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A Large-Scale Evaluation of Correspondence-Based Coin Classification on Roman Republican Coinage

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1. Motivation

- Ancient coin classification is a challenging task, even for human experts
- Support by automatic image-based method
- Challenges:

Low inter-class variation

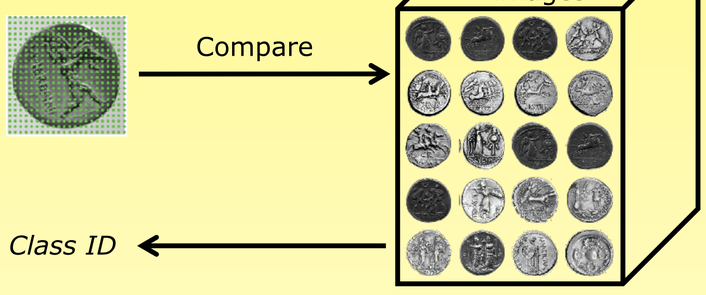
Intra-class variations: non-rigid deformations

Intra-class variations: missing and worn parts

Intra-class variations: illumination changes

2. Related Work

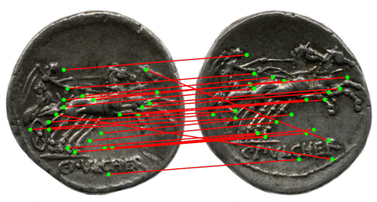
- Learning-based [Ara10, AZK13] and exemplar-based [ZK12, ZKK14] methods
- Exemplar-based methods show superior performance due to lack of large training sets [ZKK14]



Exemplar-based classification

3. Methodology

- We evaluate the top-performing method of [ZKK14] on a large scale dataset
- Goal: investigation of real world practicability
- [ZKK14] is based on the evaluation of local correspondences:

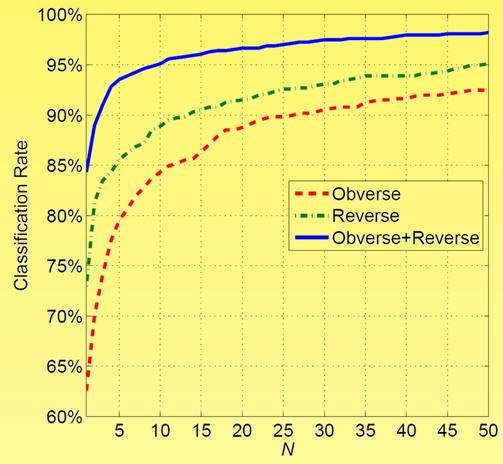


Correspondences to same class

Correspondences to different class

4. Experiments

- **Dataset**: Rom. Rep. coins, 418 classes, 2 images of obv. & rev. side per class



Class. rate for the top *N* classes

Examples: correct class not in the top 50 results

Examples: correct classifications

5. Conclusions

- Adequate scalability: correct class is under top 5 classes in 93.5% of the cases

References

[Ara10] ARANDJELOVIC O.: Automatic attribution of ancient roman imperial coins. In *Proc. of CVPR* (2010), pp.1728–1734.

[AZK13] ANWAR H., ZAMBANINI S., KAMPEL M.: Supporting ancient coin classification by image-based reverse side symbol recognition. In *Proc. of CAIP* (2013), pp. 17–25

[ZK12] ZAMBANINI S., KAMPEL M.: Coarse-to-fine correspondence search for classifying ancient coins. In *ACCV 2012 eHeritage Workshop* (2012), pp. 25–36.

[ZKK14] ZAMBANINI S., KAVELAR A., KAMPEL M.: Classifying ancient coins by local feature matching and pairwise geometric consistency evaluation. In *Proc. of ICPR* (2014).

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