

**Algorithm Learning****Learning Set, Multiset, and Scalar Filters**

Perhaps the simplest action one can do on a dataset is filtration, and it is of our research interest to be able to discover the filtering rule (the *filter*) that has been applied from the output of such an action. For the more straightforward filters one could recognize the challenge as a classification problem. In general, though, we are not in much luck – it appears as if that the more complex the operations and criteria forming the filter, the more difficult it is to discover the rule when comparing the results to the inputs.

This project is concerned with a restriction of the filter learning problem to sets, multisets, and simple scalars. In other words, we would like to be able to name the filter that had been used when processing simple sets and multisets of numbers or immutable strings, with some reasonable level of confidence.

**Structure**

The following three problems would ideally all be solved in the project:

1. identification of filters based on set membership;
2. learning of filters based on element multiplicity in multisets;
3. reconstruction of filters based on order, suprema, and infima criteria.

Who is this for? Bachelor's or master's students interested in approaching the problem at hand. Statistical, neural, and optimisation approaches are all welcome.

Interested? Please reach out to us for more details.

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