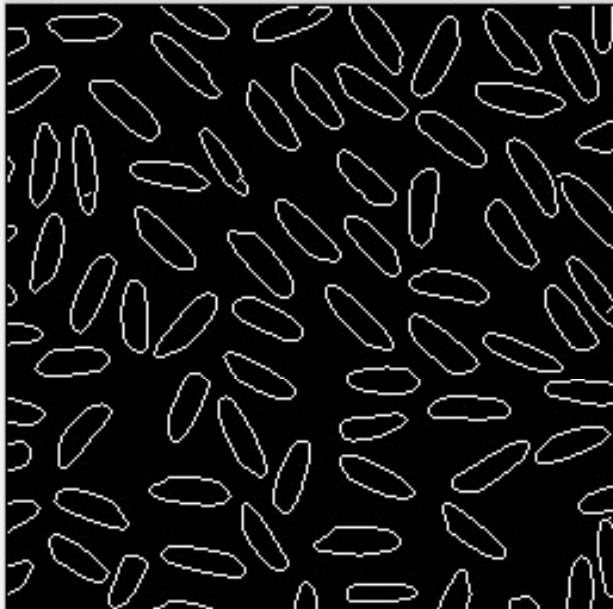Department of Computer Science
University of Bristol

COMS30121 - Image Processing and Computer Vision

www.cs.bris.ac.uk/Teaching/Resources/COMS30121

Seminar Week 05

Segmentation

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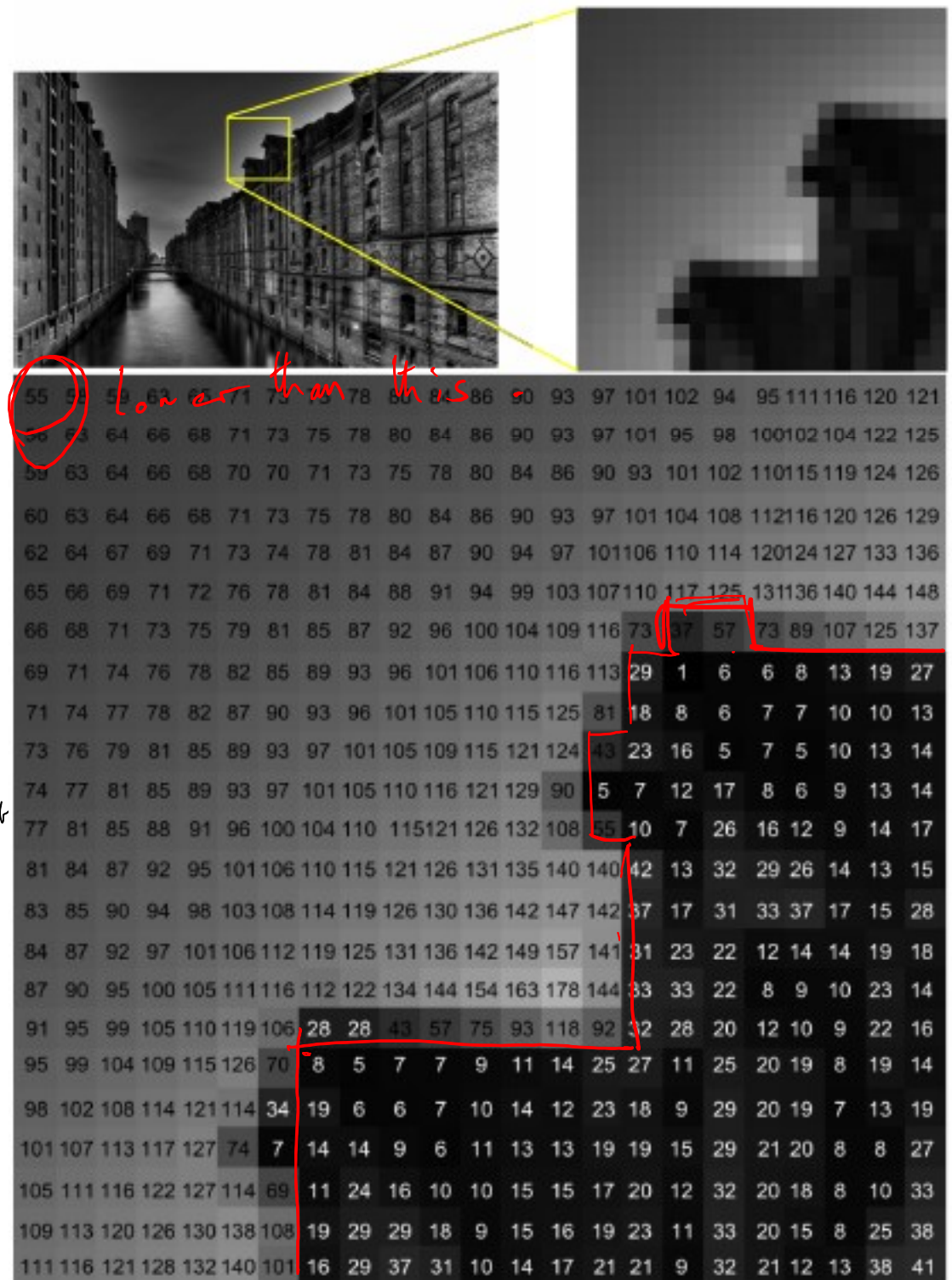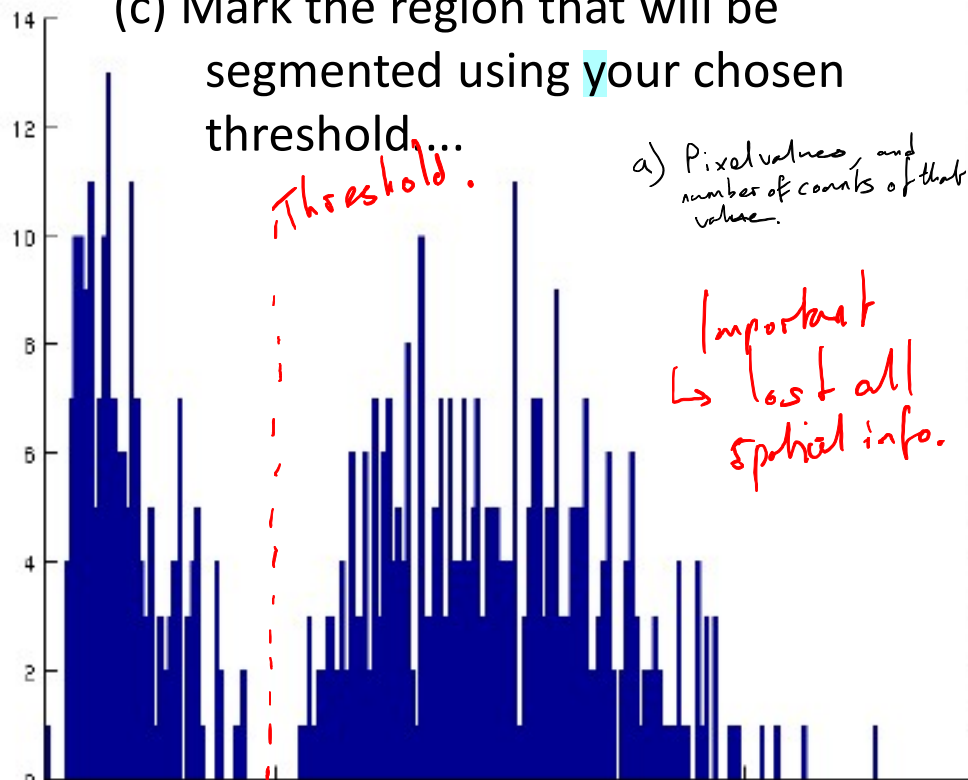Tilo Burghardt | tilo@cs.bris.ac.uk

Consider a 23x23 pixel region (right) and its histogram (bottom left) extracted from the grayscale image (top).

(a) Can you explain how the histogram can be derived from the image and what type information it contains?

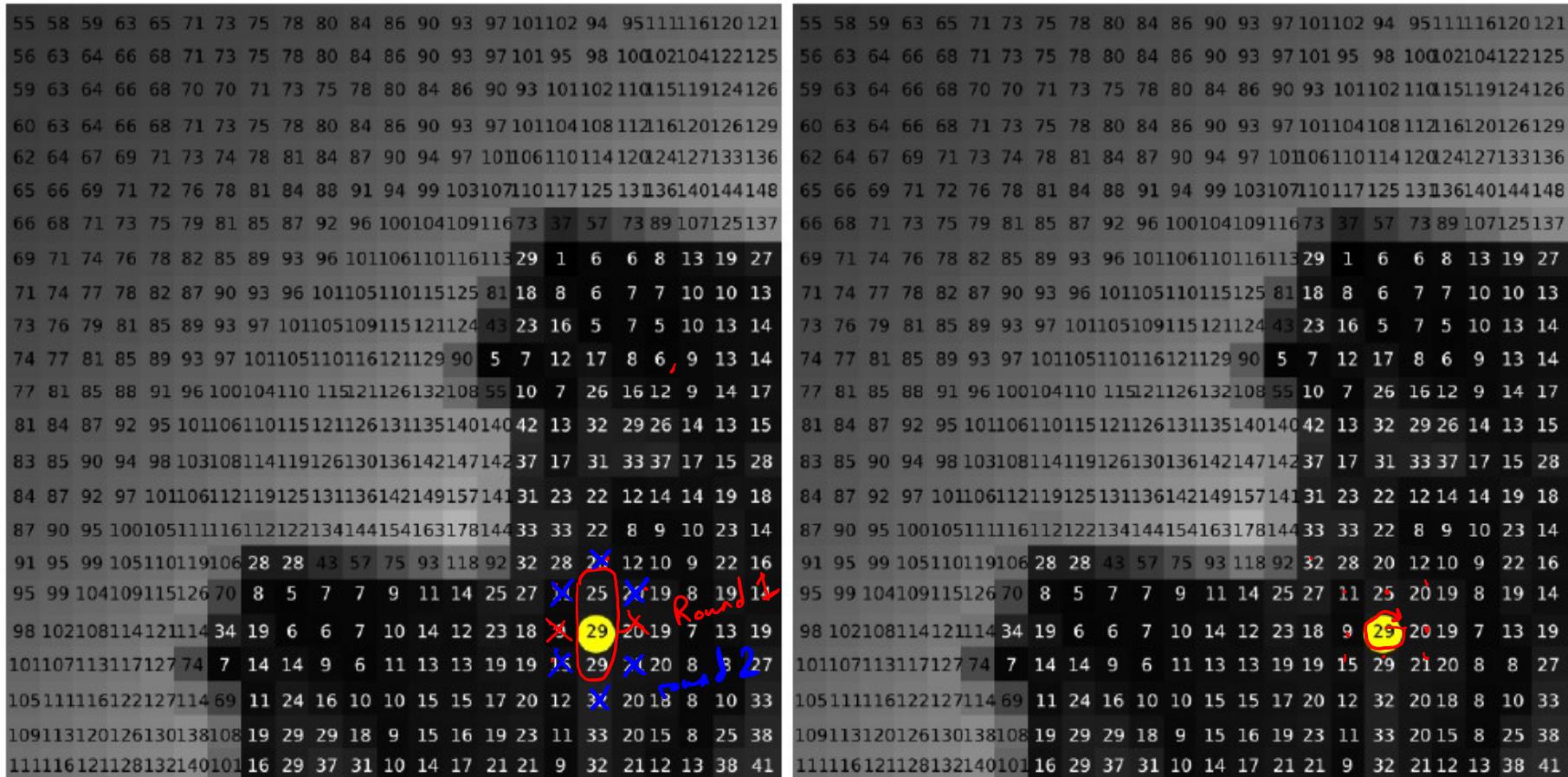(b) Find a threshold that segments the chimneys from the sky in the image?

(c) Mark the region that will be segmented using your chosen threshold....

Threshold.

a) Pixel values, and number of counts of that value.

Important ↳ lost all spatial info.

55	59	63	67	71	74	78	81	86	90	93	97	101	102	94	95	111	116	120	121

lower than this

56	63	64	66	68	71	73	75	78	80	84	86	90	93	97	101	95	98	100	102	104	122	125
59	63	64	66	68	70	70	71	73	75	78	80	84	86	90	93	101	102	110	115	119	124	126
60	63	64	66	68	71	73	75	78	80	84	86	90	93	97	101	104	108	112	116	120	126	129
62	64	67	69	71	73	74	78	81	84	87	90	94	97	101	106	110	114	120	124	127	133	136
65	66	69	71	72	76	78	81	84	88	91	94	99	103	107	110	117	125	131	136	140	144	148
66	68	71	73	75	79	81	85	87	92	96	100	104	109	116	73	37	57	73	89	107	125	137
69	71	74	76	78	82	85	89	93	96	101	106	110	116	113	29	1	6	6	8	13	19	27
71	74	77	78	82	87	90	93	96	101	105	110	115	125	81	18	8	6	7	7	10	10	13
73	76	79	81	85	89	93	97	101	105	109	115	121	124	43	23	16	5	7	5	10	13	14
74	77	81	85	89	93	97	101	105	110	116	121	129	90	5	7	12	17	8	6	9	13	14
77	81	85	88	91	96	100	104	110	115	121	126	132	108	55	10	7	26	16	12	9	14	17
81	84	87	92	95	101	106	110	115	121	126	131	135	140	140	42	13	32	29	26	14	13	15
83	85	90	94	98	103	108	114	119	126	130	136	142	147	142	37	17	31	33	37	17	15	28
84	87	92	97	101	106	112	119	125	131	136	142	149	157	141	31	23	22	12	14	14	19	18
87	90	95	100	105	111	116	112	122	134	144	154	163	178	144	33	33	22	8	9	10	23	14
91	95	99	105	110	119	106	28	28	43	57	75	93	118	92	32	28	20	12	10	9	22	16
95	99	104	109	115	126	70	8	5	7	7	9	11	14	25	27	11	25	20	19	8	19	14
98	102	108	114	121	114	34	19	6	6	7	10	14	12	23	18	9	29	20	19	7	13	19
101	107	113	117	127	74	7	14	14	9	6	11	13	13	19	19	15	29	21	20	8	8	27
105	111	116	122	127	114	69	11	24	16	10	10	15	15	17	20	12	32	20	18	8	10	33
109	113	120	126	130	138	108	19	29	29	18	9	15	16	19	23	11	33	20	15	8	25	38
111	116	121	128	132	140	101	16	29	37	31	10	14	17	21	21	9	32	21	12	13	38	41

Challenge: Region Growing

Given the same image and starting with the marked pixel below, what segmentation can you get using a homogeneity condition that is satisfied if the difference between the pixels in the region together with the query pixel is less than the threshold τ given...

(a) 4-connectivity and τ=5 - encircle the region on the left image
(b) 8-connectivity and τ=40 - encircle the region on the right image