

Some techniques of real-time disparity estimation

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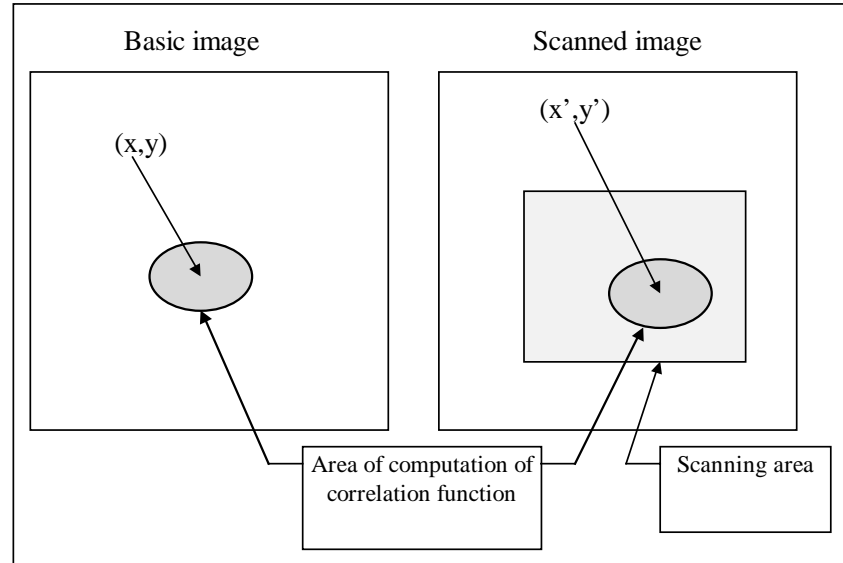
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Basic concepts

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$$L(x, y) = R(x - D_X(x, y), y - D_Y(x, y)) + N(x, y)$$

$$\mathfrak{R}_3 = \sum_{x_i \in \Omega_1, y_i \in \Omega_2} |f(x_i) - g(y_i)|$$

$$(x^\odot, y^\odot) = \arg \max_{(x^\odot, y^\odot) \in \Omega} \tilde{\mathfrak{R}}(\omega_L, \omega_R(x^\odot, y^\odot))$$

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Pyramidal representation

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Checking disparities

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Determining the size of the scanned region.

	12	13	14	15	16	17	18	19	20	21
-3			1							
-2									1	
-1				1	1		1			
0			4	3	8	4		1		1
1			3	20	21	16			1	1
2		4	9	32	38	26	13	4		
3	1	4	19	55	52	40	26			
4		4	17	30	50	15	12	5	2	
5			2	4	7	13	8	4		
6			1	1		2	1			
7						1				
8										

A typical 2D histogram for approximately 600 points

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Calculation of correlation function

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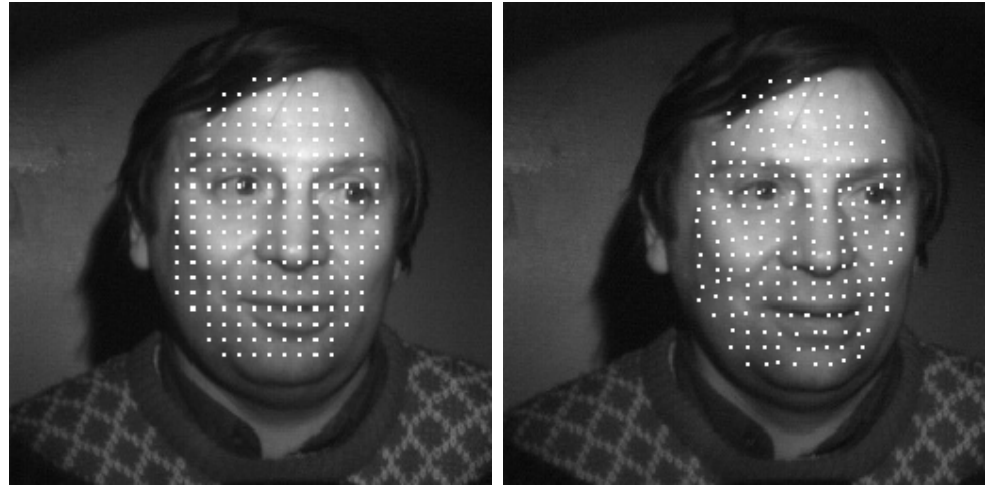
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Finding the minimum of correlation function.

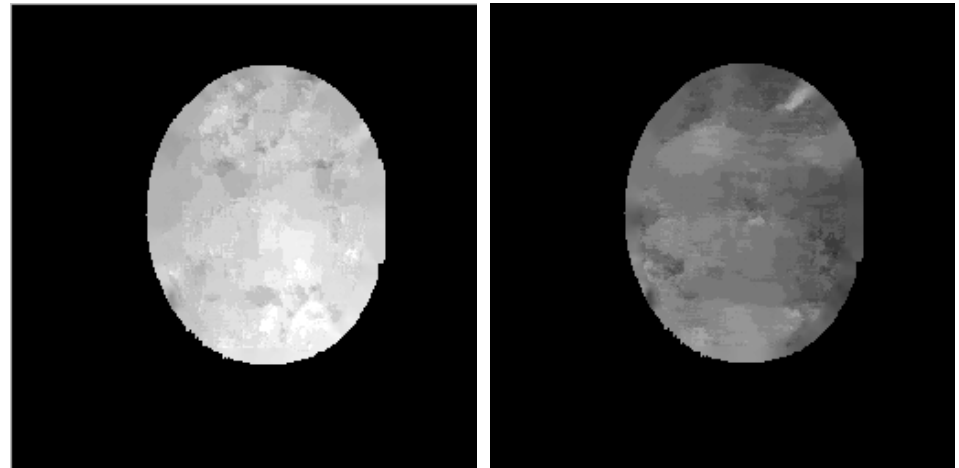
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2 Source images



X- and Y-disparity maps

International Conference Graphicon 1999,
Moscow, Russia, <http://www.graphicon.ru/>