

## Experience and Computation

*Steve Russ*  
[sbr@dcs.warwick.ac.uk](mailto:sbr@dcs.warwick.ac.uk)  
*Department of Computer Science*  
*University of Warwick, UK*

## Interactive Environments and Empirical Modelling

## Human Computing

Broader perspective

- ... devices augment the human mind in the making of meaning
- ... principal activity is the building of cognitive artefacts (models) in a way driven by experience
- ... emphasis on engagement rather than automation
- ... the integration of artificial automated processes with human deliberative processes

## Machine Computing

Dominant culture of programming

Challenge of software development

Central role of logic and abstractions

Semantics of program seen in machine more than world

Special case of computing suited for automation

## Meaning and Experience

- ... recognise part of my world in the computer model
- ... maintain that world-model link during construction
- ... experience of correspondence drives the development
- ... significant source of interactive experience
- ... electronic medium for self-expression

## 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/](http://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 (sections of) humanities

Principles better developed than tools, makes adoption hard

Need better dissemination and funding

[www.dcs.warwick.ac.uk/modelling](http://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 uses experience:

interpreted with respect to preconceived context

circumscribed with respect to relevance

amenable to consistent interpretation

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

Principle of Situation, Ignorance and Nonsense (SIN)

Hence EM concerned fundamentally with sense-making

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 SIN

meaning and truth as given by experience

## Computing in the Humanities - Servant or Partner?

Perceived duality in experience: opinion and perspective versus fact and reality

Computer program as objective and efficient, interpretation and analysis as the domain of a humanities discipline

Used to be OK, but subverted now by current practice in which the computer is part of the context of interpretation

Vision of Empirical Modelling and human computing seeks to dissolve such dualities and make true partnership possible