dialogue notations

what to do when

what is dialogue?

- conversation between two or more parties
  - usually cooperative
- in user interfaces
  - refers to the *structure* of the interaction
  - syntactic level of human–computer ‘conversation’
- levels
  - lexical – shape of icons, actual keys pressed
  - syntactic – order of inputs and outputs
  - semantic – effect on internal application/data
structured human dialogue

- human-computer dialogue very constrained
- some human-human dialogue formal too ...

Minister: do you man’s name take this woman ...
Man: I do
Minister: do you woman’s name take this man ...
Woman: I do
Man: With this ring I thee wed
(places ring on woman’s finger)
Woman: With this ring I thee wed (places ring ..)
Minister: I now pronounce you man and wife

lessons about dialogue

- wedding service
  - sort of script for three parties
  - specifies order
  - some contributions fixed – “I do”
  - others variable – “do you man’s name ...”
  - instructions for ring
    concurrent with saying words “with this ring ...”
- if you say these words are you married?
  - only if in the right place, with marriage licence
  - syntax not semantics
... and more

- what if woman says "I don’t"?
- real dialogues often have alternatives:

  Judge: How do you plead guilty or not guilty?
  Defendant: *either* Guilty or Not guilty

  - the process of the trial depends on the defendants response
- focus on normative responses
  - doesn’t cope with judge saying “off with her head”
  - or in computer dialogue user standing on keyboard!

a simple graphics package

<table>
<thead>
<tr>
<th>File</th>
<th>Graphics</th>
<th>Text</th>
<th>Paint</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Circle</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Line</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Graphics package diagram](image)
state transition networks (STN)

- circles - states
- arcs - actions/events

![Diagram of state transition networks](image)

state transition networks - events

- arc labels a bit cramped because:
  - notation is `state heavy`
  - the events require most detail

![Diagram of state transition networks - events](image)
state transition networks - states

- labels in circles a bit uninformative:
  - states are hard to name
  - but easier to visualise

...   ...

-state transition networks - hierarchical STNs

- managing complex dialogues
- named sub-dialogues
action properties

- completeness
  - missed arcs
  - unforeseen circumstances

- determinism
  - several arcs for one action
  - deliberate: application decision
  - accident: production rules

- nested escapes

- consistency
  - same action, same effect?
  - modes and visibility

state properties

- reachability
  - can you get anywhere from anywhere?
  - and how easily

- reversibility
  - can you get to the previous state?
  - but NOT undo

- dangerous states
  - some states you don’t want to get to
  - e.g. digital watch: time/alarm set, button press for 2 secs
checking properties (i)

- **completeness**
  - double-click in circle states?

```plaintext
Start → Menu  
Menu → select 'circle' 
Menu → select 'line' 
Circle 1 → click on centre 
Circle 2 → click on circumference 
Circle 1 → rubber band 
Circle 2 → draw circle 
Line 1 → click on first point 
Line 2 → click on last point 
Line 1 → rubber band 
Line 2 → draw last line 
Line 1 → draw a line 
Line 2 → double click 
Finish
```

checking properties (ii)

- **Reversibility:**
  - to reverse select `line`

```plaintext
Start → Menu  
Menu → select 'line' 
Menu → select 'circle' 
Menu → select 'graphics' 
Menu → select 'text' 
Menu → select 'paint' 
Main Menu → Graphics Sub-menu 
Main Menu → select 'graphics' 
Main Menu → select 'text' 
Main Menu → select 'paint'
```

?
checking properties (ii)

- Reversibility:
  - to reverse select `line`
  - click

- Reversibility:
  - to reverse select `line`
  - click - double click
checking properties (ii)

- Reversibility:
  - to reverse select `line'
  - click - double click - select `graphics'
  - (3 actions)
- N.B. not undo

example - nuclear control

- missing arcs
- dangerous state?
revised STN

dangerous states

- word processor: two modes and exit
  
  F1 - changes mode
  
  F2 - exit (and save)
  
  Esc - no mode change

  but ... Esc resets autosave
dangerous states (ii)

- exit with/without save $\Rightarrow$ dangerous states
- duplicate states - semantic distinction

F1-F2 - exit with save
F1-Esc-F2 - exit with no save

lexical Issues

- visibility
  - differentiate modes and states
  - annotations to dialogue

- style
  - command - verb noun
  - mouse based - noun verb

- layout
  - not just appearance ...
layout matters

- word processor - dangerous states

- old keyboard - OK

layout matters

- new keyboard layout

intend F1-F2 (save)
finger catches Esc
layout matters

- new keyboard layout

intend F1-F2 (save)
finger catches Esc
F1-Esc-F2 - disaster!