

Empirical Modelling for Concurrent Systems

(Module)

1. Introduction, Motivation and Perspective

1.1 Systems issues

1.1.1. Closed-world modelling

roomviewer
pendulum / VCCS
digital watch

object-oriented modelling
Newtonian mechanics
statecharts

Characteristics of such models

1.1.2. Open development / modelling for design

roomviewer 2
railway animation
cricket

spreadsheet
human interaction / conventions
agent interaction

Characteristics of such models

1.1.3. Eden programming

definitive script + action for simulation
user-driven state changes

2. Agency and Dependency in Systems Analysis

2.1. Explanatory and Empirical Modelling

anthropomorphic approach to analysis of reactive system behaviour
animism + artefacts for animation

animism: agent identification, causality, attribution, effects of actions
artefacts: metaphorical representation of state, experiment

1-agent systems: dependency, representation of interaction
artefacts and correlation of observables and interactions
visualisation: Scout and DoNaLD

ficts: pragmatism in account of system activity
operational ambiguity and openness

designing behaviours: concurrent engineering, multi-level perception (OXO)

3. Agent Specification using LSD

observables: states, oracles, handles, derivatives and privileges

LSD analysis of a system
One Day in Severn video
Railway accidents in history

telephone, electronic catflap, sailboat

concurrency: synchronisation of agent existence / instantiation

4. Animation in the ADM

entities
annotation of actions
OXO in the ADM

user-driven parallel computation: conflict detection, super-agent intervention

ADM as machine vs. ADM as observation regime

operational semantics as of observer agent

5. Empirical Modelling in context

5.1. Applications

software engineering, definitive programming, translation, jugs, digital watch
Sisyphus lift, Society of Mind, lines (empirical knowledge)
systolic arrays

5.2. Architectures

tkeden
DAM, JAM
higher-order definitions
parallel implementation

5.3. Foundations

Brian Smith, William James

To do

Plan lectures: copy old disk and replicate where appropriate

collate papers

check relevant case studies

resurrect SAND and SIT