Design and Analysis of Distributed, Interacting Systems (DIS)

Tutorial 02

Raphael Pham
Raphael.Pham@inf.uni-hannover.de

18.04.2013
• Electronic code needs to be sent in by email to
  – Raphael.Pham@inf.uni-hannover.de
  – IMPORTANT: Subject of the email must be:
  – DIS-tut <nr.-use-two-numbers> <Prename Lastname>
  – Example: DIS-tut 01 Raphael Pham
  – NOTHING more, NOTHING else; otherwise: not registered.
• If you want to reserve a spot for presentation, write an e-mail.
• If you really want to get behind R, S, and D, read:

Four dark corners of requirements engineering
P Zave, M Jackson - ACM Transactions on Software Engineering and ..., 1997 - dl.acm.org
... Some of our examples are given in Gries and Schneider's equational logic [Gries and
Schneider 1993]. Time and temporal properties are encoded in logic as follows [Zave and
Jackson 1993]. Four Dark Corners of Requirements Engineering • 7 ...
Zitiert durch: 593 Ähnliche Artikel Alle 56 Versionen Zitieren

Deriving specifications from requirements: an example
M Jackson, P Zave - Proceedings of the 17th international conference ..., 1995 - dl.acm.org
Sotisvare development is concerned with the con- struction of machines of a particular kind those
that can be implemented by a general-purpose computer, which then becomes the desired
machine. Many prob- lems can be solved by these means [Jackson 94], in- cluding ...
Zitiert durch: 146 Ähnliche Artikel Alle 30 Versionen Zitieren Mehr

2
The turnstile machine
Scenarios

• **Positive scenario:** A user pays the entrance fee. Then the turnstile is unlocked and he can push the turnstile, by which he enters the zoo.

• **Negative scenario 1:** If the user does not pay the entrance fee, the turnstile is not unlocked. He then cannot push the turnstile.

• **Negative scenario 2:** If the user pays the entrance fee once, he cannot push the turnstile more than once.
• Zoo Entrance Gate

- User
- Turnstile
- Vending machine
- Edgar
- Zoo
- Coin slot
- Controller
- System
- Software

Raphael Pham, DIS-Tutorial 01
Environment Analysis, Context Diagram

User

Turnstile

Vending machine

Controller

Coin slot

Coin inserted

Insert coin

Lock, unlock

Pushed

Push

Enter

Zoo

Raphael Pham, DIS-Tutorial 01
Requirements (R), Specification (S), Domain Knowledge (K)

Requirements: What does the environment look like when my system is in place? What set of properties will fully satisfy the customer?

- R: Each person that enters the zoo shall pay an entrance fee in coins. **Liveness:** under condition x something shall happen...
- R: No person enters the zoo without paying. Enters do not outweigh pays. **Safety:**

Specification: What can my system do to achieve this?

- S: If the user pays, the turnstile is unlocked. **Liveness:**
- S: If the user enters, the turnstile is locked again. **Liveness**
- S: If the turnstile is unlocked, there must not be a second unlock without a previous lock. **Safety:**

Domain Knowledge: What are the rules of the environment? How do things work here?

- D: If the turnstile is unlocked and a push occurs, am enter occurs.
- D: When the turnstile is locked, and a push occurs, then enter must not occur. **Safety:**
- First: Living example: Turnstile and ThriftShop.
- Second: Define this automaton.