

LSST Filters from Dynamic Context

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Filter from Dynamic Context

Scientific context is constantly changing, modules which depend on the context are needed.

The modules (filters and science values) need to be near input LSST/ZTF stream, in the broker, but the context can be updated from elsewhere.

Certain platforms, such as **Online Data Analysis (ODA) with INTEGRAL Science Data Center** to fetch known transients, and yield (basic) templates.

The science value / filter is to be derived in Fink in stages:

- 1 upload time+locations, download parametric optical templates (possibly trivial), with ranges, per event class
- 2 match templates, produce (normalized) relevance ranks per class
- 3 filter outputs per class

In this context, in some cases, the optical templates can be trivial (e.g. "decaying"), so that only the location/time is matched.

Scientific Targets

target	update rate	event source
Prompt GRB	1/day	GCN/VOEvent
Prompt GRB, other impulsive transients	10/day	sub-threshold, REST INTEGRAL, Fermi
X-ray-SNe, FBOT, AT2018cow-like	1/day	REST
unidentified X-ray sources (Swift, INTEGRAL, etc)	100/day	GCN, REST
pointing directions, planning, scheduling	1/day	ESA, ESO, REST
FRB	1/month	GCN/VOEvent
neutrino	1/month	GCN/VOEvent
GW	1/week	GCN/VOEvent
human-written reports NLP	1/day	GCN Circ/ATel

We will be able to similarly work with events from eXTP, THESEUS, Athena, etc.

Science values and filters

Added Science Values:

best-relevance	relevance to any transient
class-relevance	relevance to transient class

Corresponding Filters:

has-associations	relevant to any transient
class-associations	relevant transient in a given class

Plans and Schedule

<https://github.com/volodymyrss/fink-science/tree/fink-dynamic-filters>

Done so far:

- 1 deployed local K8s installation of Fink, integrated with ODA
- 2 made test values/filters, made test runs for performance verification

To do next:

- 1 Provide Fink k8s/charts (for easy testing) and ODA Transient k8s/charts (for OpenSaaS)
- 2 Investigate performance of the filters