

Learning Natural Thresholds for Image Ranking

Somayeh Keshavarz, Quang Nhat Tran, Richard Souvenir Computer and Information Sciences Department Temple University

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Classification





Ordinal Classification + Learnable Threshold (OCLET)



Overview of Proposed Method--



Label Discretization



Continuous value labels



Objective Function





Image Ranking Experiments

- Input: Image Sets with real-valued labels
- Task: Ordinal classification with learned thresholds



Scenicness



Age Estimation



Cloudiness





Model	Train Data	1-off 🕇			m-MAE ↓		
		Even	Predef	OCLET	Even	Predef	OCLET
DEX ¹	IMDB-WIKI	69.2	71.6	76.9	1.5	1.6	1.5



Scenicness Estimation





Method	F-score		
Workman et al.[1]	.48		
Workman et al.[1] + OCLET	.53		
OCLET	.54		



[1] S. Workman, R. Souvenir, and N. Jacobs, "Understanding and mapping natural beauty," in Proc. International Conference on Computer Vision, 2017.

Data Distribution

• OCLET learns the same label discretization for different distributions of input data





Initial Thresholds









Summary

- Introduced Ordinal Classification with Learned Thresholds (OCLET)
- OCLET combines ordinal classification with representation learning
- Data-driven approach for label discretization for problems with naturally continuous output
- OCLET can be used for image ranking:
 - o age estimation
 - o scenicness prediction
- OCLET thresholds improve label discretization for regression methods

