

Tasks = Data + Action + Context

automated task assistance through data-oriented analysis

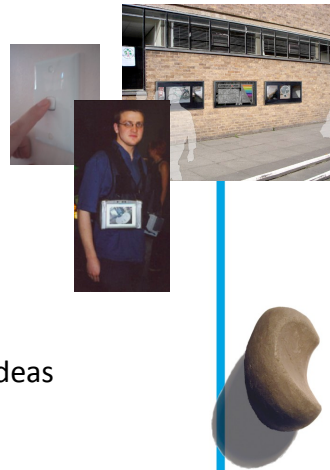
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www.hcibook.com/alan/papers/EIS-Tamodia2008

today I am not talking about ...

- intelligent internet interfaces
fuzzy personal ontologies and
structure from folksonomies
- situated displays, eCampus,
small device – large display interactions
- fun and games, artistic performance,
slow time
- physicality and design, creativity and bad ideas
+ modelling dreams and regret!!





general message

real tasks are complex:

habitual, reactive, considered, situated

some say:

too subtle and too nuanced to model

I have said:

in humility try (Tamodia 2002)

but if it is hard for a human analyst ...

... automated analysis for task assistance ... !!!!!

people

Athens: Akrivi, Costas, Giorgos, Yannis, +++

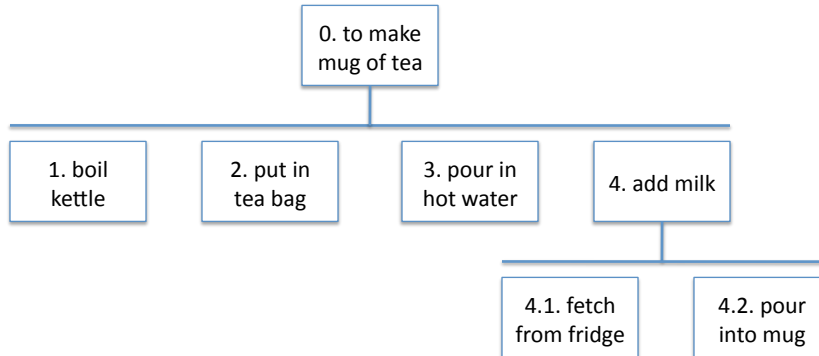
Lancaster: Azrina, Devina, Nazihah, Stavros, +++

Madrid: Estefania, Miguel

Rome: Antonella, Tiziana, +++

plus the old aQtive team

plans ...



Plan 4.

→ if milk not out do 4.1
→ then do 4.2

pre-planned sequence

Plan 4.

if milk not out do 4.1
when milk in hand do 4.2

reactive / environment-driven

kinds of sequenced activity ...

	pre-planned	environment-driven
explicit	known-plan	means-end
implicit	proceduralised / routine / habit	stimulus-response reactive

learning ... but ...

	pre-planned	environment-driven
explicit	known-plan	means-end
implicit	proceduralised / routine / habit	stimulus-response reactive

principle of parsimony

embodied mind theorists:
humans fitted for perception–action cycle

Andy Clark:

“In general evolved creatures will neither store nor process information in costly ways when they can use the structure of the environment and their operations on it as a convenient stand-in for the information-processing operations concerned.”

only do inside your head what you can’t outside of it

representation everywhere

environment

milk in the hand

plans

after pouring tea ...

context

in the middle of preparing grapefruit

Environment

data driven interaction

onCue in action

user selects text

and copies it to clipboard

slowly icons fade in

The screenshot shows a text editor window with a teal background. A purple selection box highlights the word "histograms" in the text: "the dancing histograms very useful a ing out some of the textile sites yo x's page at http://www.hiraeth.com/". A context menu is open over the selection, showing options: Undo Typing (⌘Z), Repeat Typing (⌘Y), Cut (⌘X), Copy (⌘C), Paste (⌘V), and Paste Special... The Copy option is highlighted. To the right, a vertical toolbar contains several icons, including a search icon, a thesaurus icon, and a dictionary icon. The text "slowly icons fade in" is positioned below the toolbar.

kinds of data

- short text – search engines
- single word – thesaurus, spell check
- names – directory services
- post codes – maps, local info
- numbers – SumIt! (add them up)
- custom – order #, cust ref ...
- tables – ...

class of systems 'data detectors'

- late 1990s
 - Intel selection recognition agent
 - Apple Data Detectors (Bonnie Nardi)
 - CyberDesk (Andy Wood led to onCue)
- recently
 - Microsoft SmartTags
 - Google extensions
 - Citrine – clipboard converter
 - CREO system (Faaberg, 2006)
- way back
 - Microcosm (Hypertext external linkage)

} syntactic
/ regexp

} 'semantic'
/ lookup



Snip!t

Snip!t origins



- MSc project 2002 (Jason Marshall)
- studying bookmarking
 - focus was organisation
- exploratory study
 - found users wanted to bookmark sections
- so one evening Alan has a quick hack ... and about once or twice a year since
- now being used for other projects
- live system ... try it out

Snip!t



1
users selects in web page and presses "Snip!t" bookmarklet

2
Snip!t pops up page with suggested things to do with the snip (and saves it for later, like bookmark)

Snip!t

play yourself at www.snipit.org

recognises various things e.g. dates

bringing it together

Kinds of recogniser:

- syntactic – regular expression / patterns / structure
e.g. post code, email address
- lexicon – large look up tables
e.g. countries, internet TLD
- hybrid – popular first names => full name
- +context – telephone number ... what country??

architecture

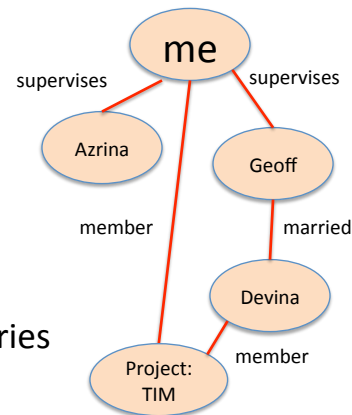


- server-side 'intelligence'
- recognisers + services again
- different kinds of recogniser chaining:
 - from semantics to wider representation
e.g. postcode suggests look for address
 - from semantic to semantic
e.g. domain name in URL
 - from semantic to inner representation
e.g. from Amazon author URL to author name

representation
vs. semantics
very important

personal ontologies

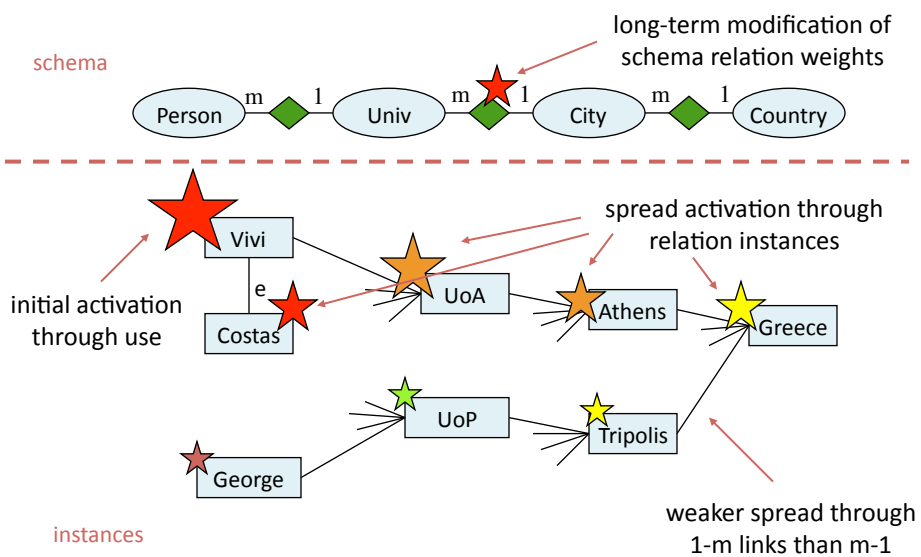
- all use 'general' categories:
 - post code, name, place
- linking to personal ontology
 - users own entities and categories
- how to build?
 - by hand (during useful interactions)
 - automatically (mining files, emails, etc.)
 - e.g. Gnowsis and other semantic desktop projects



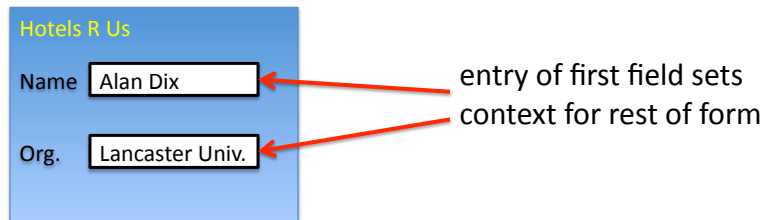
Context

what to do and what to do it to

spreading activation over ontology



context in forms



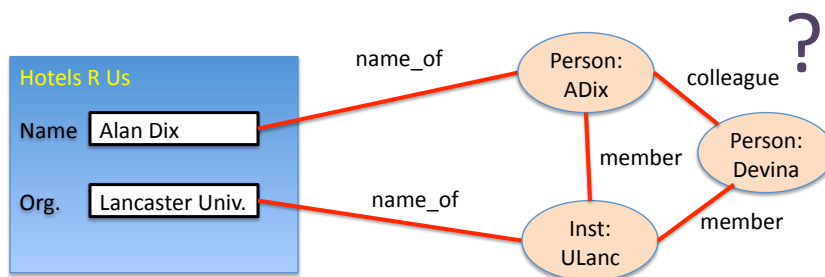
but what is the relationship?

maybe semantic markup on form

– good SemWeb style ... but not very personal

... or more inference ...

context in forms - inference

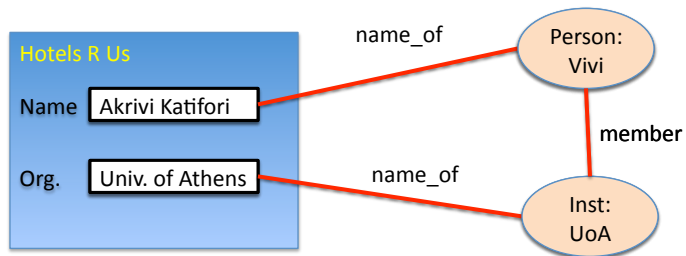


match terms in form to ontology

look for 'least cost paths'

- number of relationships traversed, fan-out

context in forms - inference



match terms in form to ontology

look for 'least cost paths'

- number of relationships traversed, fan-out

later suggest based on rules

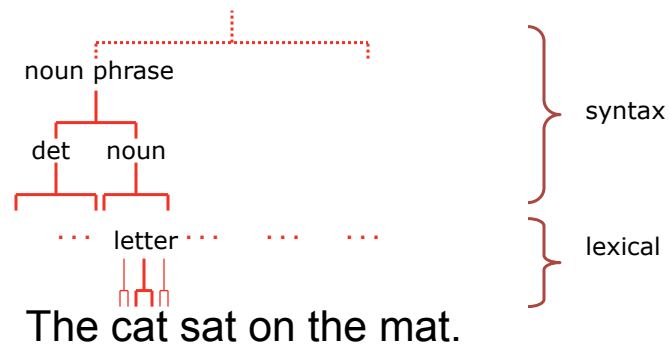
Sequence

from traces to plans

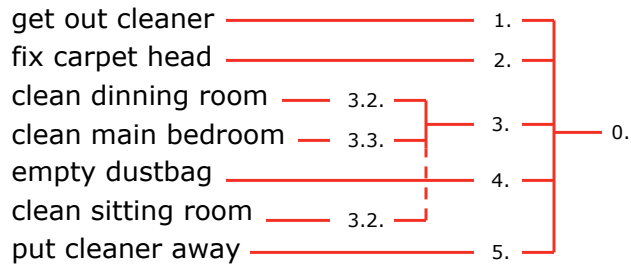
- trace as ubiquitous semantics
- HTA as grammar over traces
- inferring structure over traces

HTA as grammar

- can parse sentence into letters, nouns, noun phrase, etc.



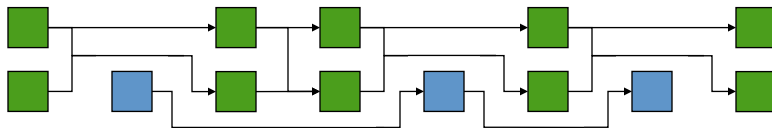
parse scenario using HTA



- 0. in order to clean the house
- 1. get the vacuum cleaner out
- 2. get the appropriate attachment
- 3. clean the rooms
 - 3.1. clean the hall
 - 3.2. clean the living rooms
 - 3.3. clean the bedrooms
- 4. empty the dust bag
- 5. put vacuum cleaner and attachments away

task inference

- long history (lots of work early 1990s)
- limited success
 - interleaved tasks
 - generalisation
- ontology helps :-)
 - input/output links like 'string of pearls'
 - ontology type allows single step learning



how to get links?

- user interaction:
 - drill-down from previous values
- system inference:
 - same form field linking as before

so what?

lessons

- rich interplay: tasks & data
 - => (relatively) easy automated support
- time for intelligence
 - within careful interaction context
 - involve the user
- human task analysis?
 - artefact focus – for analysis and support
 - represent physical artefacts and data
 - => design for the embodied user

c.f. appropriate
intelligence