



## Futuris 13 - Interfaces

### SCRIPT IN ENGLISH

1.00 generique

1.08 People talking, demonstrations, translators, sports fans etc

One of our most basic instincts is to talk. At home or abroad, language is our passport to communication.

But what about computers - will they ever talk to us naturally, and help us cross the language barrier?

1.28 SOT Oliver Lemon, Senior Research Fellow, Human Communication Research Centre, University of Edinburgh

"It is artificial intelligence, that's what we do, we've applying techniques that have been developed in artificial intelligence, we're applying those techniques in human computer interaction."

1.39 Virgule "Speak to me" - don't talk

1.43 SOT Jan Sevidy, Manager, Voice Technologies and Systems, IBM Czech Republic

"Every single person speaks very differently, uses different words, they use different expressions, and we have to capture all of that and make sense out of it."

1.55 Virgule "Speak to me" - don't talk

2.00 SOT Johanna Moore, Director, Human Communication Research Centre, University of Edinburgh

"When you're in a situation where you can have your big screen and your keyboard and everything, have them, but there are lots of situations where you won't. There are situations like doing two things at once, driving a car, or cooking dinner - your hands are busy, your eyes are busy, and you want to be talking to the system at the same time. Because everybody multitasks now, people do many many things at once, and so when your hands and your eyes are busy then you want a spoken-language interface."

2.25 Tourists in Edinburgh

Speech is the most natural way for people to interact - and find out information.

But the sheer variety of human language and expression poses a major challenge for computers

A research team at The University of Edinburgh took the example of a tourist information system as they search for a solution.



2.53 Upsound of welcome message

3.00 SOT Oliver Lemon

"The key technology we're using is what's known as machine learning techniques, so what we're trying to do is develop computer programmes that can learn how to have conversations in a perfectly natural way."

3.13 demonstration

The software has to be able to react intuitively to your voice - and be easy to use.

3.34 SOT Oliver Lemon

"In the Talk project we thought that it would be a good idea that for example you're driving your car towards a town you've never been to, you need to book a hotel, find somewhere to eat, that kind of thing, or alternatively you could be a tourist and you've just arrived in a town and you have your mobile phone and you want to find somewhere to eat"

3.59 demonstration

A big problem is helping the computer understand the range of conversational possibilities.

4.07 SOT Oliver Lemon

"It receives rewards and punishments, it does trial and error exploration of all the different possible ways you can have a conversation. It tries certain things out, and if they work it reinforces that way of having a conversation. If a conversation doesn't work out very well - the user slams the phone down or the user starts cursing or something - then the machine gets a punishment and it realises that 'Well, those things that I tried in that conversation were bad'.

4.38 Upsound 'I need a drink'

4.50 setup Johanna Moore

The computer doesn't always get it right.

It needs to understand more than language to master the art of conversation.

4.59 SOT Johanna Moore

"So there's a lot more going on than breaking sentences up into subjects and verbs, and figuring out this is the agent of that action, for example, so there's a lot of other stuff, knowledge of the task, of the domain, that goes into these systems."

5.16 IBM Czech Republic then setup Jan Kleindienst

Tourist information systems are just one example of how the technology could be applied in everyday life.



Computers could also help people overcome language barriers when they travel.

At IBM in Prague Jan Kleindienst is taking part in a project to develop near real time speech to speech translation.

5.44 SOT Jan Kleindienst, Manager, Conversational Architectures and Interactions, IBM Czech Republic

"So what I'm going to show you is actually a video console that will allow a regular European citizen to actually talk to a system in one language and receive a output in the target language. So for example I will demonstrate an English to Spanish language pair."

6.07 Upsound demonstration - don't talk

6.16 SOT Jan Kleindienst

"Overall there are three steps that are part of this process of the speech to speech translation - transcription, translation and synthesis."

6.25 Demonstration

Older systems can only manage very limited tasks.

The aim here is that the computer can translate unrestricted speech in a free environment.

6.34 SOT Jan Sevidy

"So we break down the sounds to very basic sounds called phonemes, and for each language we have a phonetic alphabet, and based on that phonetic alphabet, or basic sounds, we put together the words. So our system can recognise, in double quotes, every word."

6.55 Demonstration with "mistake" at 7.04

Errors or misunderstandings are part of the learning process.

7.09 SOT Jan Kleindienst

"Any algorithm that deals with processing of human input, or generating human output, needs a lot of training data - it's like a baby that needs to learn a lot before its able to speak its first sentence, the same thing is with computers."

7.27 People working with computers

These systems demonstrated in Edinburgh and Prague are in development - they have flaws and restrictions.

But what they are attempting to do is both ambitious and complicated.



#### 7.42 SOT Johanna Moore

"Lots of things have to happen to have a conversation. So I frequently get asked 'when are we going to have Hal', you know the talking computer from 2001, and the thing is a lot of what he does is not about natural language, it's about knowing how the world works, having a lot of common sense, so there's a lot of knowledge representation there, Hal knows a lot of things."

#### 8.10 Virgule computer voice - don't talk

#### 8.14 SOT Jan Kleindienst

"Obviously one limitation for the speech to speech synthesis is the lack of inner understanding of what the subject is talking about. Computers don't understand what you're talking about in terms of the semantics. Only when we're able to actually model semantics and understanding what humans are talking about, then we will see a dramatic step forward."

#### 8.38 Timelapse ICM Czech

Speech recognition technology has been under development for 50 years, and it could take many more before the almost human computers of science fiction films become a reality.

#### 8.55 Generique

#### 9.00 Ends