REGISTRATION AND FUSION OF MULTI-SPECTRAL IMAGES USING A NOVEL EDGE DESCRIPTOR

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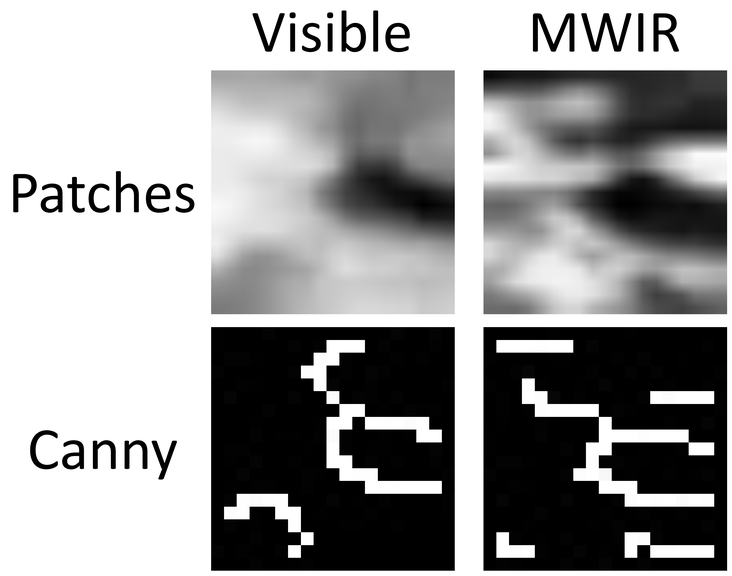
Visible Fusion Mwir

$0.4\mu m - 0.7\mu m$ $3\mu m - 5\mu m$

Multi-spectral registration outline:

1) Corner detection
2) Feature matching by an Edge Descriptor
3) Iterative RANSAC

Invariant Edge Descriptor:



High-Pass Low-Pass image fusion:

1) $LP_w(I) = I * g_w$
2) $HP_w(I) = I - LP_w(I)$

3) $LP_w(F) = \alpha LP_w(V) + (1-\alpha) LP_w(IR)$
4) $HP_w(F) = 1_{|HP_w(V)| \geq |HP_w(IR)|} HP_w(V) + 1_{|HP_w(V)| < |HP_w(IR)|} HP_w(IR)$

5) $F_w = LP_w(F) + gain \times HP_w(F)$
6) $F = \frac{1}{3}F_3 + \frac{1}{3}F_5 + \frac{1}{3}F_7$
7) $F_c = \frac{F}{Y(V)} \cdot V$

Algorithm	VIS-SWIR	VIS-MWIR
Our method	**0.62**	**0.76**
Canny	2.13	1.43
Sobel	3.84	3.2
Mutual Information	1.38	2.48
LGHD	24.1	8.13