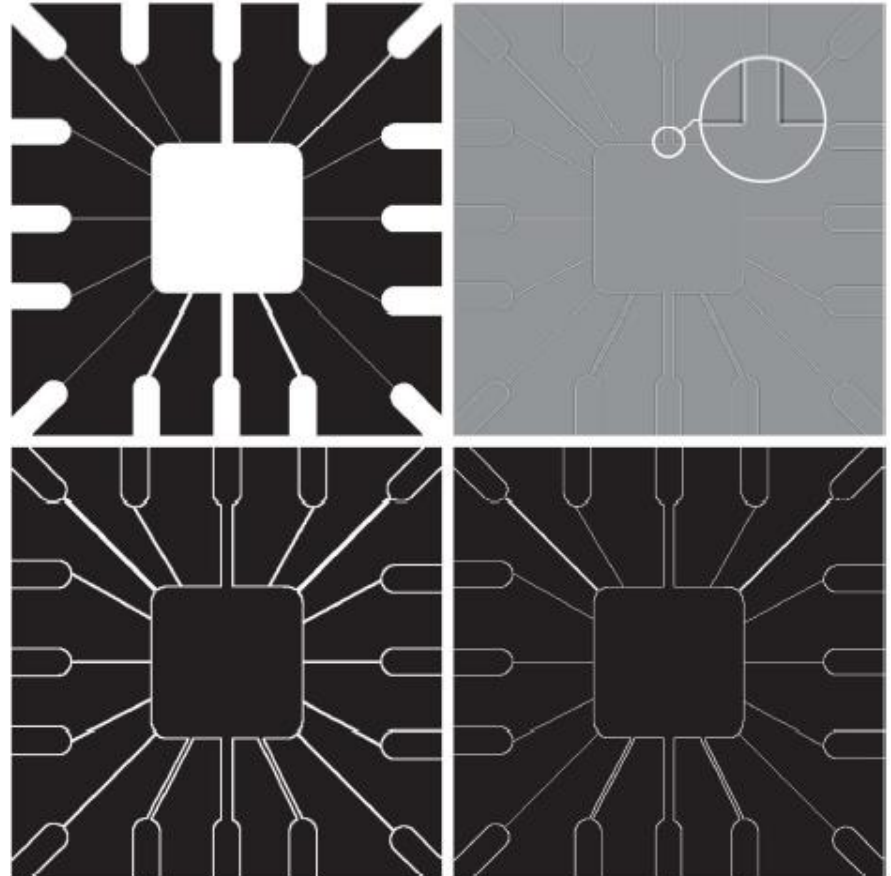
$$g(x,y) = \begin{cases} 1 & \text{if } |Z(x,y)| > T \\ 0 & \text{otherwise} \end{cases}$$



- Threshold 90% of the highest absolute pixel value of image

Line detection

- Second derivatives results in stronger filter response , thinner lines than first derivatives.
- Double line effect
- Absolute value of filtered image
- Positive values of filtered image



-1	-1	-1
2	2	2
-1	-1	-1

Horizontal

2	-1	-1
-1	2	-1
-1	-1	2

+45°

-1	2	-1
-1	2	-1
-1	2	-1

Vertical

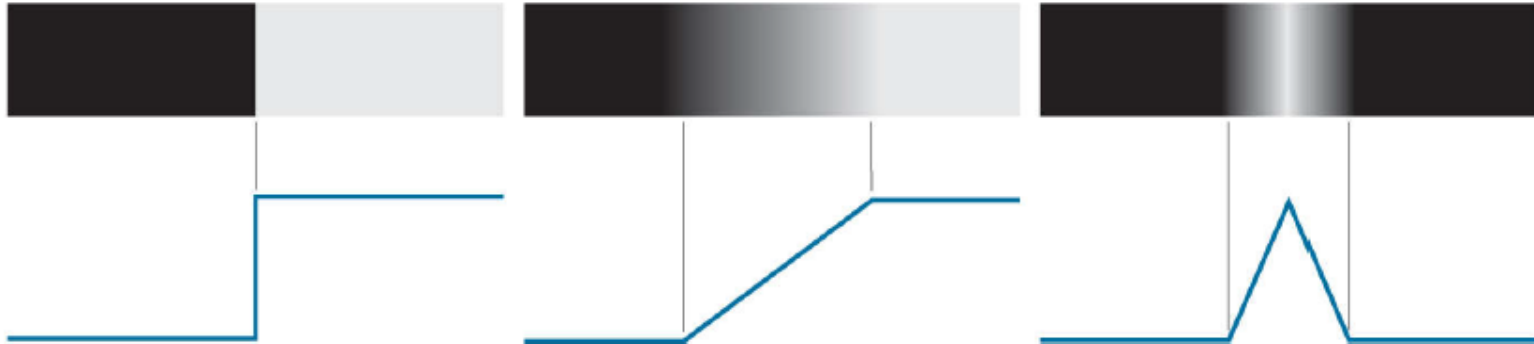
-1	-1	2
-1	2	-1
2	-1	-1

-45°

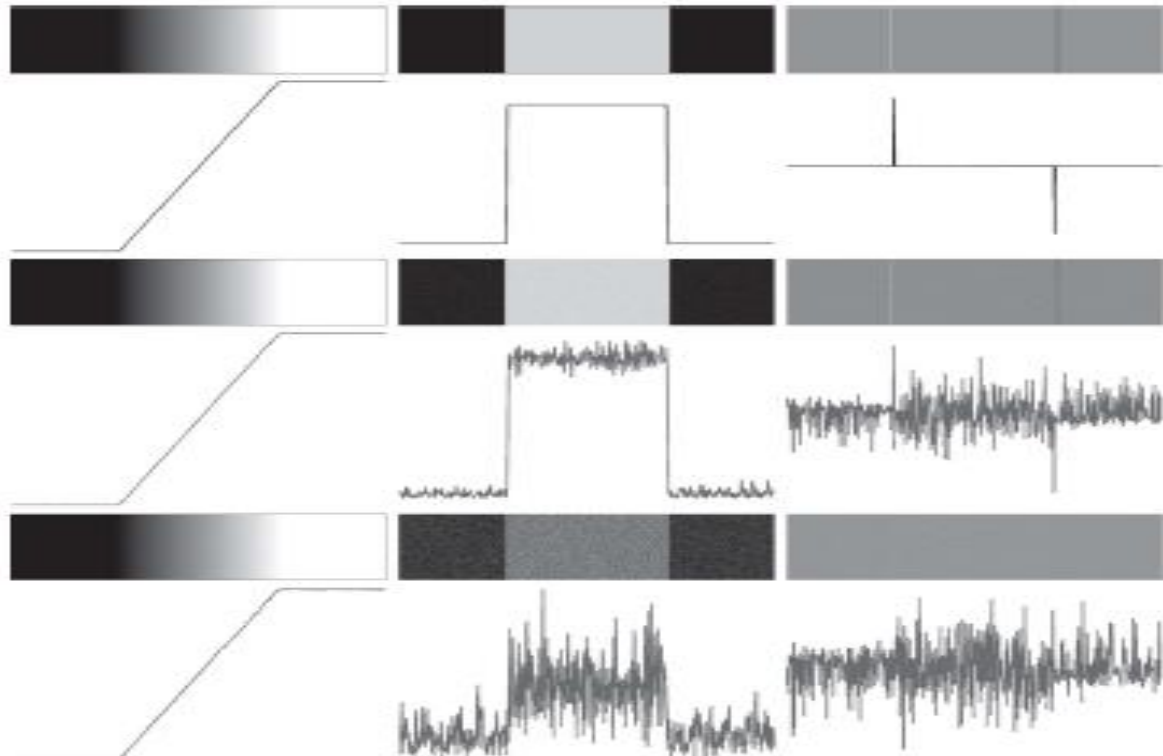
- Detecting lines in specified directions.

Edges

- Frequently used approach
- Abrupt changes in intensity.
- Edge models- intensity profiles.
- Step, ramp, roof edges



Impact of noise on first and second derivative



- The three steps performed typically for edge detection are
 - **Image smoothing for noise reduction**
 - **Detection of edge points**
 - **Edge localization**
-
- Edge detection should yield set of pixels lying **only** on edges
 - Edge detection followed by linking algorithms → meaningful edges or boundaries.

Fitting approach



- Extraneous data
- Incomplete data
- Noise

A graphic featuring the words "THANK YOU" in a stylized, neon-like font. The word "THANK" is rendered in pink, and "YOU" is in light blue. The text is centered and surrounded by several horizontal lines in pink, yellow, and light blue, some of which are slightly offset, creating a sense of motion or depth. The entire graphic is set against a dark, textured background.

THANK
YOU