To understand computing technology in broader terms, we need a better understanding of the relationship between reasoning ("logic") and everyday interaction in the world ("commonsense knowledge")

Logic and Commonsense Knowledge 1

I am at a conference in the Netherlands.

I arrive late at night and hardly notice where my room is.

Next morning, I notice that my room is on the top floor.

I walk down to breakfast thinking about my talk later on.

After breakfast I meet two other delegates X and Y.

We get in the lift to return to our rooms.

Logic and Commonsense Knowledge 2

X presses the button for floor 4.

Y says he is on the floor above X, and selects floor 5.

Since the top button is selected, I don't press a button.

We talk as we ascend. The lift stops. The door opens.

The floor numbers aren't clearly marked.

I say to X – 'this must be floor 4' – he gets out.

Logic and Commonsense Knowledge 3

Y and I carry on talking.

When the lift next stops, the floor is still unclear.

I say to Y 'X is on the floor below you; this is your floor'.

Y gets out. I think something is not quite right.

I think 'is this the top floor?' and 'should I get out?'.

I'm unsure, but notice that the button for floor 5 is still lit.

Logic and Commonsense Knowledge 4

I proceed to the top floor which is the next floor, floor 5.

When I get out of the lift, I can't find my room.

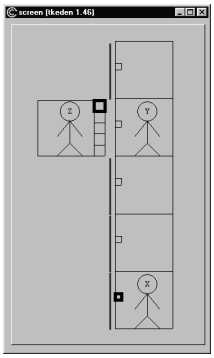
There's no room where my room is on floor 5.

I walk down to floor 4, and pass Y on his way to floor 5.

When I reach floor 4, I meet X coming up from floor 3 …

How did I manage to get all 3 of us to the wrong floor?

Can exploit (computing) technology to construct interactive artefacts for sense-making – following a well-established tradition in science and engineering …



Observables for the lift

```
_button1 = 1;
locX = 1;
locY = 4;
locZ = 0;
_open4 = 1;
_liftfloor = 4;
_car5 = 1;
```


Logic and Commonsense Knowledge 5

Two key facts help to explain our confusion …

1. *Someone called the lift to floor 3 and didn't wait for it to come. I persuaded X to get out at floor 3 thinking it was floor 4.*
2. *I was on floor 4, which was 'locally' the top floor, but the lift was in a part of the building where there were 5 floors.*

Key features of this kind of commonsense scenario …

… key features of commonsense scenarios 1

Dependence on situation …

- User Z makes non-standard use of lift
- Rely on observation ('is this floor 4?')
- Attention is selective ('Y and I ignored lift buttons')

Many varieties of knowledge - and ignorance

- Second-hand knowledge ('Y is a floor above X')
- Implicit "facts" ('rooms don't move, lifts don't jump')
- I remembered information about roof and room

… key features of commonsense scenarios 1

Limitations of reasoning – scope for nonsense

- Lift users reason against the clock ('at top floor?')
- What we experience isn't necessarily consistent
- Guarantees about our facts and rules obscure

Key aspects of Empirical Modelling …

- Exploiting the computer in sense-making
  "making construals"
- Adopting an unusual philosophical stance
  "radical empiricism" – William James (1910)

Other resources

The Empirical Modelling website is at

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

Some examples of models are accessible online at

http://www.warwick.ac.uk/go/webeden