General problem Algorithms	Classification or prediction	Ranking	Recommendation	Correlations discovery	Patterns discovery	Rules discovery	Spatial and spatial-temporal patterns
Clustering	Using distance and dissimilarity functions over standard and hierarchical clusters.		Family of clusterings with regression. Clusters of users used in item-item recommenders.	The clusters provide the correlations.			Basic/fundamental unsupervised learning of spatial-temporal data.
Associative rules finding			By using confidence or leverage measures.	Frequent sets give correlations.	Frequent sets over list of lists of tags.	Find frequent sets, then derive rules using different conditional probabilities measures.	Applied to sequences of tagged events.
Prefix trees	Probabilities of reaching leafs and internal end nodes.	The probabilities of the leafs and internal end nodes can be seen as ranks.	By using probabilities of reaching leafs and internal end nodes. The non-end nodes of paths can be recommended.		Sequences of tags from histories can be seen as words. E.g. sequences of road network graph edges can be seen as words.	Bayesian rules can be derived following the paths from the leafs to the root.	Over appropriate systems of tags. For example, travel routes seen as sequences of segments in a road network graph.
Decision trees and forests	Classifiers are robust on missing and wrong data.			By construction decision trees give correlations.		By construction decision trees give predicates for rules.	Combined with prefix trees gives great results.
Naive Bayesian classifier	Easy to program. NBC's need tuning.			By examination of the cartesian products of the observed variables.		By construction Bayesian rules are given with the classifier functions.	Probability rules for patterns can be found using appropriate tagging and class labels.
Dimension reduction			As a preliminary step. Great for fuzzy clusters discovery.	The axes in the reduced dimension give the correlations between the axes in the original dimension.	SVD over centralized matrices. NNMF over matrices from bag of words models.		SVD and NNMF over numerical data arrays with appropriate tag systems.
Markov chains	N-grams	Stationary probabilities for random walks in graphs using adjacency matrices.	By making graphs from history of interaction and using dynamic ranking.			Hidden Markov chain models.	Applied to sequences of tagged events.