

New Perspectives in Autonomic Design Patterns for Stream-Classification-Systems

P. Dazzi, F. Nidito, M. Pasquali

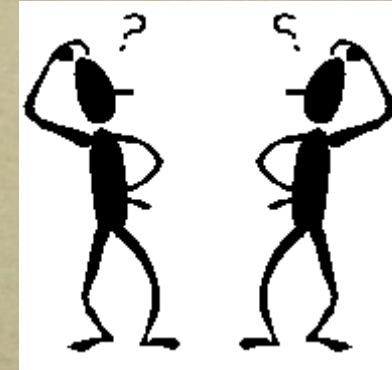
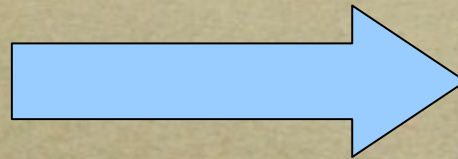
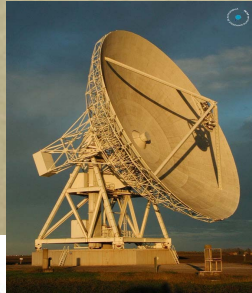
<http://www.di.unipi.it/~pasquali>



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Motivations



How can we optimize our system?



The autonomic systems sense their operating environment and automatically take action to change the environment or their own behaviour

We propose a design pattern that can be easily exploited by the *stream-classification-systems* designer to achieve autonomicity with a minimal effort.

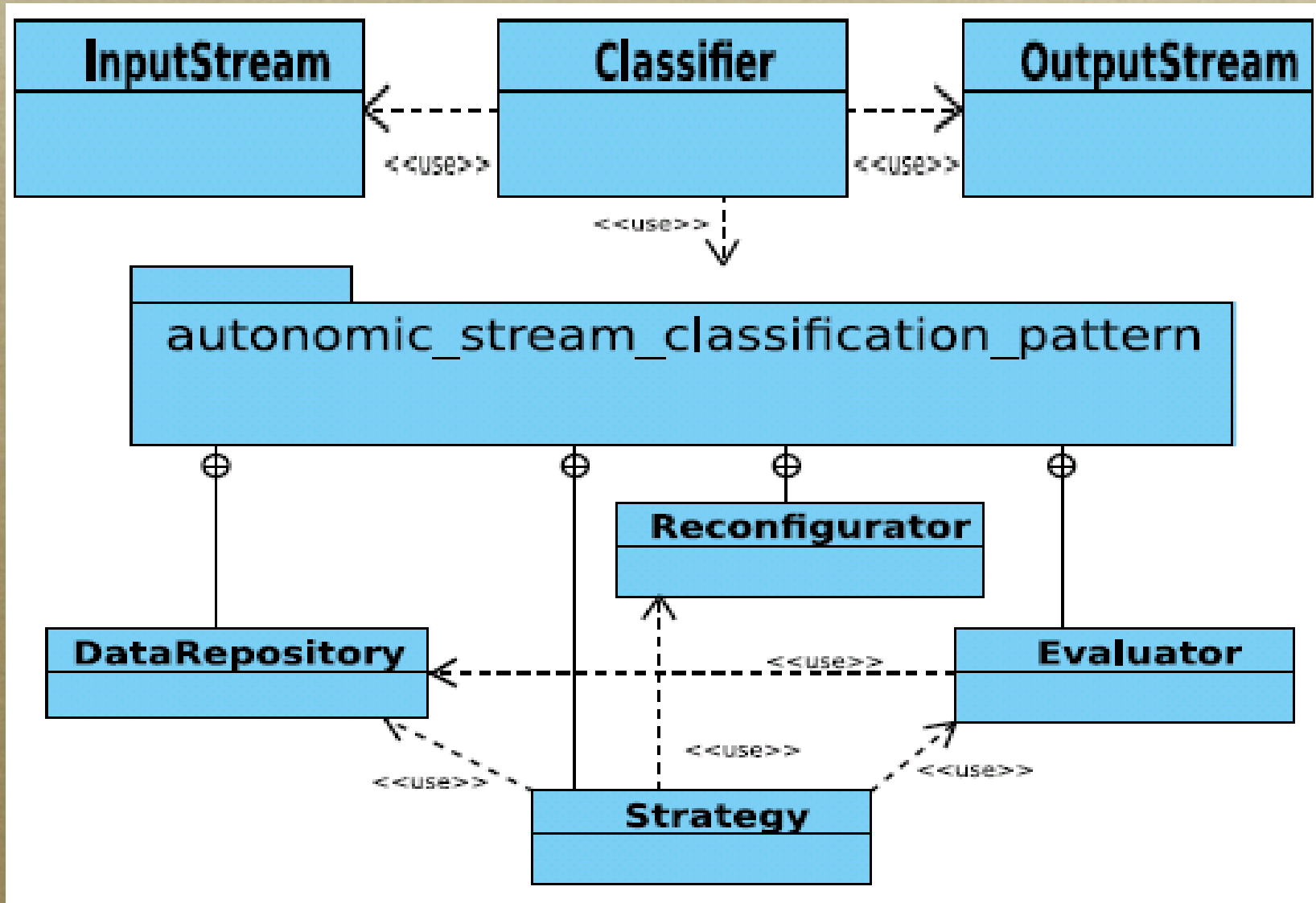
STREAM-CLASSIFICATION-SYSTEMS



Examples:

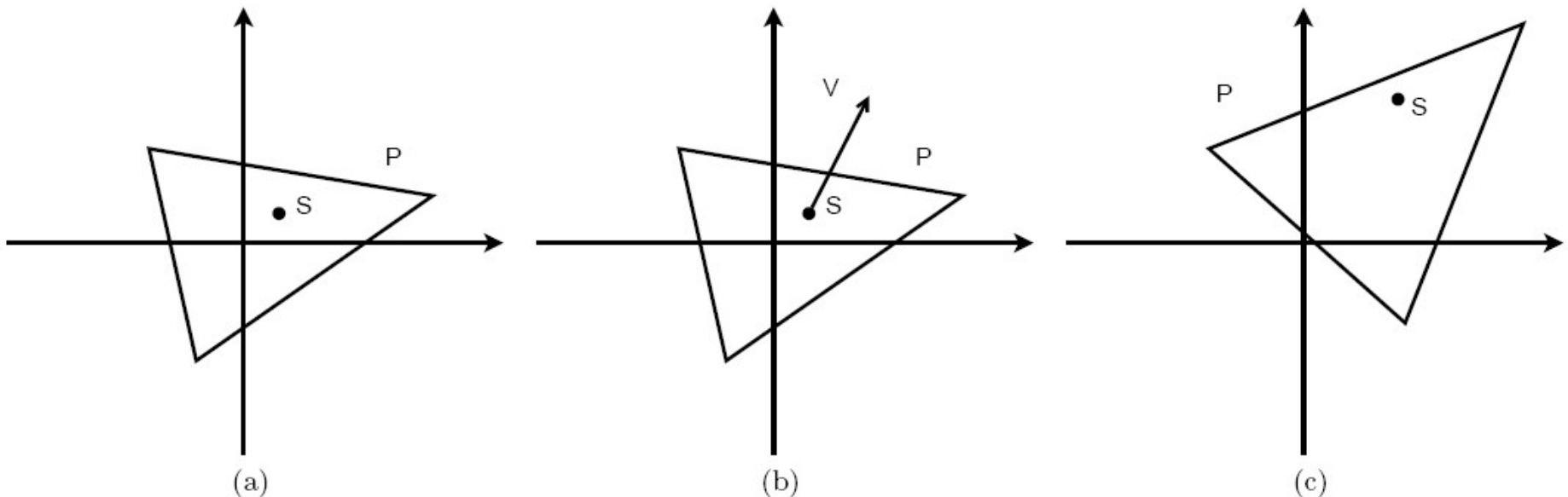
- Traffic shaper
- Scheduling
-

AUTONOMIC DESIGN PATTERN FOR STREAM-CLASSIFICATION-SYSTEMS



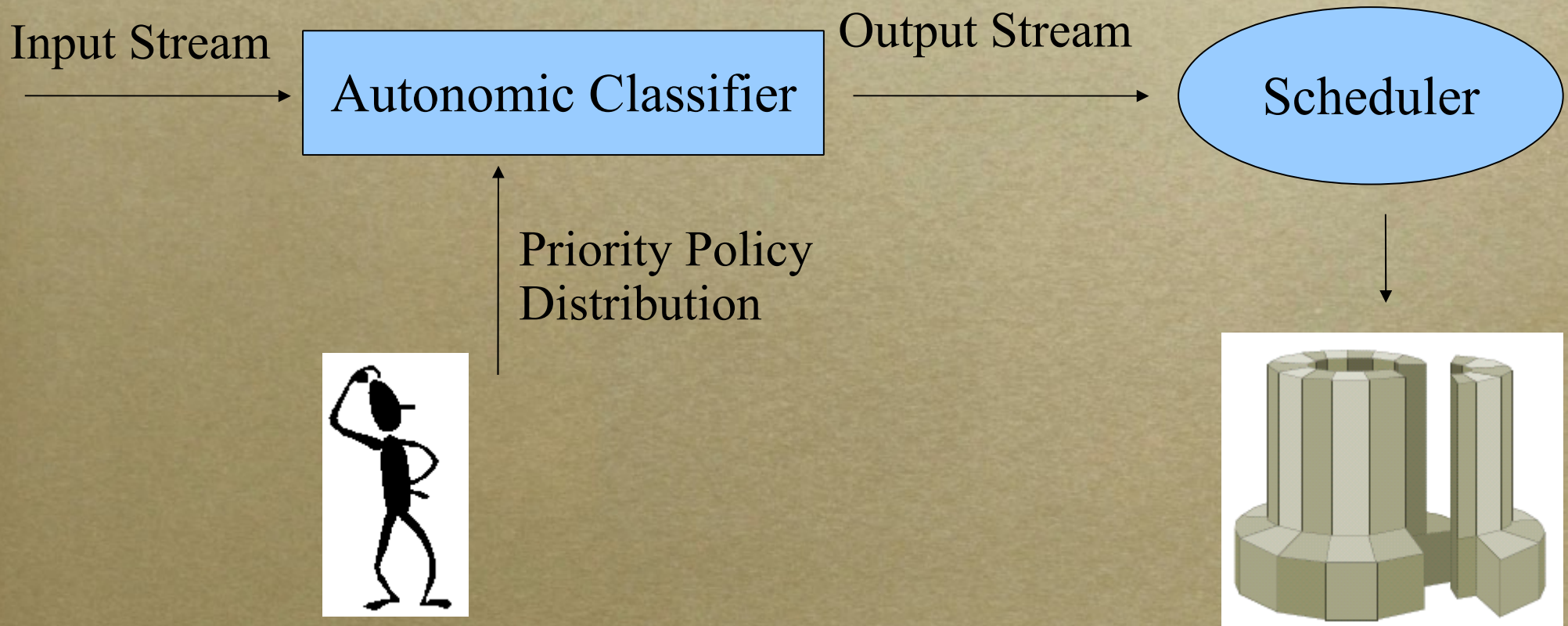
Polytope

A *polytope* consists in a particular subset of the possible values returned by an *Evaluator* invocation. When a *Evaluator* invocation returns a value belonging to the polytope the reconfiguration step is not performed.



Proof of concept

We propose an autonomic classification heuristics that can be used in online job classifiers for a scheduling system.



Proof of concept [1]

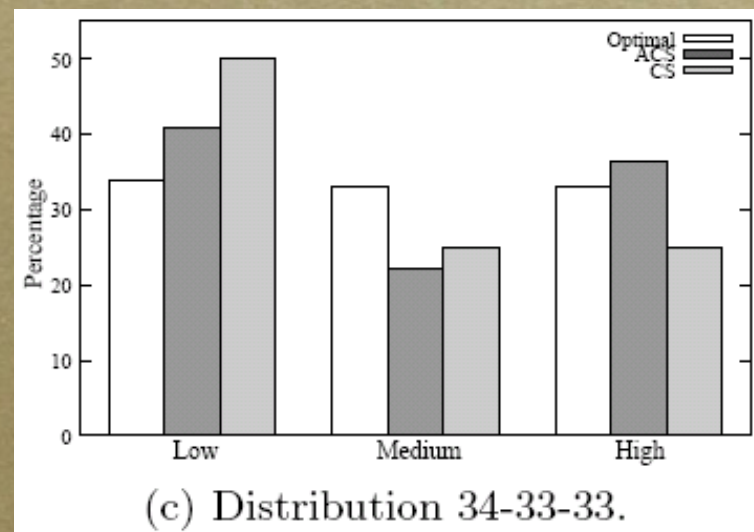
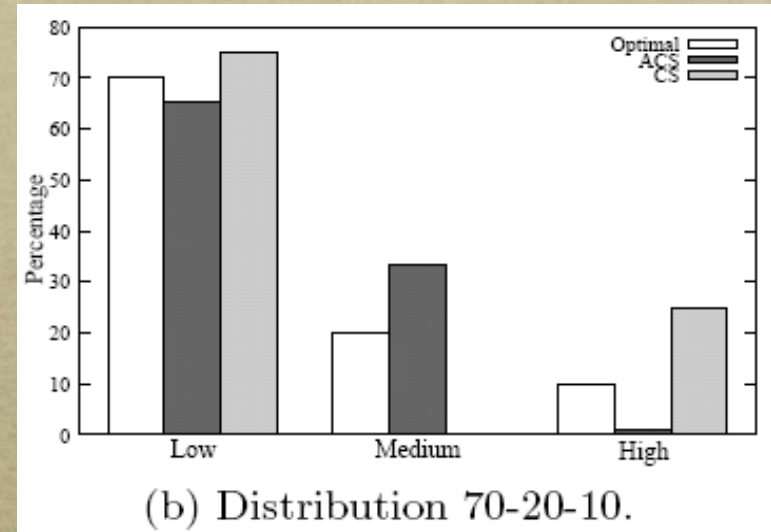
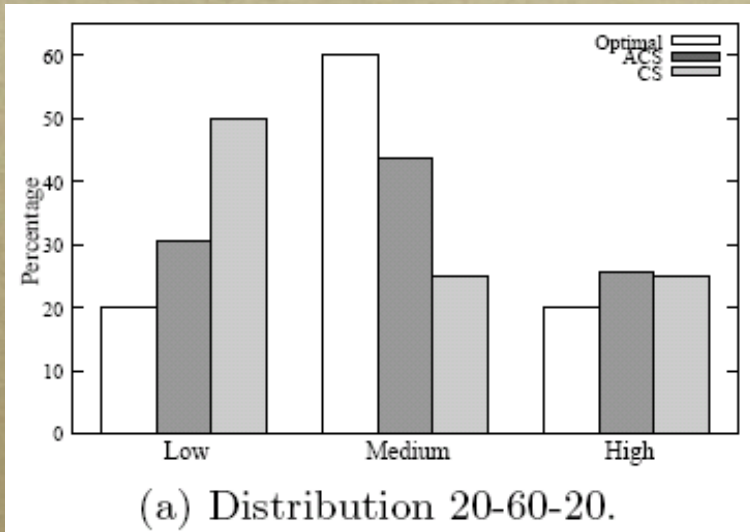
Our classification heuristics is based on general job parameter called X

If X has low variability the Not-Autonomic classifier is able to reach the given classification distribution

If X has high variability the Not-Autonomic classifier is **NOT** able to reach the given classification distribution

#Jobs	Minimum	Maximum
1250	0	1000
1250	2500	3000
1250	0	500
1250	4500	5000

Proof of concept [2]



Conclusions & Future Works

- We presented a pattern easing the design and the implementation of autonomic Stream-Classification-Systems.

An interesting direction for future research concerns meta-programming and Aspect Oriented Programming:



code transformation tools that, starting from a set of high level specification, are able to generate the code needed to provide autonomic behaviour to certain class of systems.

Questions ???

