

CS405 Introduction to Empirical Modelling

Orientation

Two titles, One theme

Interactive Environments and Empirical Modelling

(see double-sided handout: 'By way of orientation...')

Interactive Environments

Early emphasis on processing symbolic data, recently a greater role for the generation of experience....

Classical CS theory good for information processing, not so suited to experiential or experimental activities (pre-theory)

Conceptual limits of our interactions with world not prescribed in advance but depend instead on our construals of world ...

Our construals cannot be given in symbolic form but need embodiment in artefacts, interpreted through experience.....

Interactive Environments and EM

Traditional concern with automation and symbolic data

Many tasks now more suited to close integration of human and computer processes ('human computing')....

EM seeks to build interactive environments that are truly open and experiential

Aim is to construct artefacts that reflect observations, dependencies and agencies that we identify through continuous experimental interaction (cf artist)

Empirical Modelling

Priority of observation and experiment

Principles and tools: philosophical and practical

Significance of student contributions

Observables, dependency, agency (small example)

www.dcs.warwick.ac.uk/modelling/

The JUGS example

Originally an educational program

Can we 'model the meaning' and translate to targets?

Harder than it appeared: comprehension and optimisation

Issues of understanding versus function

Unbounded richness of state versus needs of specific purpose

Empirical Modelling Project I

Began early 1980's under leadership of Meurig Beynon
Name evolved reflecting different aspects
 modelling with definitive scripts
 agent-oriented modelling
Driven by project students and research students
Substantial output of publications, models and conference contributions over wide range of fields (See webpage.)
Limited recognition or perplexity from CS + grant-awards

Empirical Modelling Project II

Taught at u/g and MSc level for some years
Good reception from wide variety of students
Inherently interdisciplinary in nature
Strong appreciation coming from computing for humanities
Principles better developed than tools, makes adoption hard
Needs better dissemination and funding
www.dcs.warwick.ac.uk/modelling

Is computing an experimental science?

Two senses of 'experiment': pre-theory and post-theory
Each sense giving rise to distinctive approaches and treatments of experience
EM exploits the computer for pre-theory experiment
Conventional programming exploits the computer for post-theory experiment

Experiment : post-theory

Experiment post-theory uses experience:

- interpreted with respect to preconceived context
- circumscribed with respect to relevance
- amenable to consistent interpretation

Experiment : pre-theory

Experiment pre-theory uses experience:

- in a situation not yet well-understood
- open to interpretations and interactions that are as yet unknown
- with inconsistencies and ambiguities not yet resolved

Thus: Situatedness, Ignorance and Nonsense (SIN)
Hence EM concerned fundamentally with sense-making

New vision of computing...

Computing as an experimental science in *both* senses must include:

- semantic frameworks other than those with formal symbolic interpretation
- principles that guide and account for practice and include ideas of SIN
- meaning and truth as given by experience

This is a (much) wider sense of computing than usual.