

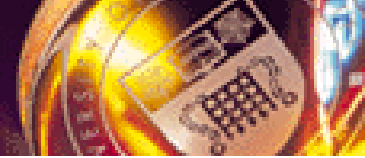


# A.L.I.C.E.: an ACE in Digitaland

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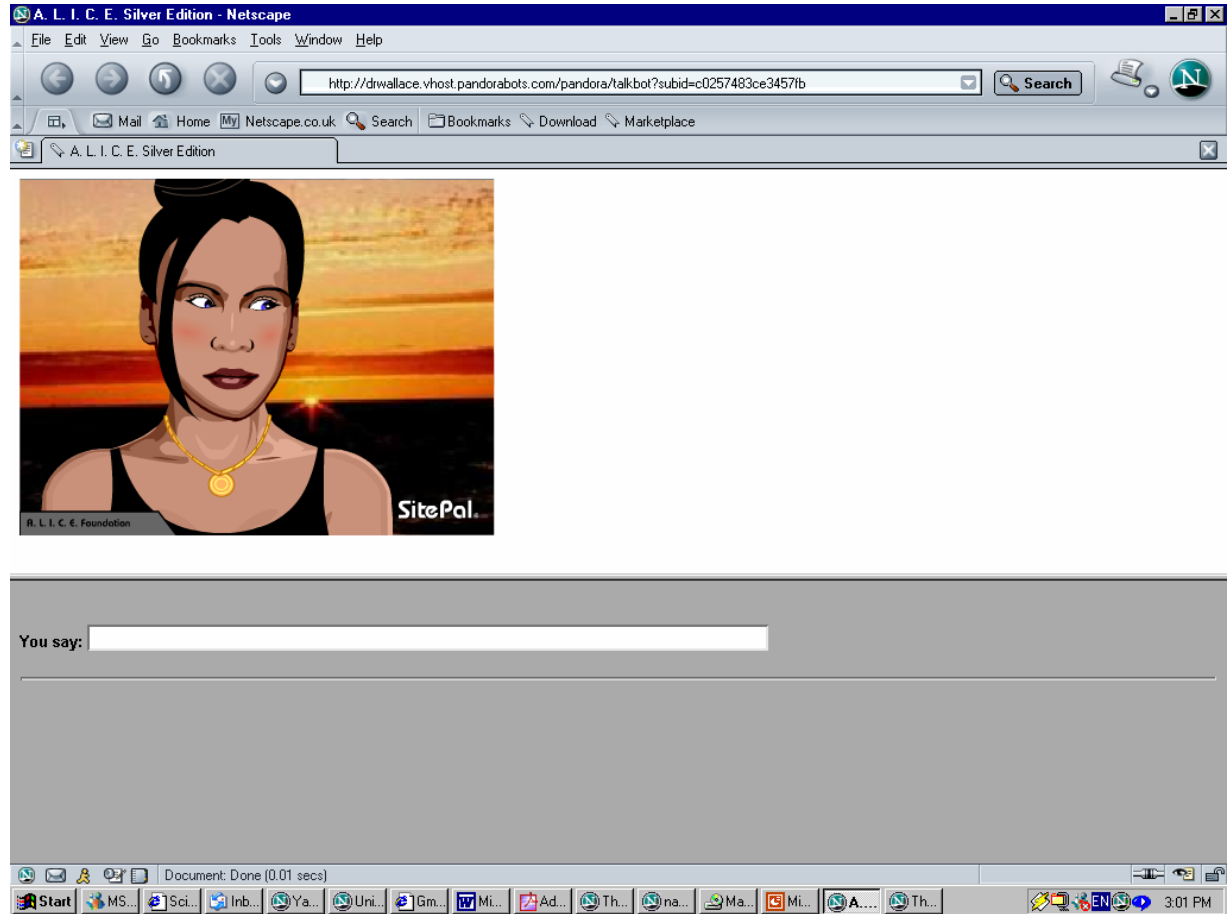


# A.L.I.C.E

Artificial  
Linguistic  
Internet  
Computer  
Entity

(Wallace, 1994)

[www.alicebot.org](http://www.alicebot.org)

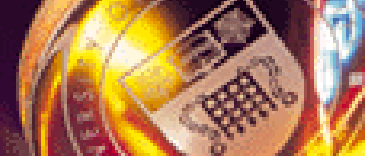


*educating for professional life*



# ACE

- A.L.I.C.E is an artificial conversational entity – ACE (Shah & Henry, 2005)
- a modern *Eliza* (Weizenbaum, 1966)
- Eliza first pre-internet ACE affording human-machine interaction through text-based natural language
- Eliza deceived humans into believing they were interacting with a Rogerian psychotherapist



# ELIZA v ALICE

- Eliza
  - key-word spotting & pattern matching
  - 200 stimulus - response pairs
- ALICE
  - case-based reasoning (CBR) for extraction of correct context of ambiguous words
  - random sentence generator
  - knowledge base (temporal, spatial, etc)
  - spell checker
  - 45,000 stimulus - response pairs



# This paper presents

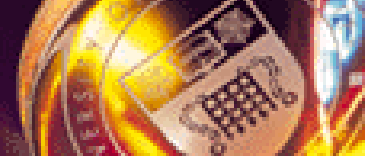
- Comparison of linguistic productivity - *li.p* (Shah & Henry, 2005) between

ALICE  
(computer programme)

&

Confederate4  
(hidden human)

from their respective conversations with Judge1 in  
Loebner's 2004 Contest / Turing's Imitation Game



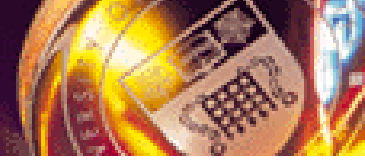
- Turing's (1950) idea: that a machine must be *thinking* and therefore be considered *intelligent* if it, unseen and unheard, can deceive a human interlocutor that it is human, after a five minute conversation

*Computing Machinery & Intelligence*



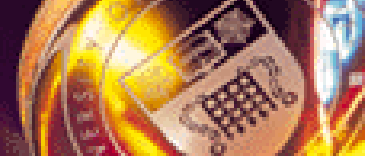
# Turing's Imitation Game

- Operational test for machine intelligence measured through its generated language during conversation
- Instantiated in 1990 - now an annual Contest sponsored by Dr. Hugh Loebner



# ALICE most successful ACE

- 3x winner of Loebner Contest:
  - 2000 50<sup>th</sup> anniversary of Turing's 1950 paper
  - 2001
  - 2004 50<sup>th</sup> anniversary of Turing's death
- 2004 ChatterBot Challenge winner in these categories:
  - Gold medallist for most knowledgeable ACE
  - Bronze medallist for most popular ACE



# Human *lip* media1: speech:

Verbal	Most human communication occurs as speech,	Immediate, contextual, contracted: Im wont don't
problem:	Dialects, 'noise'	Require <i>speech knowledge</i> (Zue, MIT)



# Human *li.p* media2

Non-  
verbal

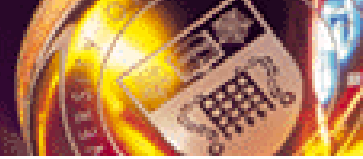
Written:  
grammatical;  
explicit; impersonal;  
objective; longer  
words

e.g. text story  
understanding

**Problem:**

*complex, context*  
knight/night

No programme can  
understand stories  
(McCarthy, 1999),  
beyond information  
extraction  
(Chinchor, 1999)  
i.e. types of  
incidents, etc.



# Human *li.p* media3

Speech	<p>Most human communication occurs as speech</p> <p><i>Dialects, 'noise'</i></p>	<p>Immediate, contextual, contracted: Im; wont; don't; your</p>
Written	<p>Grammatical; explicit; impersonal; objective; longer words</p> <p><i>complex, context</i></p>	<p>I am; I'm; you are; you're; your; knight/night;</p>
Human - Machine text interaction	<p>written, more like speech, i.e. contracted, contextual immediate</p> <p><b>ideal for research</b></p>	<p>im = I am          your = you're /your          u = you; 4u= for you</p> <p><i>educating for professional life</i></p>



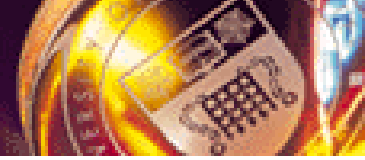
# Loebner 2004:

	ALICE:	Human Judge J1:	Confederate CHH4 (hidden human):
1	[12:26:09] Alice to J1 Hello, my name is Alice and I am the human		[12:26:41] CHH4 to J1 Hello, my name is Ben and I am the human
2		[12:27:55] J1 Hi, Ben. How are you doing?	[12:28:13] CHH4 to J1: Good. I'm having a great time in this land of the absurd



# Opening Sequence

ALICE:	Human Judge J1:	Confederate CHH4 (hidden human):
[12:26:09] Alice to J1 Hello, my name is Alice and I am the human		[12:26:41] CHH4 to J1 Hello, my name is Ben and I am the human
	[12:27:55] J1 Hi, Ben. How are you doing?	[12:28:13] CHH4 to J1: <b>Good. I'm having a great time in this land of the absurd</b>

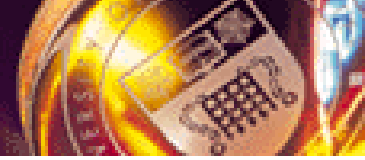


# Confederate Effect

- At this point
  - *Good. I'm having a great time in this land of the absurd*

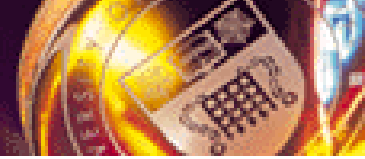
Ben, CHH4 exhibits the Confederate Effect (Shah & Henry, 2005): human discourse considered machine-like

- Phenomenon surfaced in Loebner 1991: female considered *machine – like* for her extensive knowledge on Shakespeare



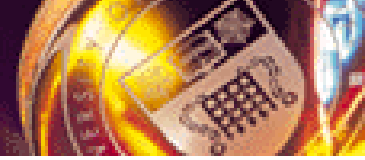
# Reverse of *Eliza Effect*

- tendency to accept ACE responses as more intelligent than they actually are (Turkel, 1997)
- ALICE's second utterance
  - *Hello there. Everything is going extremely well*



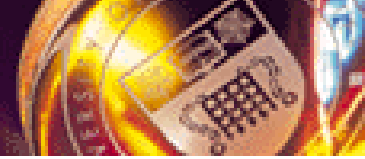
# Continuing ALICE – J1 – CHH4

Line No.:	ALICE:	J1:	CHH4:
3	[12:28:20] Alice to J1 Hello there. Everything is going extremely well.	[12:28:06] J1: Hi Alice, How are you doing?	
4		12:28:26] J1 to CHH4: What is absurd about it?	



# CHH4 explanation of 'absurd'

Line No.:	ALICE	J1	CHH4
4		12:28:26] J1 to CHH4: What is absurd about it?	[12:28:57] CHH4 to J1: Just that this is how I'm making money on a Sunday afternoon. Not the usual way to get some spending cash.



# ALICE and J1:

Line No.:	ALICE	J1	CHH4
5	[12:29:11] Alice to J1 Thanks for the information. My location is New York City. Where are you?	[12:28:50] J1 to Alice: I'm glad to hear it. Where do you live?	
6		[12:29:21] J1 to CHH4: How do you usually spend your Sunday afternoons?	



# ALICE, J1 with CHH4

Line No.:	ALICE	J1	CHH4
6		<p>[12:29:21] J1 to CHH4</p> <p>How do you usually spend your Sunday afternoons?</p>	<p>[12:30:11] CHH4 to J1</p> <p>Depends. Watching baseball, idly walking about New York, sleeping stressing about the oncoming week. It varies</p>
7	<p>[12:30:12] Alice to J1</p> <p>Tell me a little about your life in New York. Ah. Everything I need to know I learned from my instructor</p>	<p>[12:29:38] J1 to Alice:</p> <p>In New York. How did you get here today?</p>	



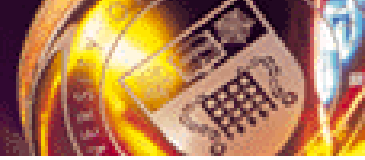
# ALICE, J1 with CHH4

Line No.:	ALICE	J1	CHH4
8		[12:30:23] J1 to CHH4: Where in New York do you like to walk?	[12:31:11] CHH4 to J1: Depends. Watching baseball, idly walking about New York, sleeping stressing about the oncoming week. It varies
9	[12:31:15] Alice to J1: <b>Don't you know? No I do not answer your question first. Do you? I answer a lot of silly questions.</b>	[12:30:44] J1 to Alice: <b>Why don't you answer my question first?</b>	



# ALICE, J1 with CHH4

Line No.:	ALICE	J1	CHH4
10		[12:31:24] J1 to CHH4: What's the best neighbourhoods you've been to so far?	[12:32:12] CHH4 to J1: Washington Heights, Jackson Heights, Astoria
11	[12:31:51] Alice to J1: Yes, please tell me	[12:31:42] J1 to Alice: Do you still want to know about my life in New York?	



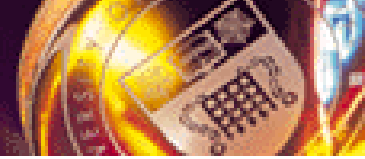
# ALICE & J1

Line No.:	ALICE	J1	CHH4
12	[12:32:43] Alice to J1: You are a grad student and do not have much free time? Do you get to meet a lot of people? What subject are you studying?	[12:32:12] J1 to Alice: I'm a grad student and do not have much free time. I study a lot.	



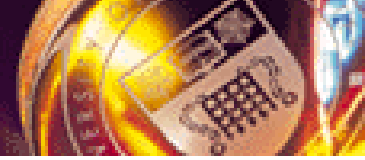
# ALICE & J1

Line No.:	ALICE	J1	CHH4
12	<p>[12:32:43] Alice to J1: You are a grad student and do not have much free time? Do you get to meet a lot of people? <b>What subject are you studying?</b></p> <p><b>CBR mechanism:</b> matches 'study' with <i>subjects that must be studied</i> – rather than a room (study)</p>	<p>[12:32:12] J1 to Alice: I'm a grad student and do not have much free time. I <b>study a lot.</b></p>	



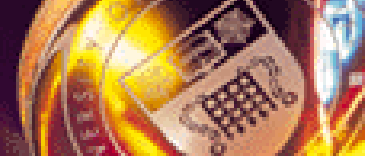
# J1 with CHH4

Line No.:	ALICE	J1	CHH4
13		[12:32:57] J1 to CHH4: Those are great neighbourhoods. There's a great pingpong establishment in J Heights. People change into athletic gear to play	[12:33:38] CHH4 to J1: That sounds awesome. I love pingpong, haven't played much since I moved to New York. I looked at it as more of a suburban rec room kind of thing.



## *li.p* - ALICE

- ALICE could be described as a “vacuous turn-taking dialogue system” (Wilks, 2003)
- However its *li.p* could also be described as that of an autistic person (Harpur, E-CAP 2005)
  - lacks imagination
  - does not disclose personal information, not sharing



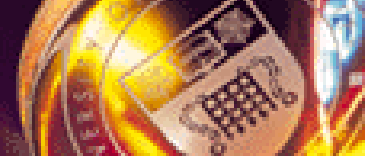
## *li.p* – CHH4 & J1

- The conversation between J1 and CHH4 flows smoothly, after the initial confusion over use of ‘absurd’; both are able to disclose an understanding of real world places and events
- They demonstrate they know what is going on in the conversation
- Both respond to each other with relevant utterances, show interest in pursuing conversation



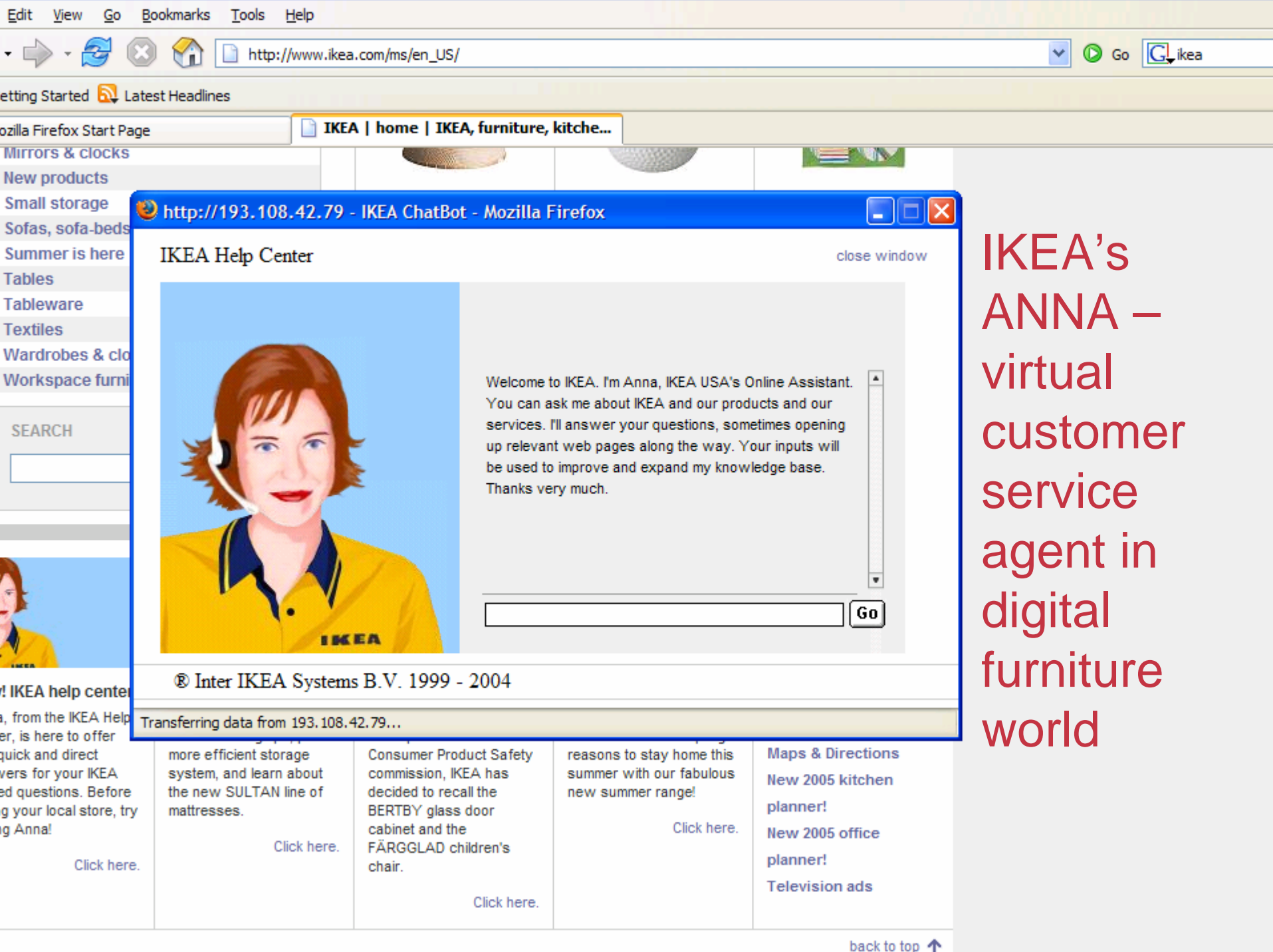
# Flaw in Loebner's Contest

- It is no longer a contest for machine intelligence
- Judges have two options to rate their conversational partner: human or machine
- What if choices were
  - normal adult human
  - human suffering from linguistic impairment
  - child
  - another agent
  - gender of agent
- How would machine be rated if those options were given to Loebner Judges?

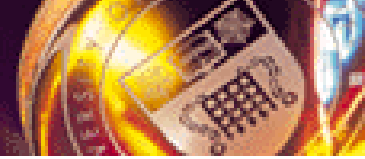


# ACE uses:

- In single, specialised domains
- Such as ‘question-answer’ query systems on Internet sites
- E-bank CAHOOT’s system is an example, another is IKEA’s Anna



IKEA's ANNA – virtual customer service agent in digital furniture world



# ANNA

- Is able to bring up visual display of items from IKEA's on-line catalogue, for instance if asked
  - Anna can you show me some cheap sofas
- However, Anna is not able to give personal information: her opinions of any of IKEA's furniture range



# Conclusion

- Turing's imitation game, affords ACE credibility in task-specific e-domains
- ACE are providing an *alternative* to intelligence in executing those tasks
- Thus in a small way advancing towards true artificial deception