Bounded Analysis and Decomposition for Behavioural Description of Components

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Collaboration with Pascal Poizat and Gwen Salaün

FMOODS 2006, Bologna, Italy

Context

- Software component architectures

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- Specifications and verifications

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- Boundedness of dynamic systems with data
- Reusing classic model-checking

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- Conclusion and future work

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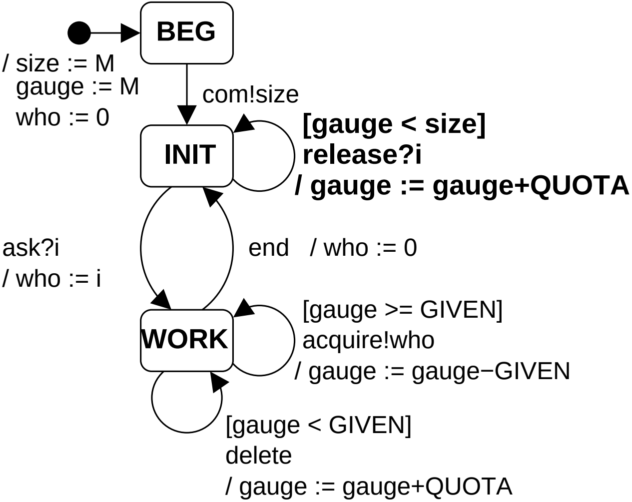

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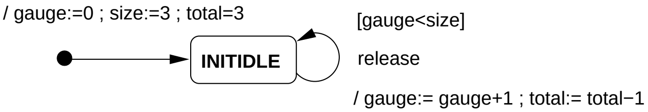
  - Related to boundedness

Configuration Graph

Configuration graph : unfolding receipts and data evaluation



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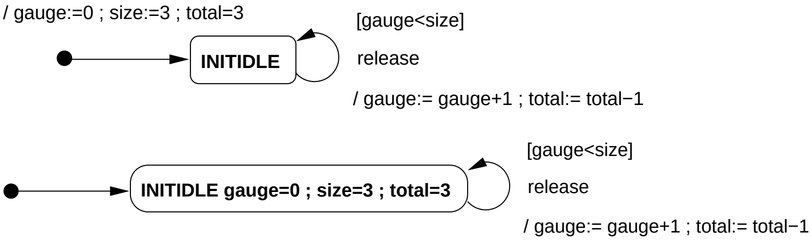

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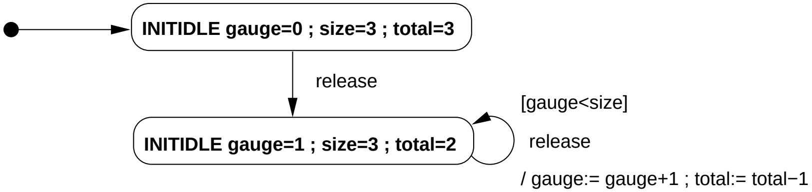

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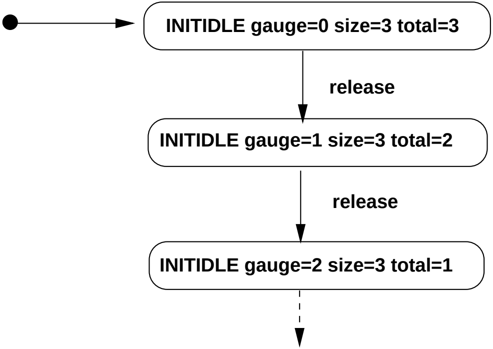

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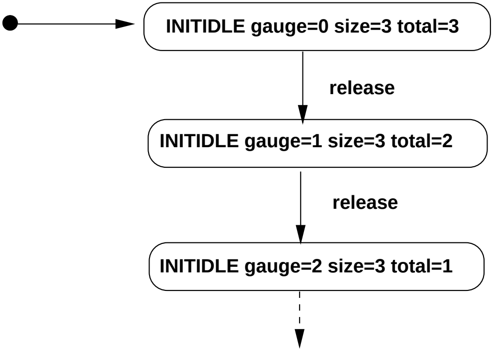

$G(d, v^0)$

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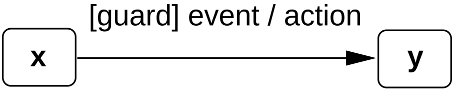
- 

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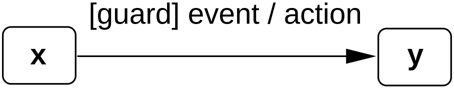
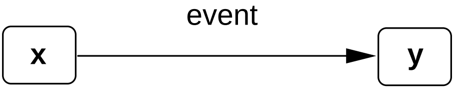
- 

- 

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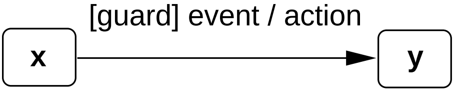
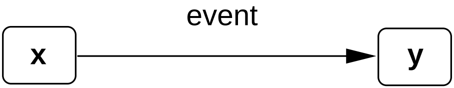
- 

- 

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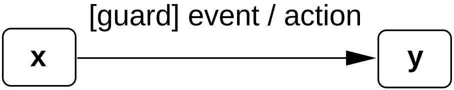
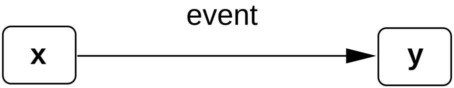
- 

- 

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- Can be used to abstract some infinite and compound systems

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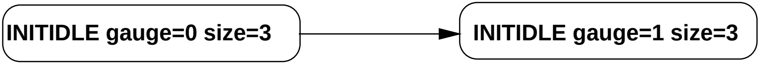
- 

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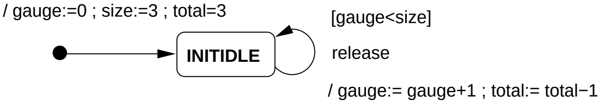

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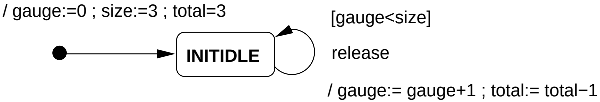
- 

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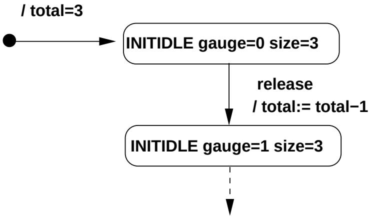

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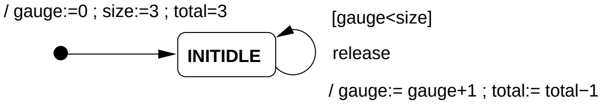

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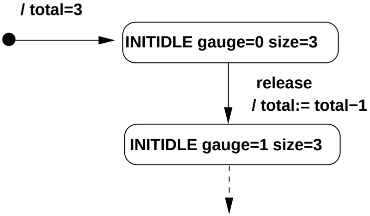

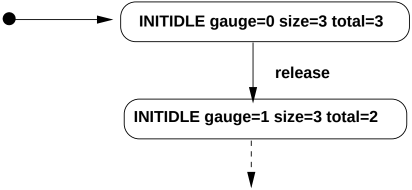

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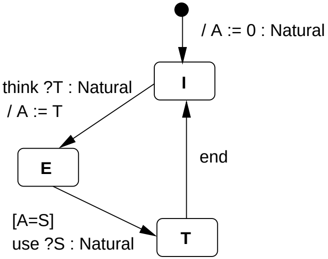
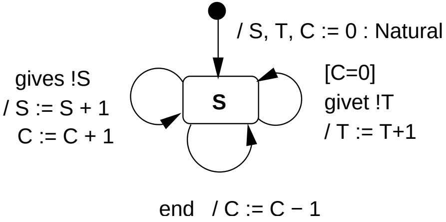
- They can be proved by model-checking on the bounded decomposition

Example 1 : Ticket Protocol





Process	**Server**

Synchronisations : `(think, givet), (use, gives), (end, end)`

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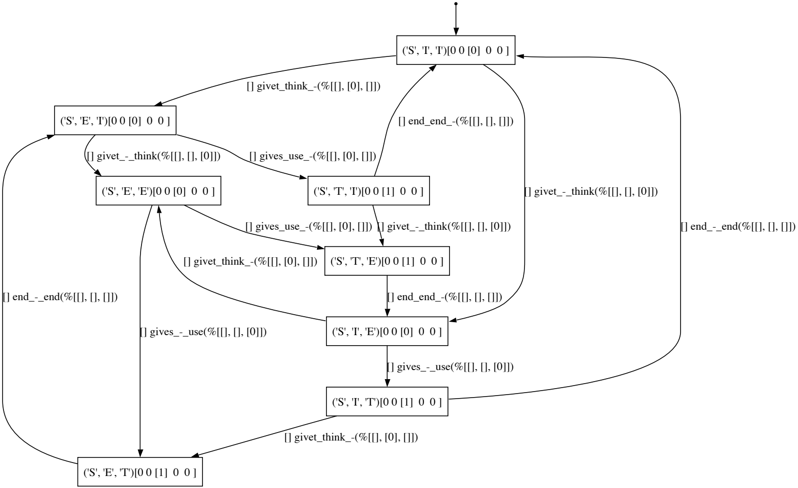
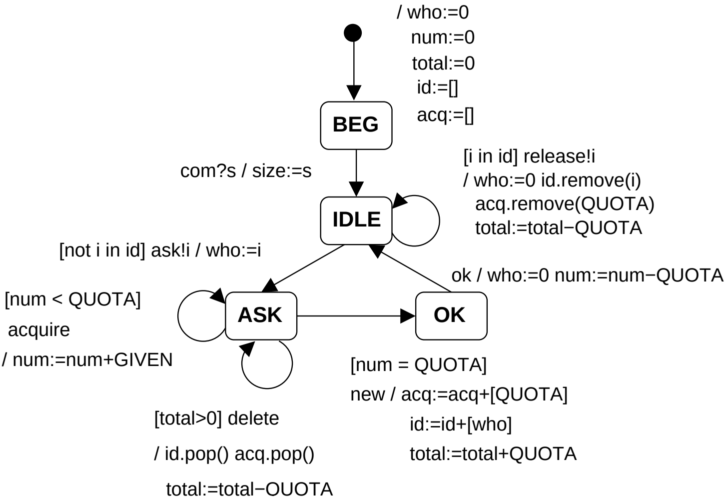
- One counter : boundedness is decidable !

The Bounded Analysis



Server x Process x Process

Example 2 : A Resource Allocator : the Client System



Verifications

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