Operational Model: Integrating User Tasks and Environment Information with System Model

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Why using information from user tasks ?

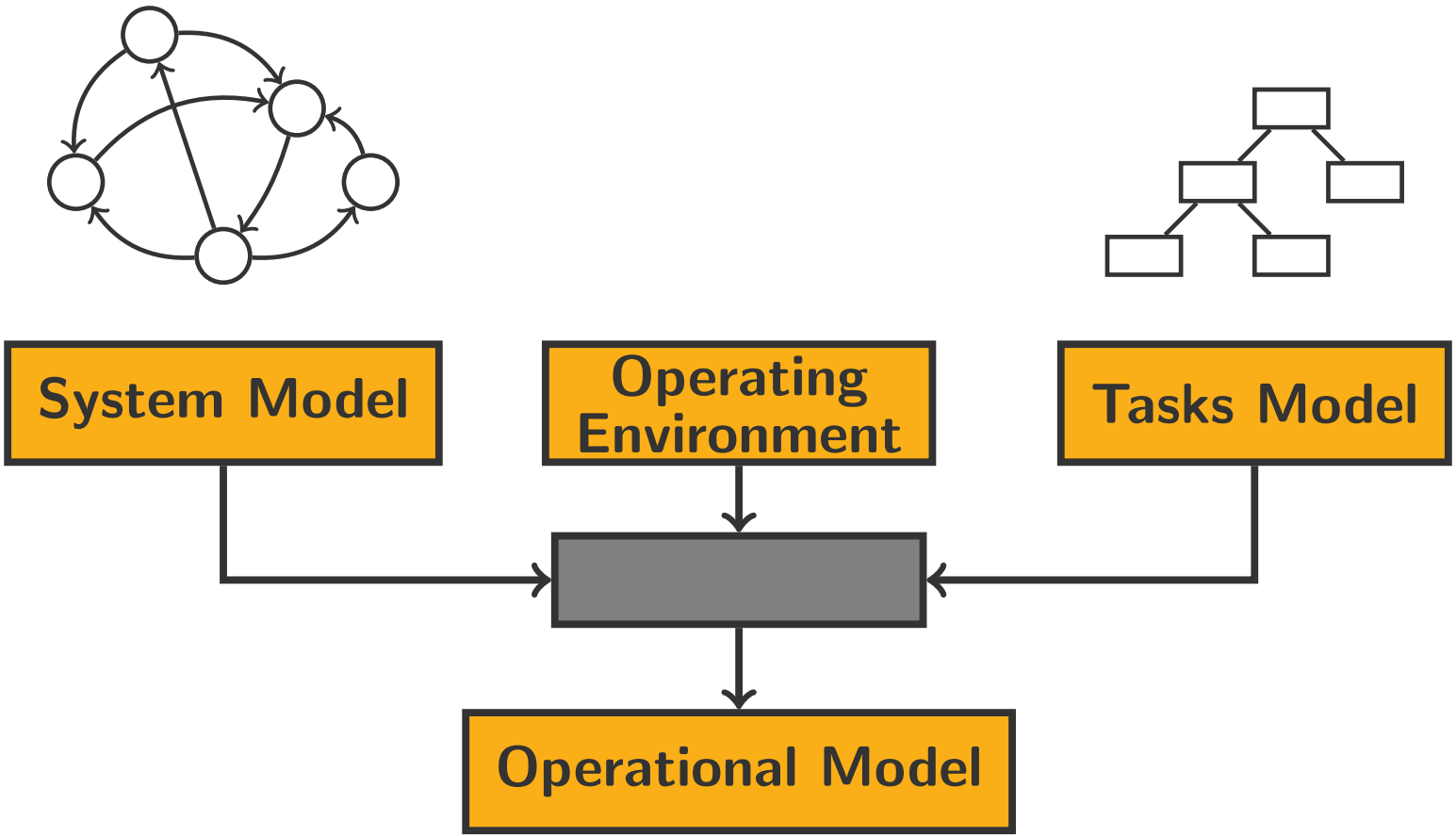
System

Task

Previous Work

- System modelled with Labelled Transition System (LTS)
- Action-based user interface :
  - Commands performed by the user
  - Observations performed by the system, observed by the user
  - $\{\tau\}$ performed by the system, not observed by the user
- Generation of system model's abstraction based on an equivalence relation on the system's states

Operational Model



Operational Model

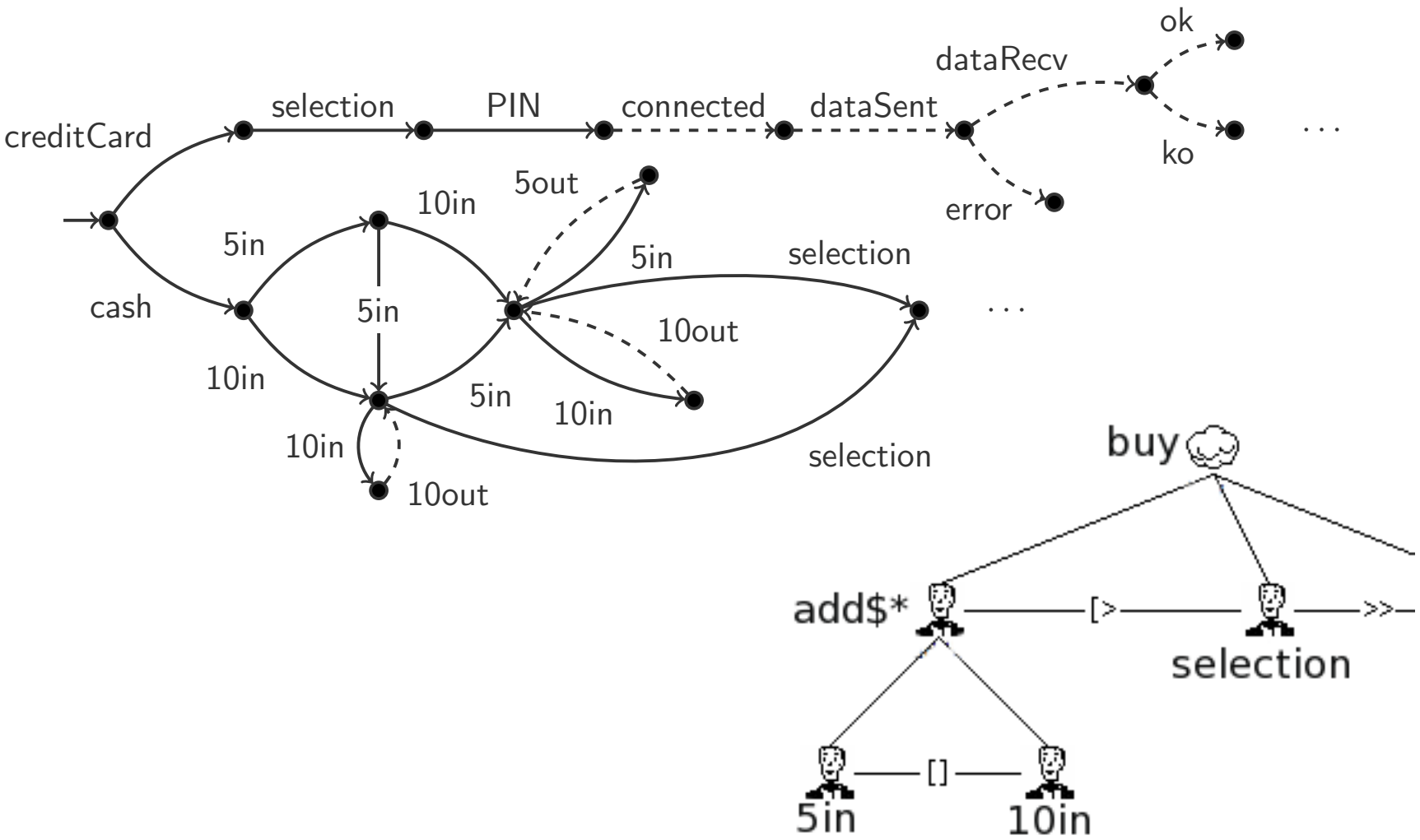
Intuition

▶ The operational model contains information from the system that is relevant to the user regarding some tasks.

- A path of observations can be matched to one task of the tasks model
- Some observation can give information about the system state
- Tasks hierarchy can be used to have different level of abstraction

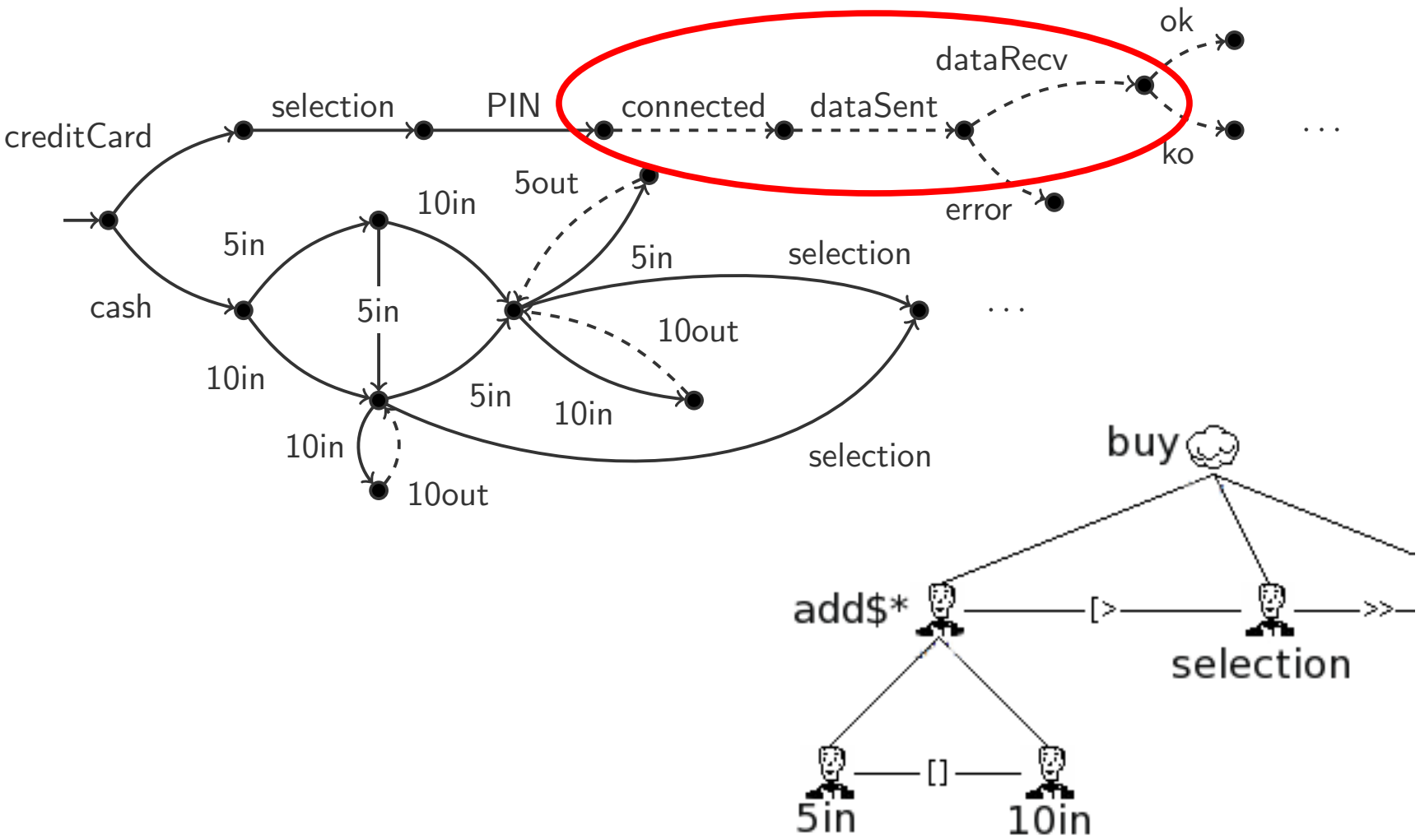
Example

A Vending Machine



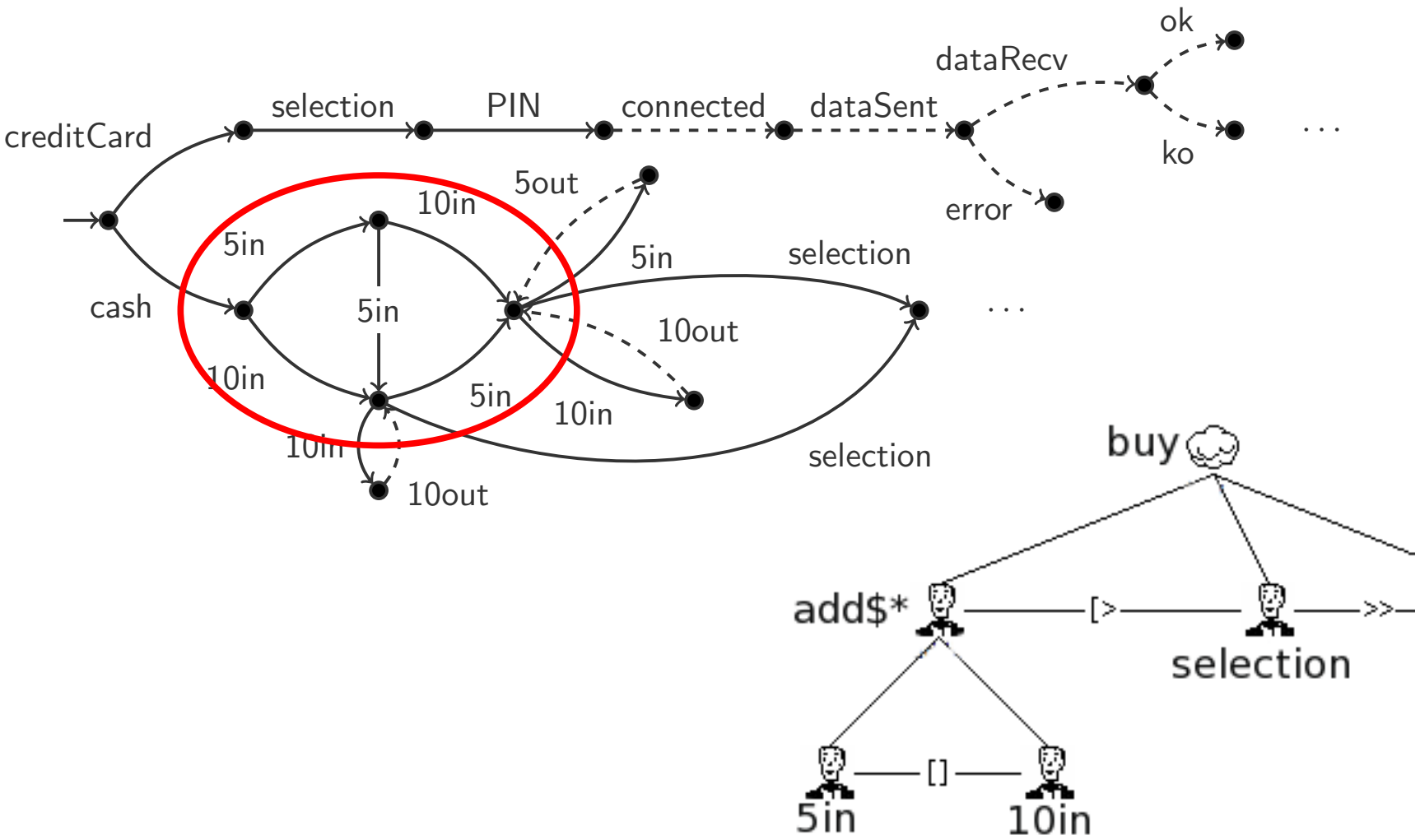
Example

A Vending Machine



Example

A Vending Machine

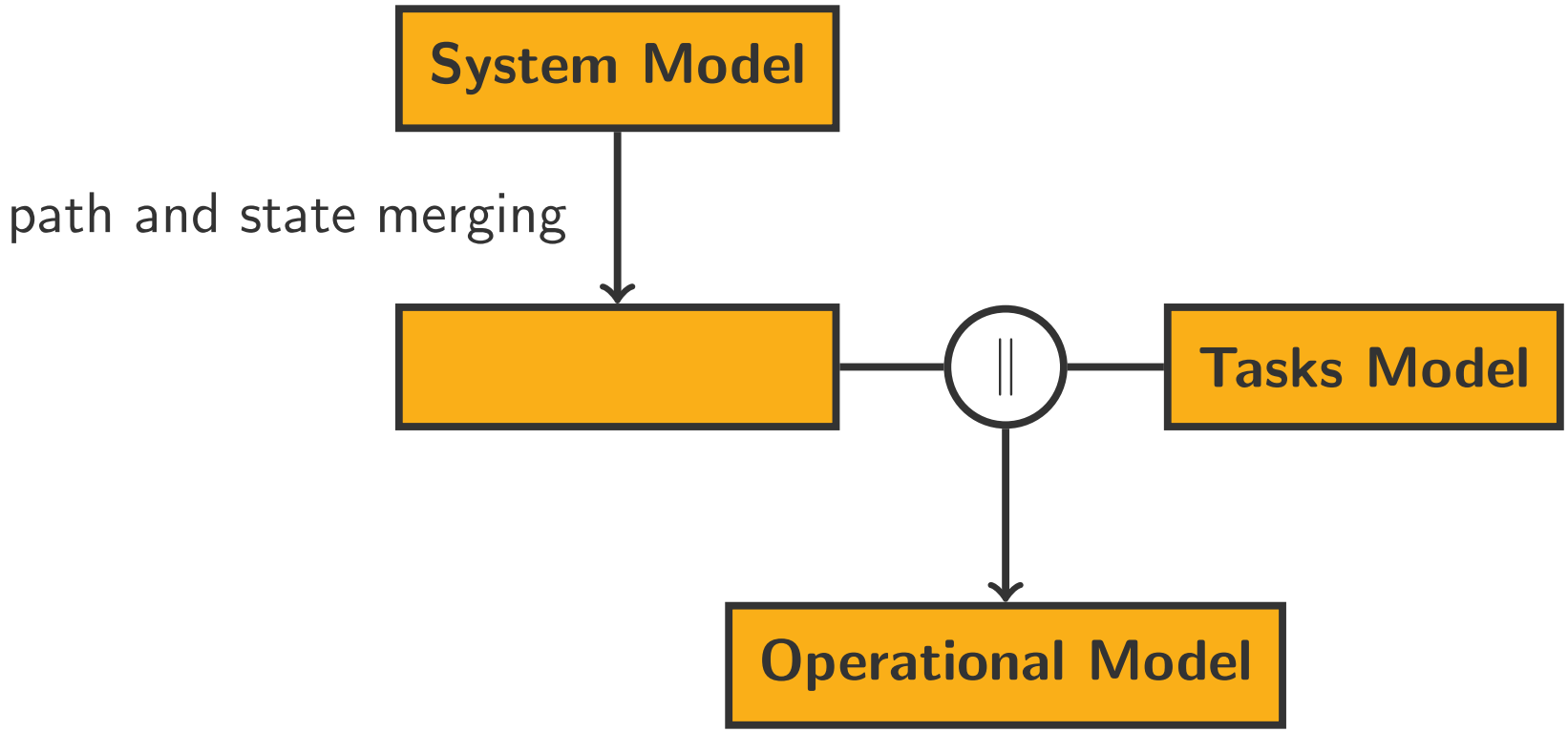


Modelling

- System Model modelled as an LTS $\langle S, \mathcal{L}, s_0, \rightarrow \rangle$
- Action-based user interface:

  $\mathcal{L} = \mathcal{L}^c$ (commands) $\cup$ $\mathcal{L}^o$ (observations) $\cup \{\tau\}$
- Tasks model $\mathcal{T}$: LTS obtained from ConcurTaskTrees models

Operational Model Generation



- System model projected on the tasks

Applications

- Generating training manuals
- Checking and evaluating systems
- Comparing different systems for the same tasks

- In the context of action-based interface

Conclusion

Contribution and further work

- This work provides:
  - a definition of operational model
  - along with a motivation about why such a model can be useful
- Further work includes:
  - formalization of the path and state merging step
  - and implementation of an algorithm
  - evaluation on a case study