Module S4 Empirical Modelling for Concurrent Systems

Timetable

Monday 3rd March 1997: Semantics of Interaction

09.15 Module Overview: SBR + timetable + assessment plans

09.45 Lecture 1: A Perspective on Concurrent Systems

- *concurrency as observer defined*
- *agency as confounding expectations*
- *interaction, state and dependency*

concurrency, agency, dependency, action, state all to be formulated with reference to interaction between a person, or person-like agent and the world

10.30 Demonstration: *show some simple tkeden animation of concurrent system issues*

11.00 *Coffee*

11.15 Tutorial 1: Introduction to Modelling with tkeden

12.00 *Exercises in tkeden animation 1: random interaction / observation models*

01.00 *Lunch*

02.00 Tutorial 2: Introducing Definitive Notations

02.45 Demonstration ?OXO + roomviewer

03.15 *Exercises in tkeden animation 2: room design, adventure game, experiment lines*

04.00 *Tea*

04.15 Lecture 2: Spreadsheet Semantics and James' Radical Empiricism

- *not traditional rational-empirical framework*
- *spreadsheet semantics*
- *absolutism vs. pragmatism*

representation of experience, alogical representation

05.00 Laboratory

Tuesday 4th March 1997: Agency in Concurrent Systems

09.00 Lecture 3: Reactive Systems Modelling: Animism, Artefacts, Animation

• *modeller is agent -> agent is human -> agent inanimate*

Analysis to explain how develop representations etc.

observables

empirical elements in radical empiricism perspective

knowing: artefact and system

3 uses of the artefact: personal, 'objective', metaphorical

Practical program:

agent-oriented analysis, artefact development, animation, automation

09.45 Demonstration: Railway Animation

11.00 *Coffee*

11.15 Tutorial 3: Principles of LSD specification

What is agency? How to use experiment to analyse agency in a system?

12.00 Case studies: Telephone, Railway Station Animation, Electronic Catflap

01.00 *Lunch*

02.00 Lecture 4: Visualisation and Concurrent Systems Modelling: Artefacts

How to apply definitive principles to construct artefacts

Importance of visual in system design (Harel)

Illustrative examples

02.45 Demonstration: Visual Interfaces with SCOUT and DoNaLD, digital watch, jugs

04.00 *Tea*

04.15 Tutorial 4: An Introduction to Scout

05.00 Tutorial and Laboratory: *constructing artefacts using tkeden*

Wednesday 5th March 1997: Explanatory and Empirical Modelling

09.00 Lecture 5: Empirical Modelling as Explanatory Modelling

- *primitive perspective on a concurrent system*
- *non-operational aspect: subjectivity, particularity, unreliability*
- *personal, particular, provisional*
- *what observables? what behaviour? what viewpoint?*
- *ficts*
- *construals*
- *0/1/multi-agent models*

09.45 Railway History theme introduced

experimental investigation -> human driven -> fully automated

railway accidents *video*

10.30 Exercise on LSD: Railway Accidents

11.00 *Coffee*

11.15 Case study: Railway Accidents

12.00 Discussion of Railway Accidents

01.00 *Lunch*

02.00 Video: One Day in Severn

02.30 Tutorial 4: *observables in railway interaction*

04.00 *Tea*

04.15 Lecture 6: Concurrent Engineering for Concurrent Systems

negotiation of behaviour

meta-level interaction

explanatory communicative role for artefacts

resolution of conflict between viewpoints / commitments / OO modelling

05.00 Laboratory

Thursday 6th March 1997: Modelling System Behaviour

09.00 Lecture 7: The Abstract Definitive Machine

- *entities / definitive scripts*
- *super-user driven*
- *regimes for execution*

10.00 Tutorial: Animating LSD specifications in the ADM

Case studies: Beetles, Classroom Interaction (?), Cricket?

11.00 *Coffee*

11.15 Lecture 8: ~~Observations, continuity and events~~ The ADM in Computer-Based Empirical Modelling

ADM as observation model vs. ADM as machine

12.00 Tutorial: Linking the ADM and EDEN, OXO

01.00 *Lunch*

02.00 Seminar: Applications of Empirical Modelling / Laboratory.

Beetles: Society of Mind
Digital Watch: statecharts + SIT
Systolic Array development: SAND
Sisyphus Lift: Knowledge representation
Lines: empirical knowledge

04.00 *Tea*

04.15 Lecture 9: From Principles vs. Pragmatism to Principled Pragmatism

Four perspectives on Empirical Modelling

What logic / formalism buys

What Empirical Modelling offers in these respects

Framework for modelling and application to areas

What's going from WK. also

05.00 Laboratory

Friday 7th March 1997

09.00 Lecture / Seminar 10: Issues for EM, Future Research Directions and Projects

- *DAM*
- *translation*
- *JAM*
- *HODs*
- *parallel implementation*
- *parallel programming (Baldwin)*

10.00 Laboratory and Individual Consultations

11.00 *Coffee*

11.15 Laboratory and Individual Consultations

12.00 Concluding Discussion

12.45 Module Debriefing

01.00 *Lunch / End*