Formalizing Theatrical Performances Using Multi-Agent Organizations

Andreas Schmidt Jensen, Johannes Svante Spurkeland and Jørgen Villadsen

Department of Applied Mathematics and Computer Science
Technical University of Denmark

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Introduction

- Theatrical performances
  - Strict storyline?
  - Improvisation?
  - $\Longrightarrow$ The IRL method

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  - Strict storyline?
  - Improvisation?
  - $\Longrightarrow$ The IRL method
- Multi-Agent Systems
  - Intelligent agents with goals
- Can we use MAS for theatrical performances?

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  - Each act contains a number of fixed events
  - The actors improvise according to their characters
  - Must eventually reach each of the fixed events

Win-Win: Vi elsker penge

(Win-Win: We love money)

- Four acts about money in an airport
- A lost briefcase filled with money
- Each character has a conflict revolving around money
  - The briefcase would resolve their conflict
- Characters become aware of the contents
  - Changes behavior
  - Pursuits the briefcase
- Characters have flashbacks, which provide background for the characters
- A lot of interaction with the audience

An example: Act 1 & 2

Act 1. The characters and a few members of the audience are standing in a line. They grow impatient and the line scatters. The actors walk around the airport behaving in accordance with their character. At some point, each character has a flashback, which gives the audience an understanding of the character's personality. The act ends when all characters are present in the same location at the same time, a so-called "all-in" situation. One of the characters will have found out that he has a suitcase full of money, but it is mistakenly taken by another character.

Act 2. Two more characters will realize that the suitcase is full of money. The character initially carrying the suitcase will hold on to it until the end of the act, though it may change hands for shorter periods. Each character has a flashback. The act ends when the initial character finds out about the money and the last character, ignorant of the money, takes the suitcase.

Organizations in Multi-Agent Systems

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  - Reactive
  - Autonomous
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- Why organizations?
  - Agent objectives should match system objectives
  - More efficient coordination and cooperation
  - Norms or obligations to limit the agents' autonomy

The OperA Model

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  - Roles, objectives, role dependency.

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- Communicative Structure
  - Communication language, ontology

Toward a Formalization

Can Win-Win be formalized using Multi-Agent Systems?

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- Act $\rightarrow$ Scene script
- Fixed events $\rightarrow$ Interaction pattern

The social structure: Actors & Characters

- Actor
  - Wants to make character believable?
  - Wants to get it over with?
  - Wants to make the audience laugh?
- Character
  - Personality
- Dependency
  - Characters depend on interaction with audience
- Conflicts
  - Audience members cannot enact character roles

The interaction structure: Returning to Act 1 & 2

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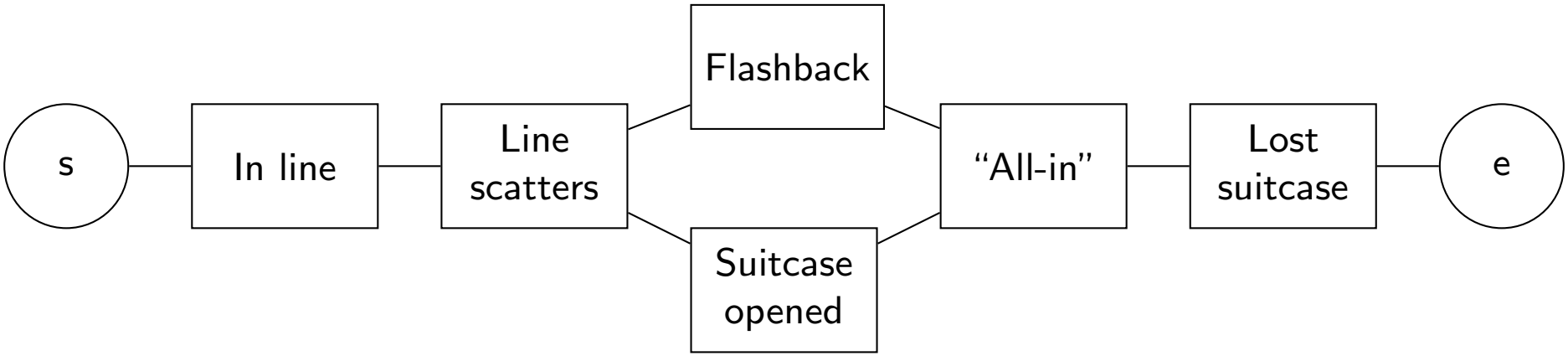

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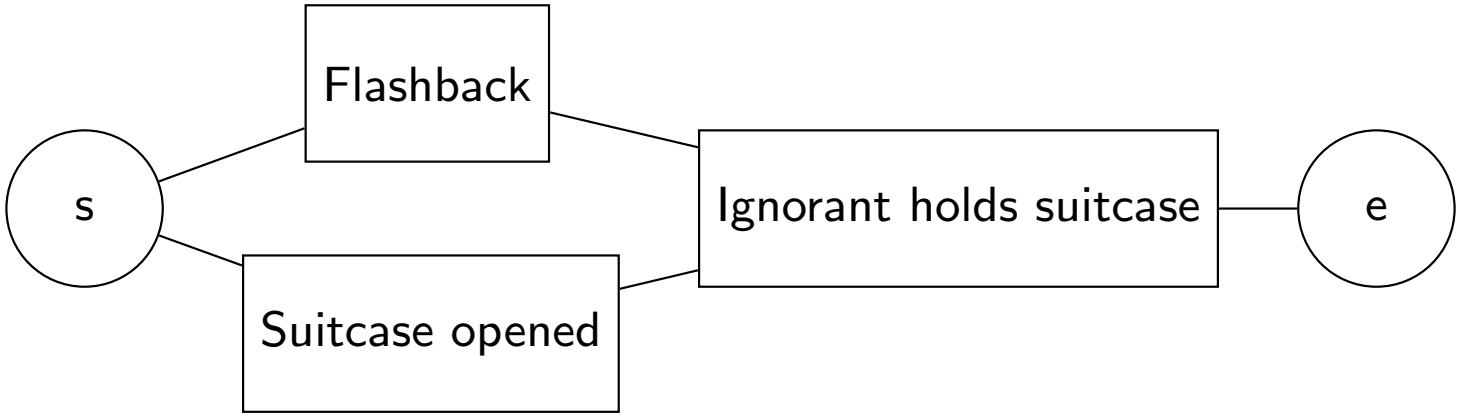
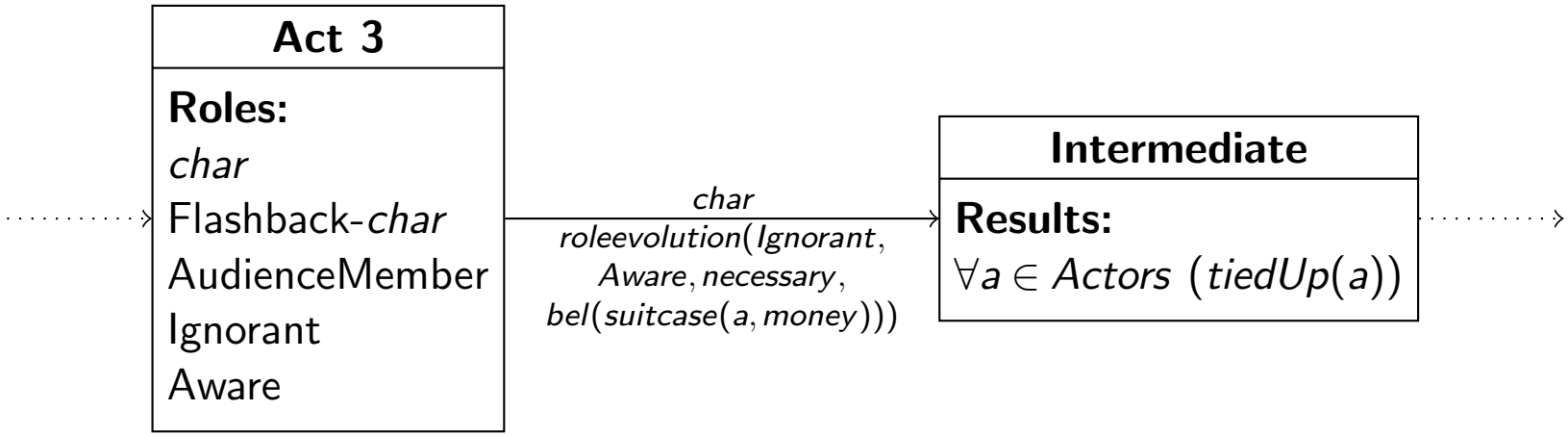


The interaction structure: Intermediary scenes



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  - How to achieve the results of the scene

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- Scene reasoning
  - How to reach the next fixed event
  - How to achieve the results of the scene
- Scene transition reasoning
  - What kind of evolution happens to my role?
  - Which scene is next?

Conclusion & Future work

- Theater 770° bears resemblance to Multi-Agent Systems
- First steps toward simulating such performances
- Reasoning possibilities

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- Including Social and Interaction model of OperA
- Organizational reasoning vs. theatrical reasoning
- Measuring success?

Thank you for your attention