Moontorio

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1 Describing a factory

A factory is made out of machines. A machine is either a provider, a belt or a consumer. Machines are connected by ports.

$$
\begin{aligned}
Machines\ A,\ B,\ C\ ::=\ &belt\ p_i\ p_o \\
|\ \ &provider\ p_1,\ p_2,\ ...\ p_n \\
|\ \ &consumer\ p_1,\ p_2,\ ...\ p_n
\end{aligned} \tag{1}
$$

Figure 1: Machines

We can represent the factory as a directed graph, with the machines being the nodes and the ports being the edges:
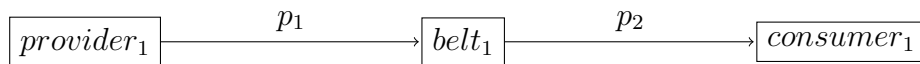

Figure 2: Example of a simple factory

2 Constraints

The first step of the factory solving process is the constraint generation. We currently use 3 different types of constraints (Figure 3). Let's take them one step at a time. The first two constrains ($p_k(t) <_{\Leftarrow} f(t)$ and $p_k(t) <_{\Rightarrow} f(t)$) are pretty similar, both limiting the flow through a port.

$$\begin{aligned}
Constraints \quad C_k \quad ::= \quad & p_k(t) <_\Leftarrow f(t) \\
| \quad & p_k(t) <_\Rightarrow f(t) \\
| \quad & p_1(t) = p_2(f(t))
\end{aligned} \qquad (2)$$

Figure 3: Constraints