Towards Using Natural Images of Wood to Retrieve Painterly Depictions of the Wood of Christ's Cross

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INSTITUT FÜR REALIENKUNDE DES MITTELALTERS UND DER FRÜHEN NEUZEIT





Depiction of Crucifixion of Jesus





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Art-historical perspective:

- how artists reflected or fictionalised materials through imitation in medieval painting
- how artists made depicted materials productive for the pictorial narrative
- which wood textures were used more frequently than others and why



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Deliver tools for automatic segmentation of big image databases

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This Talk:

Can we use real wood to retrieve painted cross wood?

This Talk: Overview



This Talk: Overview



This Talk: Overview



sort by similarity







0.34



0.25



0.20

- A) Generally feasible to use real wood patches to retrieve painted wood?
- B) Use Painted wood as queries.
- C) Use real images other than wood as queries.

The Data: Paintings



Example Tiles Painted Wood

Example Tiles Painted Non-Wood



The Data: Real Wood



Table: Number of available patches per database and patch size.

#Patches	Patch size [px]		
	64	96	128
REALonline-Wood	1725	448	149
REALonline-Non-Wood	1725	1725	1725
Sharan14	3346	1255	535
Elzaar21	6877	2955	1608
Santos21	8598	3557	1364
	#Patches REALonline-Wood REALonline-Non-Wood Sharan14 Elzaar21 Santos21	#PatchesPa 64REALonline-Wood1725REALonline-Non-Wood1725Sharan143346Elzaar216877Santos218598	#Patches Patch size [64 96 REALonline-Wood 1725 448 REALonline-Non-Wood 1725 1725 Sharan14 3346 1255 Elzaar21 6877 2955 Santos21 8598 3557

- Dense SIFT + Fisher vector encoding (SIFT)
- Binary Statistical Image Features (BSIF)
- Local Phase Quantization (LPQ)
- Rotational Invariant LPQ (RI-LPQ)
- Local Binary Pattern + Histogram (LBP)
- Weber Pattern (WP)
- ResNet50 without last fully connected layer (ResNet)

Experiment A

Experiment A: Use real wood as query to retrieve painted wood



Experiment B: Use painted wood as query to retrieve painted wood



Stone

Water



Examples

Example Tiles





Experiment C: Use real stone/water as query to retrieve painted wood



Summary / Conclusion / Future Work

Conclusion

- Generally employed features could work for this task (shown with "Paint to Paint")
- Using natural images of wood only works to some extent

Future Work

- Overcome domain gap using Image-2-Image translation
- Annotate more data and employ state of the art segmentation networks

Thank You! Q & A

[Extra Slide #1] Results Experiment A 64 px



[Extra Slide #2] Results Experiment A 96 px



[Extra Slide #3] Results Experiment B 64 and 96 px



[Extra Slide #4] Results Experiment C 64px



[Extra Slide #5] Results Experiment C 96px



[Extra Slide #6] Why not train a classifier?



[Extra Slide #7] Material in Paintings Examples







Taken from Material in Paintings Dataset