Statistics > Machine Learning

Visualizing and Interacting with Concept Hierarchies

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(Submitted on 11 Mar 2013)

Concept Hierarchies and Formal Concept Analysis are theoretically well grounded and largely experimented methods. They rely on line diagrams called Galois lattices for visualizing and analysing object-attribute sets. Galois lattices are visually seducing and conceptually rich for experts. However they present important drawbacks due to their concept oriented overall structure: analysing what they show is difficult for non experts, navigation is cumbersome, interaction is poor, and scalability is a deep bottleneck for visual interpretation even for experts. In this paper we introduce semantic probes as a means to overcome many of these problems and extend usability and application possibilities of traditional FCA visualization methods. Semantic probes are visual user centred objects which extract and organize reduced Galois sub-hierarchies. They are simpler, clearer, and they provide a better navigation support through a rich set of interaction possibilities. Since probe driven sub-hierarchies are limited to users focus, scalability is under control and interpretation is facilitated. After some successful experiments, several applications are being developed with the remaining problem of finding a compromise between simplicity and conceptual expressivity.

Subjects: **Machine Learning (stat.ML)**
Cite as: **arXiv:1303.2488 [stat.ML]**
(or **arXiv:1303.2488v1 [stat.ML]** for this version)

Submission history

From: Michel Plantie [view email]
[v1] Mon, 11 Mar 2013 11:20:23 GMT (804kb,D)

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