

Shape and Moment Invariants Descriptor for Structured Images

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Abstract

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Keywords: image mathching, shape descriptors, moment invariants,

1 Introduction

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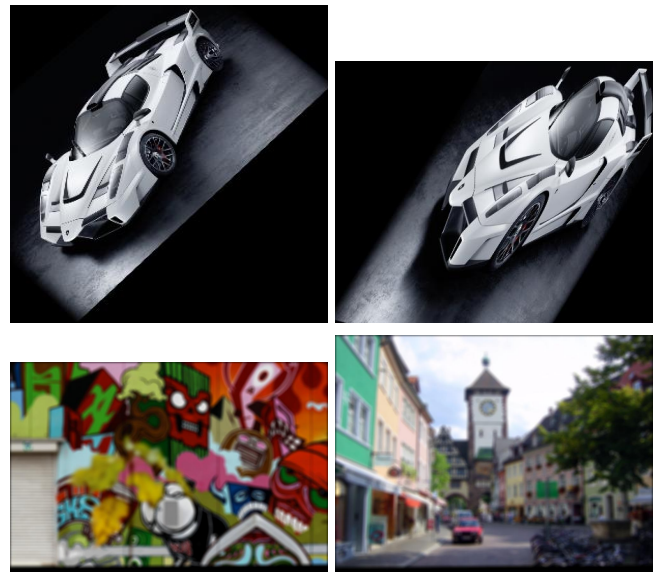
[illegible]

Figure 1: “Is it the same object or scene?” Matching two images under different transformation using local interest regions detected by MSER.

Top image pair (scale and viewpoint): SURF descriptor yields false negative (similarity score 0.096), while the proposed SMI descriptor - true positive (0.89).

Bottom image pair (blur): SURF gives false positive (0.27), while SMI - true negative (-0.11).

[illegible]

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2 Related Work

2.1 Salient region detectors

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Figure 2 shows individual colour channels.



Figure 2: A figure

2.2 Region descriptors

State of the art in region descriptor

3 Image matching with Shape and Moment Invariant descriptor

3.1 Simple shape invariants

3.2 Moment invariants

Consider the variable $x \in \mathbb{R}$,

$$f(x) = x^2 + 2 \quad (1)$$

Equation (1) is a polynomial of order 2.

3.3 Matching

My Paragraph: This is a paragraph.

4 Performance Evaluation

4.1 VGG dataset

The performance results on the VGG dataset are summarized in Table 1.

Det. + descr.	TP	TN	FP	FN	Acc.	Prec.	Recall
MSER + SURF	130	428	4	14	0.968	0.97	0.902
MSER + SMI	122	432	0	22	0.961	1	0.84
BIN + SURF	TP	TN	FP	FN	Acc.	Prec.	Recall
BIN + SMI	112	428	4	32	0.93	0.96	0.77

Table 1: Performance of salient region detectors and descriptors on the VGG dataset.

4.2 OxFrei dataset

The performance results on the VGG dataset are summarized in Table 2.

Det. + descr.	TP	TN	FP	FN	Acc.	Prec.	Recall
MSER + SURF	3303	28926	2826	666	0.9	0.53	0.83
MSER + SMI	2911	31236	516	1058	0.95	0.84	0.73
BIN + SURF	TP	TN	FP	FN	Acc.	Prec.	Recall
BIN + SMI	2155	27840	3912	1814	0.84	0.35	0.54

Table 2: Performance of salient region detectors and descriptors on the OxFrei dataset.

5 Conclusion

A VGG dataset matching results

B OxFrei dataset matching results

References

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