Converters and graphical representation for BioModels Database

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EMBL-EBI

Initial situation

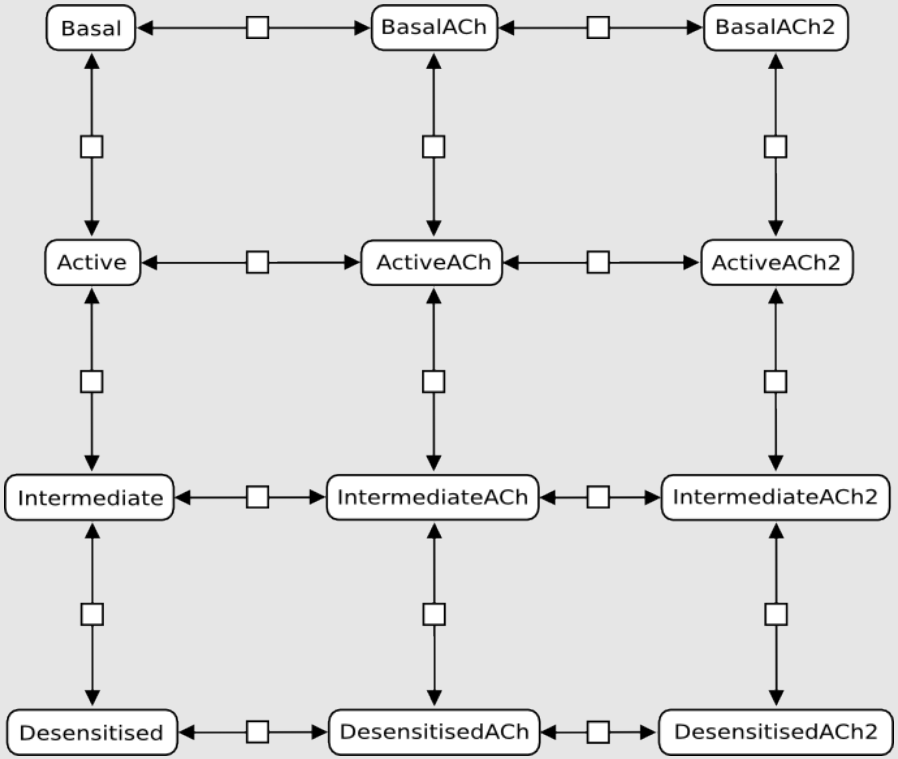
Model converted into DOT

```
digraph g {
        node [shape=plaintext]
        A1 -> B1
        A2 -> B2
        A3 -> B3

        A1 -> A2 [label=f]
        A2 -> A3 [label=g]
        B2 -> B3 [label="g'"]
        B1 -> B3 [label="(g o f)'" tailport=s headport=s]

        { rank=same; A1 A2 A3 }
        { rank=same; B1 B2 B3 }
}
```

Automatic layout with graphViz



Problems

1. Graphs are inaccurate:
   - Shapes and arcs do not have any particular meaning

2. Graph layouts are unefficient:
   - Important number of nodes and arcs
   - Highlighting biological interests

3. Display of SBML metadata is forgotten

Problems

1. Graphs are inaccurate:
   - Shapes and arcs do not have any particular meaning

Convert SBML models into SBGN representations

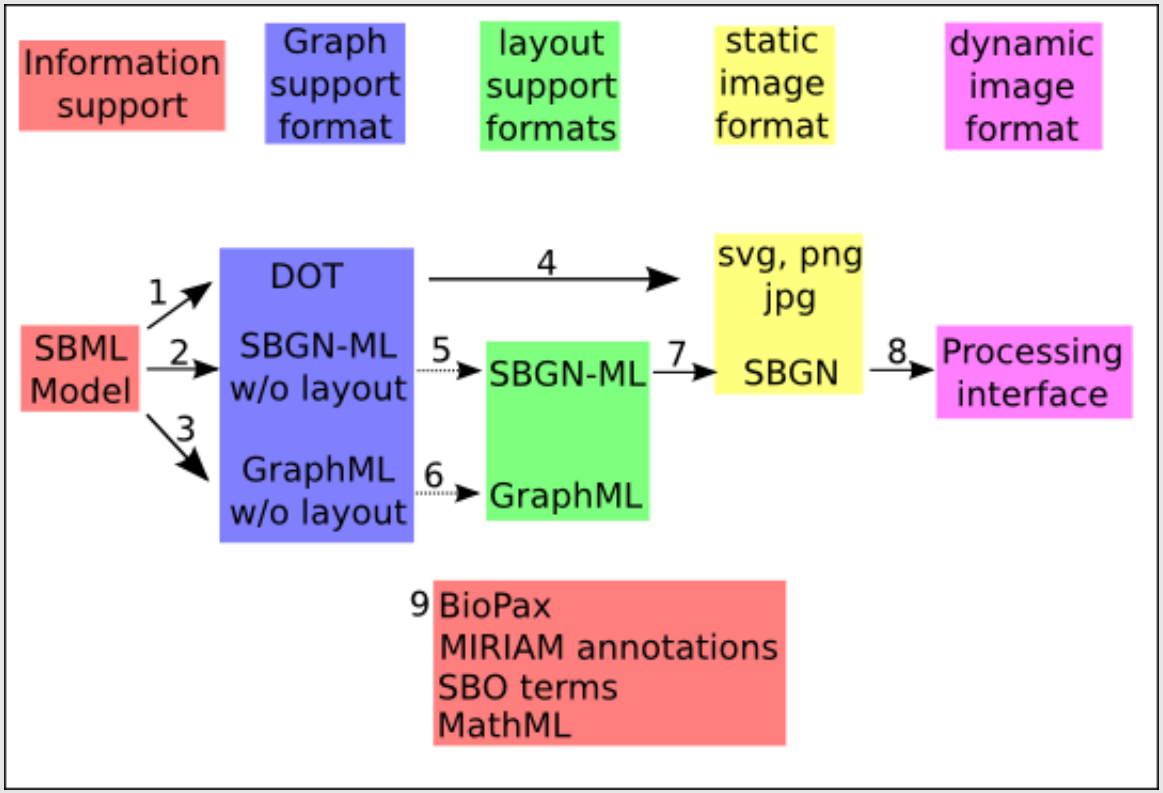
2. Graph layouts are unefficient:
   - Important number of nodes and arcs
   - Highlighting biological interests

Implement specific algorithms for SBGN

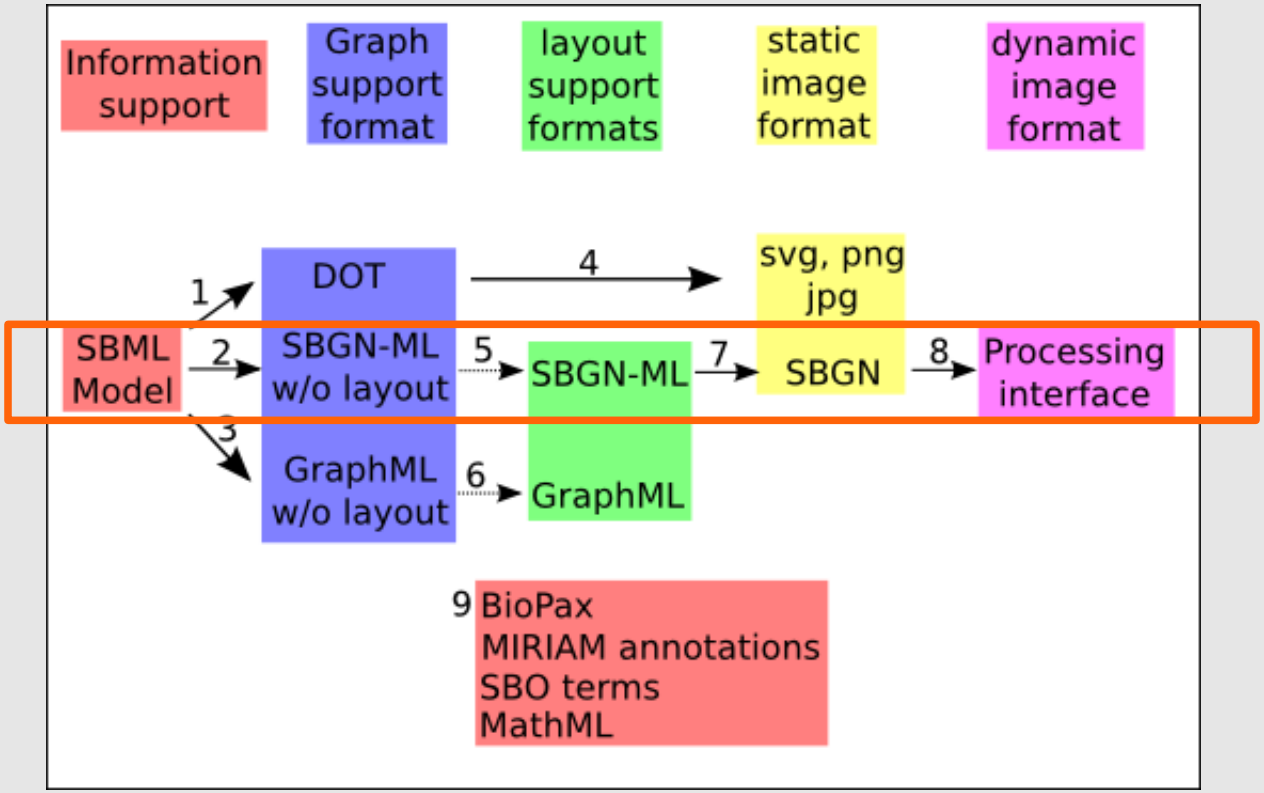
3. Display of SBML metadata is forgotten

Enriching model conversions with MIRIAM annotations, SBO terms, MathML...

Pipeline of converters



Pipeline of converters



SBML to SBGN-ML

Conversion properties:

- More **accurate** with MIRIAM annotations and SBO terms
- **Independent mapping** to SBGN classes into other formats
- Use **extension** tag of milestone 2 to support SBML metadata
- Identify SBGN **clones**
- Identify **complexes** and their **decorations**

SBGN representation

Processing

- Software open source, GNU license
- Designed for graphical and visualization of data
- processing.js 1.2.3 / processing 1.5

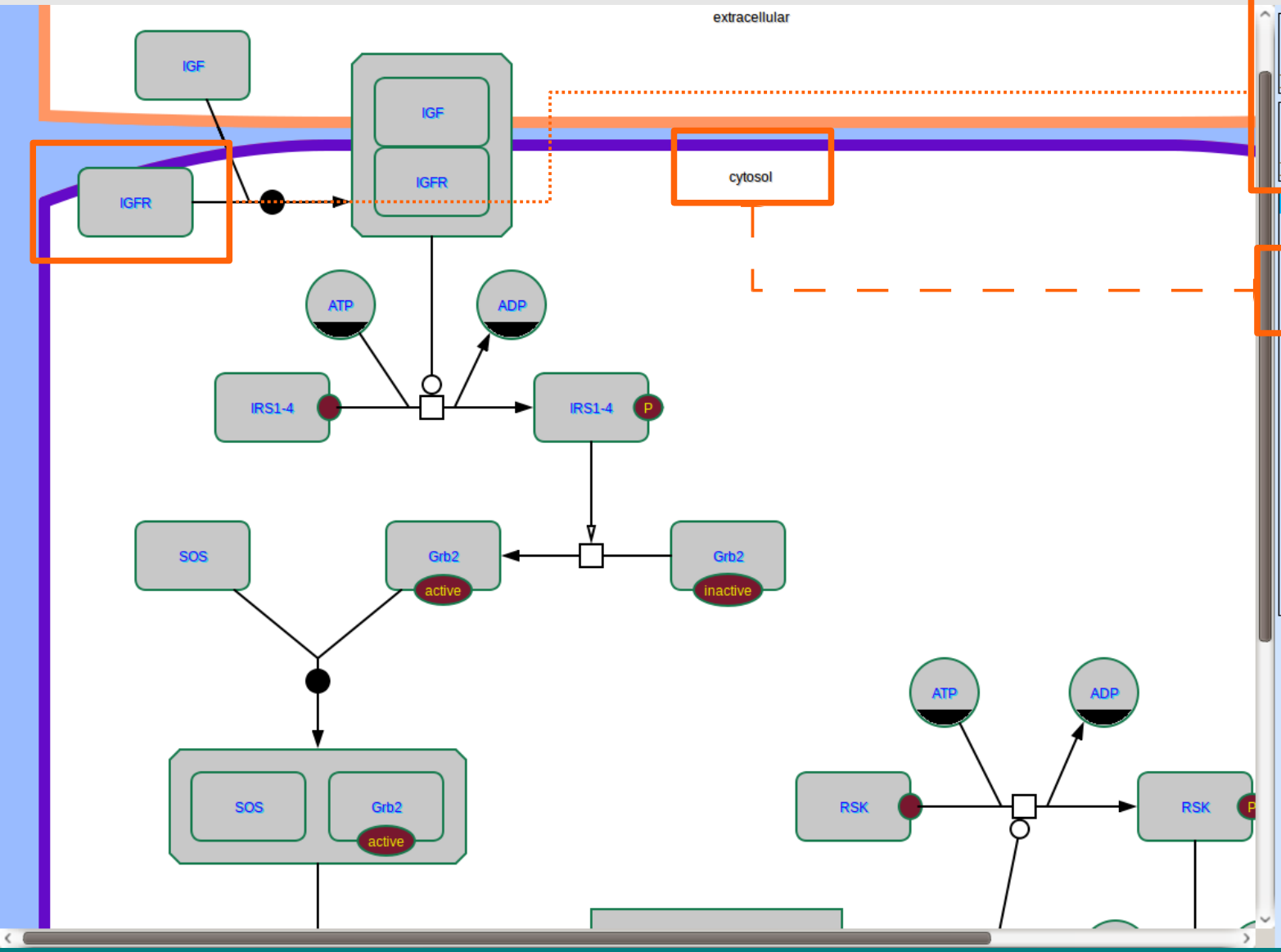
Conversion into **interactive SBGN glyphs**

- All shapes (SBGN PD) are organized as object classes

SBGN-ML glyphs are **mapped** to:

- SBGN PD glyph
- Interaction properties
- Annotations

Web interface



Perspectives

Complete SBGN support (ER and AF)

Improve browser support

Adding automatic SBGN layout

Work on the interface:

- Display of other SBML metadata
- Provide direct links to metadata
- Add graph display control

Zooming property (hide/display information)

Acknowlegments

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SBGN community