**SolrClassification**

**Lucene Document Classification Integration**

⚠️ Solr6.1

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**Introduction**

This documentation is about the integration of the Lucene Classification module with Solr to allow Solr users to easily manage simple Classification problems out of the box.

**Solr Classification**

The classification in Solr can happen 2 sides:
Indexing time - through an Update Request Processor
Query Time - through a Request handler (similar to the More like This)
This documentation is about Indexing time integration:
The Classification Update Request Processor.

**Classification Update Request Processor**

First of all let's describe some basic concepts:
An Update Request Processor Chain, associated to an Update handler, is a pipeline of Update processors, that will be executed in sequence. It takes in input the added Document (to be indexed) and return the document after it has been processed by all the processors in the chain in sequence. Finally the document is indexed. An Update Request Processor is the unit of processing of a chain, it takes in input a Document and operates some processing before it is passed to the following processor in the chain if any.

The main reason for the Update processor is to add intermediate processing steps that can enrich, modify and possibly filter documents, before they are indexed. It is important because the processor has a view of the entire Document, so it can operate on all the fields the Document is composed.

**Description**

The Classification Update Request Processor is a simple processor that will automatically classify a document (the classification will be based on the latest index available) adding a new field containing the class, before the document is indexed. After an initial valuable index has been built with human assigned labels to the documents, thanks to this Update Request Processor will be possible to ingest documents with automatically assigned classes. The processing steps are quite simple:
When a document to be indexed enters the Update Processor Chain, and arrives to the Classification step, this sequence of operations will be executed:
The latest Index Reader is retrieved from the latest opened Searcher
A Lucene Document Classifier is instantiated with the config parameters in the solrconfig.xml
A Class is assigned by the classifier taking in consideration all the relevant fields from the input document
A new field is added to the original Document, with the class
The Document goes through the next processing step

**Configuration**

Let's see the detailed configuration for the Update Processor with examples:

**e.g.**

K Nearest Neighbours Classifier

```xml
<updateRequestProcessorChain name="classification">
  <processor class="solr.ClassificationUpdateProcessorFactory">
    <str name="inputFields">title^1.5, content, author</str>
    <str name="classField">cat</str>
    <str name="algorithm">knn</str>
    <str name="knn.k">20</str>
    <str name="knn.minTf">1</str>
    <str name="knn.minDf">5</str>
  </processor>
</updateRequestProcessorChain>
```
Simple Naive Bayes Classifier
<updateRequestProcessorChain name="classification">
<processor class="solr.ClassificationUpdateProcessorFactory">
<str name="inputFields">title^1.5, content, author</str>
<str name="classField">cat</str>
<str name="algorithm">bayes</str>
</processor>
</updateRequestProcessorChain>

Usage
Indexing News Documents? we can use the already indexed news with category, to automatically tag upcoming stories with no human intervention. E-commerce Search System? Category assignation will require few human interaction after a valid initial corpus of products has been indexed with manually assigned category. The possible usage for this Update Request Processor are countless. In any scenario where we have documents with a class or category manually assigned in our Search System, the automatic Classification can be a perfect fit. Leveraging the existent Index , the overhead for the Classification processing will be minimal. After an initial human effort to have a good corpus of classified Documents, the Search System will be able to automatically index the class for the upcoming Documents. Of course we must remember that for advanced classification scenarios that require in deep tuning, this solution can be not optimal.