

4th Warwick Electronic Bulletin on Empirical Modelling

1

Assessment for CS405

The assessment of the CS405 module is 50% by examination and 50% by coursework.

The coursework exercise for 2007-8:

- contribute a short paper, together with
 - an associated modelling study
- to WEB-EM-4, the
4th Warwick Electronic Bulletin on Empirical Modelling
(to be published on the intranet in due course)

2

Further information

Application linked to one of eight principal applications areas listed in the **Call for Papers ...**

... 'modelling study' to be broadly interpreted:

- an entirely new and original EM model
- and/or to the extension, comprehension or documentation of an existing EM model

You can specify the weight to be given to the written and modelling components between 30-70 and 70-30

3

Deadline dates

Preliminary submission by Wednesday 27th February

- title and abstract of paper
- proposed theme of modelling study
- references to be consulted

Final submission by Tuesday 6th May

- paper and model with proposed weighting
- ... to be submitted using the BOSS system

4

Further information

- More details of potential themes and application areas to be given later in the module
- WEB-EM-1 and WEB-EM-2 online at
.../dcs/research/em/publications/web-em/
- Guidance on writing your paper, including style templates and details of recommended length etc available online at:
.../dcs/research/em/teaching/cs405/assignment/

5

Advice on Submission

- start with a simple modelling exercise
- find existing EM models / papers of interest
- identify a topic/theme relating to an area of personal interest (e.g hobby, group project)
- consult with other students and EM experts
- look for useful external references on your theme
- don't be intimidated or over-ambitious initially
- note strategic implications of choosing weighting

6

Possible themes 1

- the discussion of an original model to illustrate how EM might be used in an application
e.g. the construction of an EM model to assist in the design and use of a mobile phone
- a comparison of how EM principles and conventional approaches address a particular application
e.g. a discussion of how observation-oriented parsing relates to traditional parsing, with examples

7

Possible themes 2

- an analysis of how EM tools could be improved with reference to a particular area of application
e.g. an investigation into how tkeden might be better adapted for use as a text processing tool
- a detailed evaluation of how well an existing EM model is adapted to its application
e.g. a study of how far the Jugs model can assist in porting software across platforms

8

Possible themes 3

- a critical assessment of the advantages claimed for EM in application in previous EM publications
e.g. an exploratory study and critique of how EM can be used to model software requirements
- a study of what is entailed in extending and/or combining existing models, and the implications
e.g. combining stick animations with models of sorting algorithms as an educational aid

9

MSc projects

Coursework for this module can potentially be linked to a subsequent MSc project, subject to appropriate separation of concerns.

For some suggestions, consult:

[.../dcs/research/em/teaching/projectideas](#)

10

Interactive Graphics and Design

Early period of EM research

- no EDDI, no AOP, no SASAMI - so revisit

- (re)develop a demonstration tool for tkeden
- investigate Empirical Hyperfun (RIC)
- geometric modelling notation CADNO
- collaborative design

11

Concurrent Systems Modelling

- CSP/CCS concurrency issues (cf. SGM)
- concurrency workbench and similar tools
- protocol specification / analysis
- traffic / cricket / insect simulation (KC)
- ADM re-implementation (e.g. via AOP)
- SAND systolic array notation
- pendulum study in engineering control
- investigate the Asylum tool (DC)
- discuss the 'blocks' model
- Wii remote concurrent interaction

12

Concurrent Engineering

- LSD for design team (AJC)
- dtkeden collaborative design environment studies
- versioning in collaborative EM sw development
- prototyping for group projects
- warehouse model exploration / documentation
- DB support for concurrent engineering
- Process Rework ISM (ME)
- 'concurrent engineering' for requirements
- collaborative puzzle solving e.g. sudoku

13

Human Computing

- interface to spreadsheet software
- interface to tkeden for specific applications
- DMT tool development / integration into tkeden
- ubicomp proposal (AW)
- timetabling case studies
- crosswords
- stories
- adaptive interfaces and user modelling
- sketching tool - tkeden interactive whiteboard

14

Artificial Intelligence

- concept maps
- language translation
- expert systems (Sisyphus)
- game extensions
- automatic analysis / evaluation of EM models
- neural nets
- agent-based systems (e.g. KC)
- modelling perceptions

15

Educational Technology

- Virtual Electrical Laboratory
- I-blocks (Lund - Denmark)
- RSE and Kids' Club (C Roe, Joensuu)
- disabilities (blind, paraplegic, elderly)
- interface as in IMAGINE (C Roe)
- programming for the blind
- interactive whiteboard application
- mathematical visualisation
- model of HIV / AIDS for Tanzania (ES)
- Tutorial D prototyping (HD)

16

Software Development

- tkeden libraries (e.g. matrices)
- parser exercises
- object abstraction exercises (J-P)
- systems integration (SM/WMB)
- translating EM models to procedural programs
- web interfacing (AW)
- evaluate interface mechanisms e.g. VB
- Pjawns comparative study
- Pjawns tournament demo model
- EM sw development study / evaluation (C.Heating)
- EM 'patterns' in development

17

Humanities Computing

- looking at how dependency is used in existing models, such as McCarty's Onomasticon for Ovid's Metamorphoses, and in spreadsheet models of textual analysis
- developing new / extending existing EM models of musical compositions
- considering how tkeden can be extended to address topical issues for the humanities, such as modelling artworks, handling sound, and processing written texts

18