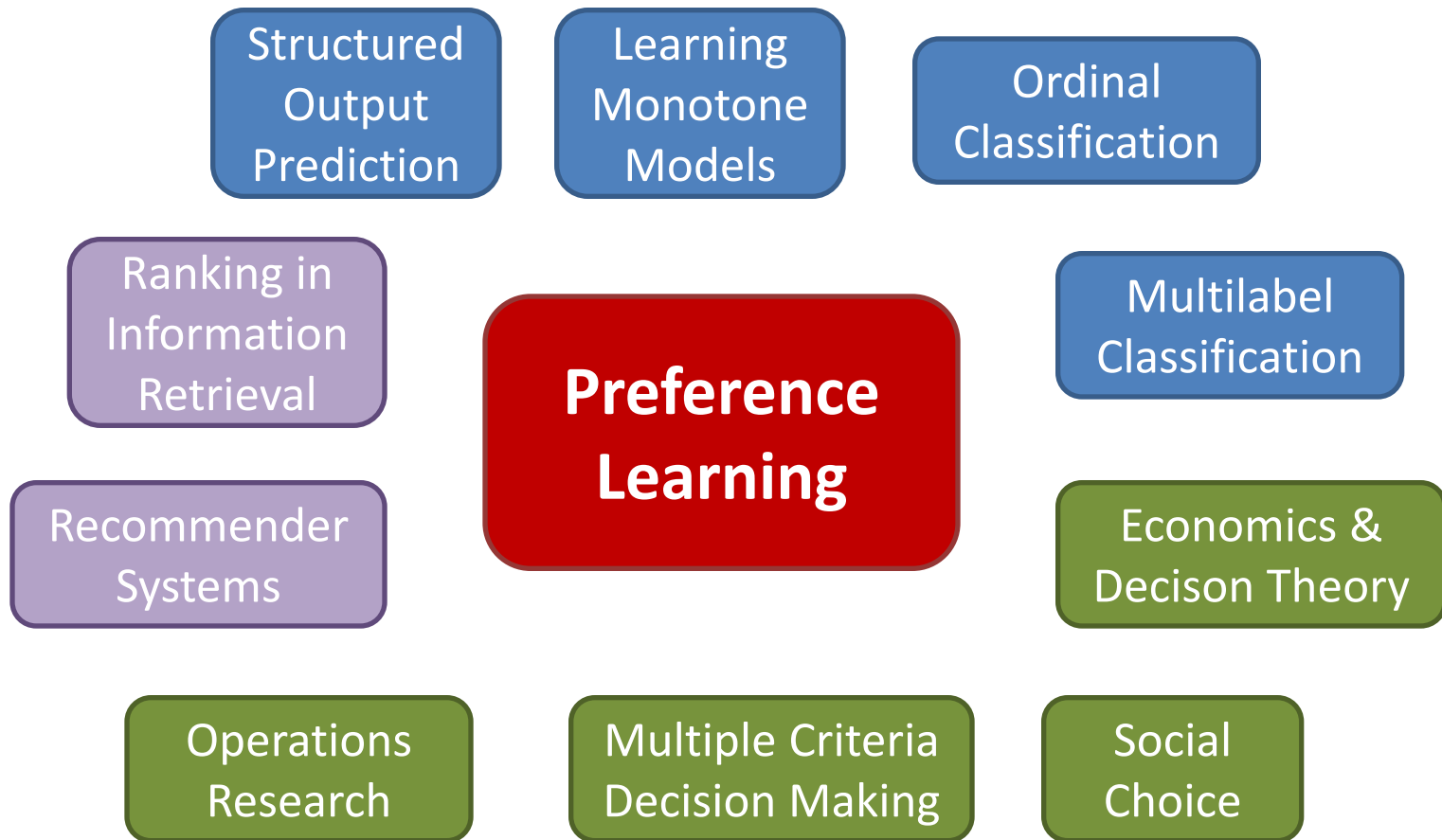

AGENDA

1. Preference Learning Tasks
2. Performance Assessment and Loss Functions
3. Preference Learning Techniques
4. Complexity of Preference Learning
5. **Conclusions**

Conclusions

- Preference learning is an **emerging subfield** of machine learning, with many **applications** and **theoretical challenges**.
- Prediction of **preference models** instead of scalar outputs (like in classification and regression), hitherto with a focus on **rankings**.
- Many existing machine learning problems can be cast in the framework of preference learning (→ preference learning „in a broad sense“)
- **„Qualitative“ alternative** to conventional numerical approaches
 - pairwise comparison instead of numerical evaluation,
 - order relations instead of individual assessment.
- Still many **open problems** (unified framework, predictions more general than rankings, incorporating numerical information, etc.)
- **Interdisciplinary field**, connections to many other areas.

Connections to Other Fields



Edited Book on Preference Learning

Preference Learning: An Introduction

A Preference Optimization based Unifying Framework for Supervised Learning Problems

Part I – Label Ranking

Label Ranking Algorithms: A Survey

Preference Learning and Ranking by Pairwise Comparison

Decision Tree Modeling for Ranking Data

Co-regularized Least-Squares for Label Ranking

Part II – Instance Ranking

A Survey on ROC-Based Ordinal Regression

Ranking Cases with Classification Rules

Part III – Object Ranking

A Survey and Empirical Comparison of Object Ranking Methods

Dimension Reduction for Object Ranking

Learning of Rule Ensembles for Multiple Attribute Ranking Problems

Part IV – Preferences in Multiattribute Domains

Learning Lexicographic Preference Models

Learning Ordinal Preferences on Multiattribute Domains: the Case of CP-nets

Choice-Based Conjoint Analysis: Classification vs. Discrete Choice Models

Learning Aggregation Operators for Preference Modeling

Part V – Preferences in Information Retrieval

Evaluating Search Engine Relevance with Click-Based Metrics

Learning SVM Ranking Function from User Feedback Using Document Metadata and Active Learning in the Biomedical Domain

Part VI – Preferences in Recommender Systems

Learning Preference Models in Recommender Systems

Collaborative Preference Learning

Discerning Relevant Model Features in a Content-Based Collaborative Recommender System



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E. Hüllermeier (eds.)
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includes several introductions
and survey articles



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Preference Learning Website

<http://www.preference-learning.org/>

- Working groups
- Software
- Data Sets
- Workshops
- Tutorials
- Books
- ...