

**New Light  
on  
Worlds Before and Beyond Words**

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*Some words ....*

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“ It is difficult not to notice a curious unrest in the philosophic atmosphere of the time, a loosening of the old landmarks, a softening of oppositions, a mutual borrowing from one another on the part of systems anciently closed, and an interest in new suggestion, however vague, as if the one thing sure were the inadequacy of the extant school-solutions. ”

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“ ... The dissatisfaction with these seems due for the most part to a feeling that they are too abstract and academic. Life is confused and superabundant, and what the younger generation appears to crave is more of the temperament of life in its philosophy, even though it were at some cost of logical rigor and of formal purity.”

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*.. words that could apply to  
contemporary computing ...*

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William James – in the preamble to his essay:

*The World of Pure Experience*

Essays in Radical Empiricism, 1910

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*Beyond words ...*

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John Dewey discussing the word  
“experience”

*Essays in Experimental Logic (1916)*

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## John Dewey at the typewriter ...

The word which I have just written is momentarily focal; around it there shade off into vagueness my typewriter, the desk, the room, the building, the campus, the town, and so on. *In* my experience, and in such a way as to *qualify* even what is shiningly apparent, are ...

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## John Dewey with PowerPoint ...

- all the physical features of the environment extending out into space no one can say how far
- all the habits and interests extending backward and forward in time, of the organism which
  - uses the typewriter
  - notes the written form of the word only as a temporary focus in a vast and changing scene

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## About Experience

... when the word "experience" is employed in the text it means just such an immense and operative world of diverse and interacting elements.

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## About Experience ...

It might seem wiser, [because] the term "experience" is so frequently used ... to denote something very different from such a world, to use an acknowledgedly objective term: to talk about the typewriter, for example. But experience in ordinary usage ... expressly denotes something which a specific term like "typewriter" does *not* designate: namely, the indefinite range of context in which the typewriter is *actually* set, its spatial and temporal environment, including the habitudes, plans, and activities of its operator.

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## About Experience ...

... [We don't] use a general objective term like "world," or "environment," [because] the word "experience" suggests something indispensable which these terms omit: namely, **an actual focusing of the world at one point in a focus of immediate shining apparency ...**

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## *Radical Empiricism and conjunctive relations*

## Radical Empiricism (RE)

- “a philosophic attitude” William James (1910)
- RE has suffered criticism and neglect
- RE invokes the word 'experience' to refer exclusively to what is given moment-by-moment in the perception of a person
- what is given in experience is more than discrete sensory elements – it encompasses *relationships of a conjunctive nature*

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## Conjunctive relations: degrees of intimacy

### ***The most external relation***

common to a universe of discourse

simultaneity and time-interval

space-adjacency and distance

similarity and difference

change, tendency, resistance, causal order

(“relations of activity”)

relation between terms that form states of mind

### ***The most intimate relation***

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## Conjunctive relations

connections between experiences that are directly given in personal experience

cf. there is an unavoidable discontinuity in my experience "when I seek to make a transition from an experience of my own to one of yours ... [I] have to get on and off again, to pass from the thing lived to another thing only conceived"

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## Examples of conjunctive relations

*"connections between experiences that are directly given in personal experience"* – as is the relationship:

- between an object's location and its shadow
- between notes of a musical score and keys on a keyboard
- between a name and a pet animal
- between two experiences of the same place at different times
- between experiences of two places on the same journey

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"If from the top of a long cold barren hill I hear the distant whistle of a thrush which seems to come up from some warm woody shelter beyond the edge of the hill, this sound coming faint over the rocks with a mingled feeling of strangeness and joy, the idea of the place about me, and the imaginary one beyond will all be combined together in such a manner in my mind as to become inseparable."

From an essay by Hazlitt (1835)

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## Nature of conjunctive relations

- highly personal in nature
- dependent on context and observer
- operating in the realm of the pre-articulate
- in need of no additional explanation
- having extremely broad semantic content

*... qualities particularly relevant to applying of computing technology in the VF context*

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## James's ontological stance

“Experiences come on an enormous scale, and if we take them all together, they come in a chaos of incommensurable relations that we can not straighten out. We have to abstract different groups of them, and handle these separately if we are to talk of them at all. But how the experiences ever *get themselves made*, or *why* their characters and relations are just such as appear, we can not begin to understand.”

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“We are left ... with a puzzle about the role or sense of 'pure experience'. It is evidently of great importance in James's account, and yet also totally inarticulate. ... [cf.] Wittgenstein 'a nothing would do as well as something about which nothing can be said'. For James's pure experience has to be such that nothing can be said about it, if it is to fulfil the role for which it is cast. ... James refers to the 'speechlessness' of sensations and criticises Green for not simply accepting this.”

Graham Bird: *On the arguments of the philosophers, 1986*

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*Before words ...*

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### **private experience / empirical / concrete**

interaction with artefacts: identification of persistent features and contexts

practical knowledge: correlations between artefacts, acquisition of skills

identification of dependencies and postulation of independent agency

identification of generic patterns of interaction and stimulus-response mechanisms

non-verbal communication through interaction in a common environment

directly situated uses of language

identification of common experience and objective knowledge

symbolic representations and formal languages: public conventions for interpretation

### **public knowledge / theoretical / formal**

## An Experiential Framework for Learning (EFL)

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## From top to bottom of the EFL

- from the private to the public
- from the subjective to the objective
- from the provisional to the assured
- from the particular to the general
- from the pre-articulate to the conceptual and symbolic

*Importance of such transitions evident, but no conception of computing to support it*

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## Understanding backwards

Kierkegaard:

*'we live forwards, but we understand backwards'*

William James:

“Understanding backwards is, it must be confessed, a very frequent weakness of philosophers, both of the rationalistic and of the ordinary empiricist type ...”

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“Understanding backwards” and the EFL

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## James on Kierkegaard

Kierkegaard:

*'we live forwards, but we understand backwards'*

William James:

“Understanding backwards is, it must be confessed, a very frequent weakness of philosophers, both of the rationalistic and of the ordinary empiricist type. [RE] alone insists on understanding forwards also, and refuses to substitute static concepts of the understanding for the transitions in our moving life.”

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## How RE regards knowledge

- RE sets out to relate all knowledge and understanding to its origin in personal experience ...
- contends that all knowledge is ultimately rooted in the perception of conjunctive relations ...
- puts the primary focus on personal, private and subjective activities.

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## Motivating Empirical Modelling

- complementing accounts of experience that are based on words
- privileging personal agency for exploration and experiment
- supplying principles and tools to liberate the personal elaboration of conjunctive relations

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*Empirical Modelling as constructivist computing*

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## Empirical Modelling (EM)

Body of principles, tools and models developed at the University of Warwick over 25 years, primarily through graduate theses and undergraduate projects

For more background, see

<http://www.dcs.warwick.ac.uk/modelling>

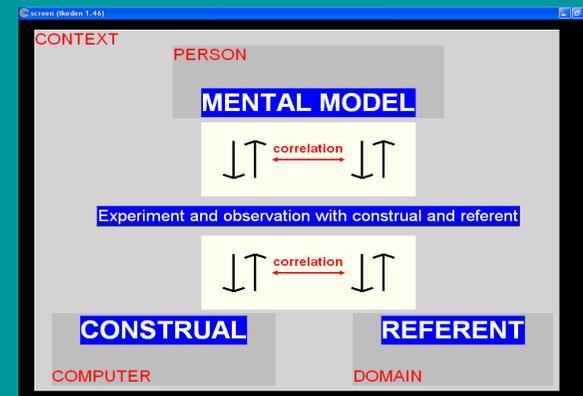
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## Underlying principle of EM

The modeller fashions a conjunctive relation between experience of interacting with a computer-based artefact (to be called the modeller's **construal**) and a complementary experience to which the artefact refers (to be called its **referent**)

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## Model making as *construing*



"an actual focusing of the world at one point in a focus of immediate shining apperany"

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## The Promises of Constructivism

Bruno Latour (2002)

" ... saving constructivism is precisely what I wish to accomplish in this paper : I want to deploy the promises hidden in this confusing concept, promises which are at once epistemological, moral and political - perhaps religious as well. My point is that constructivism might be our only defense against fundamentalism ... "

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## The Promises of Constructivism

Bruno Latour (2002)

" ... [fundamentalism] defined as a tendency to deny the constructed and mediated characters of the entities whose public existence have nonetheless to be discussed. Negotiations toward a viable and peaceful common world are possible among constructivists, but radically impossible if fundamentalists are expected to show up at the diplomatic table - ... "

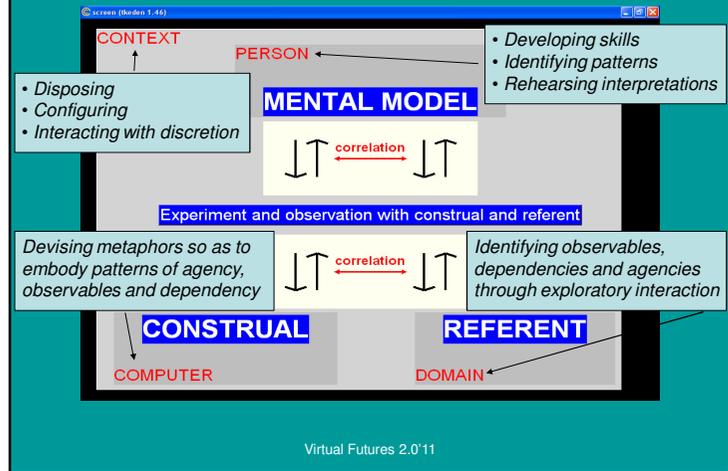
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# The Promises of Constructivism

Bruno Latour (2002)

" - and religion is not the only domain for bigotry : nature can trigger zealots as well, so can markets, so can 'deconstruction'. Between war and peace stands a realistic definition of what a construction is ... "

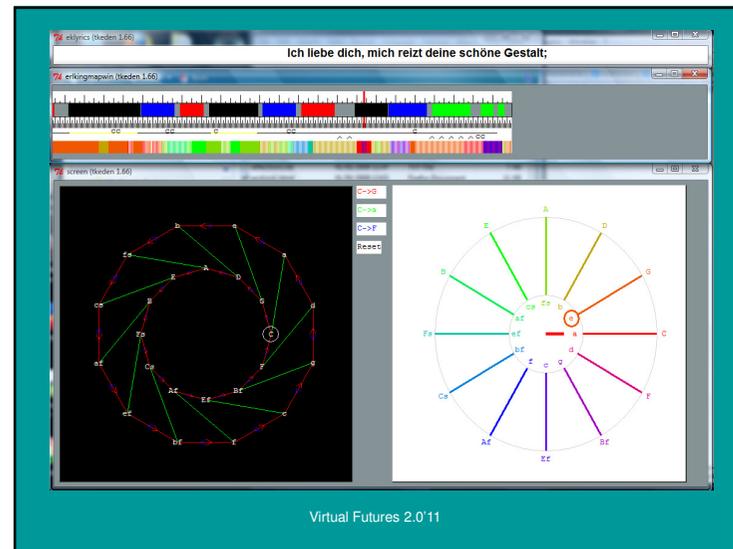
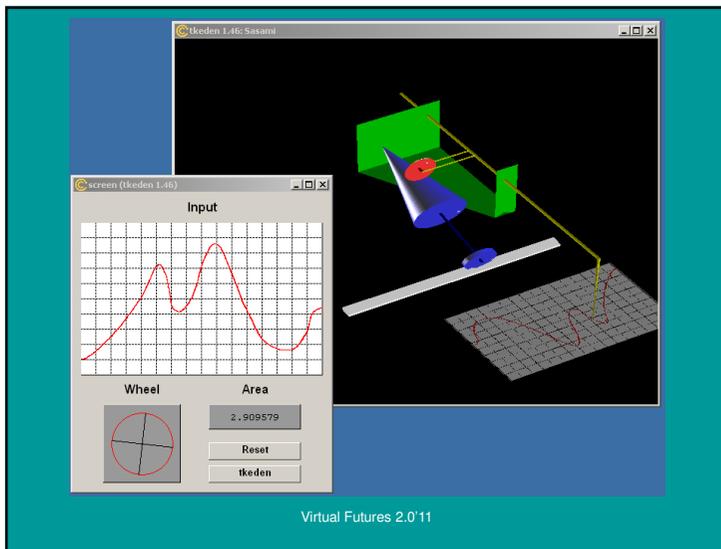
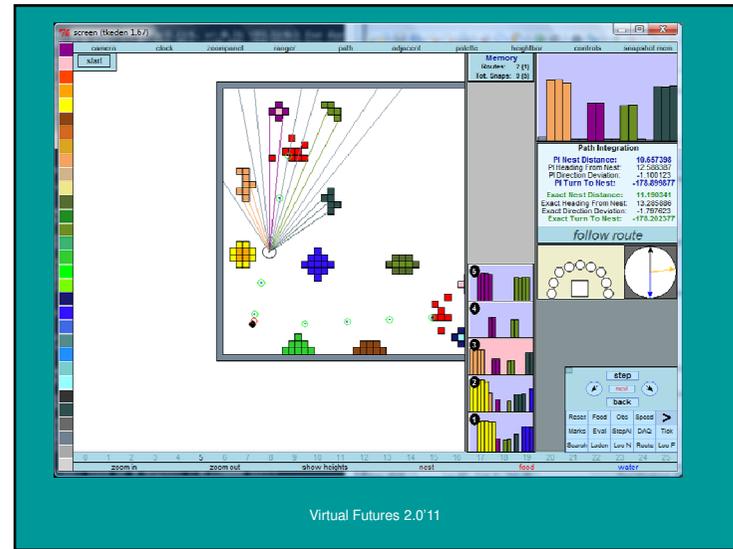
# Model making as *construing*



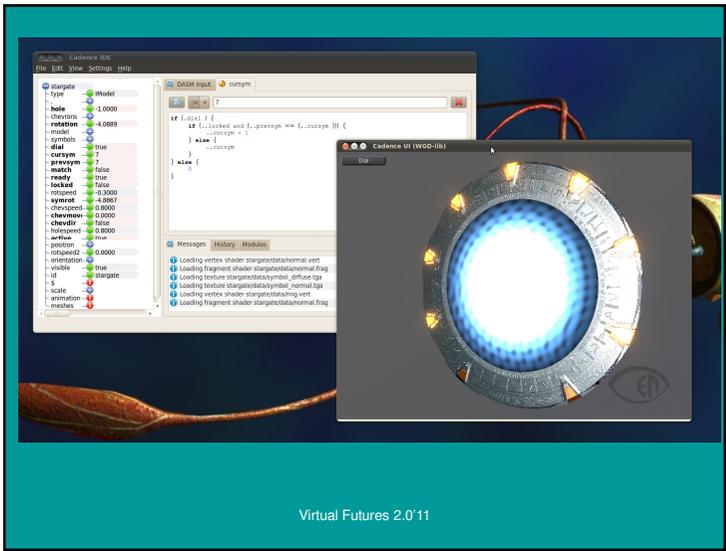
# Examples of EM construals

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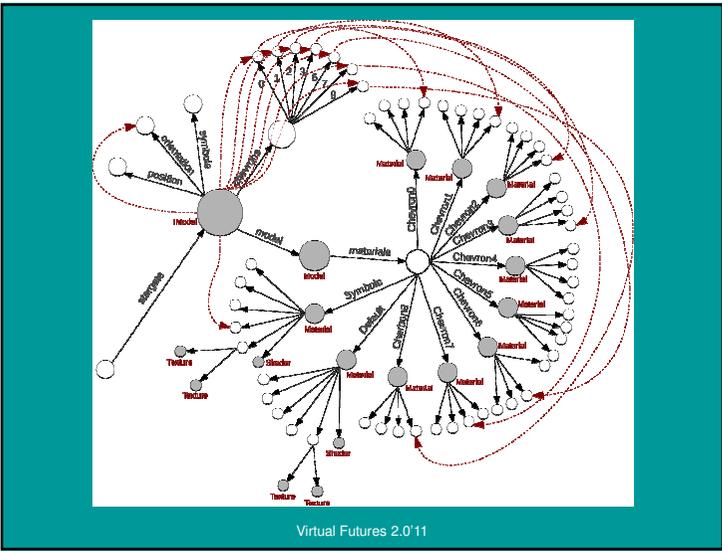
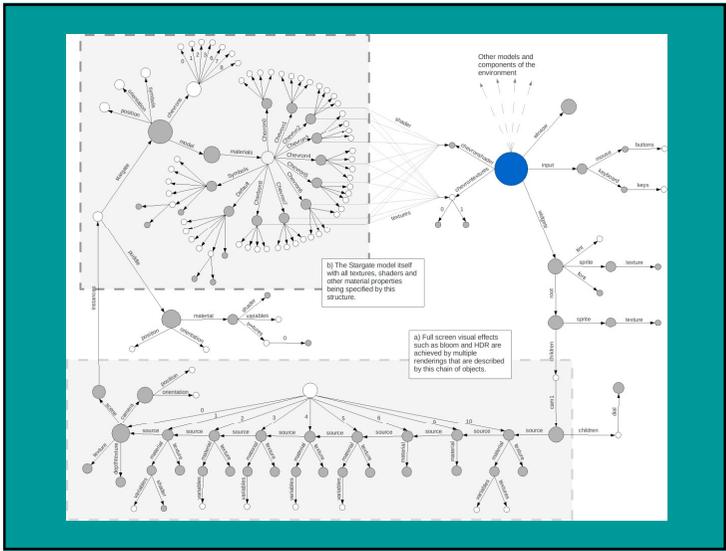
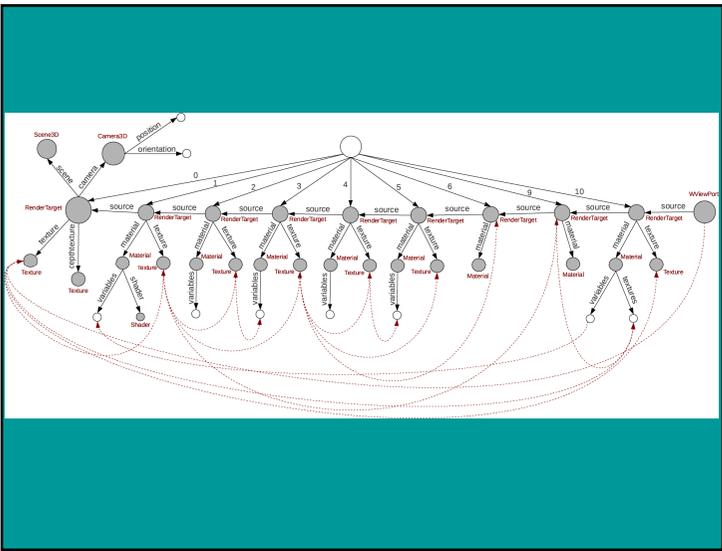
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## New light ...

- Complementing a narrow computationalist perspective on computing
- Both *deriving encouragement from a radical empiricist stance* and *helping to illuminate* such a stance
- Liberating constructivism: redressing the balance between the mechanistic and the human