

Intelligent Control  
and Cognitive Systems

brings you...

# Chatbots, Turing Tests and Believeability

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# The Shape of the Unit

- **Robots**, brains and perception.
  - Learning, including evolution, bridges to...
- **Simulations** and societies, social intelligence.
  - Language should be the bridge here.
- **Game AI** and human-like AI. **Today's topic.**
  - Language will come between emotions and consciousness (kind of OK!)

# The Turing Challenge

- How do you recognise when you've achieved AI?
- How often could you tell a man from a woman on IM, (if they were playing to deceive?)
- Could you tell a computer from a woman as often?



Turing, A.M. (1950).  
**Computing machinery and  
intelligence.** *Mind*, 59, 433-460.

# Believability

- **Believability** is associated with **engagement**, **immersion** and **suspension of disbelief**.
- It is **not** the same as **realism**.

# The Archetype

- “Classic” animation maintains engagement despite (or because of) exaggerated gestures and implausible situations.
- (Bates 1994, Blumberg 1998)



# Playing Games

- **Believability** is the goal of computer game characters.
- **Emotional engagement** with characters and narrative **maintains interest**.
- Reminding the player of **artifice** (or boring them) is bad.



# Immersion / Engagement

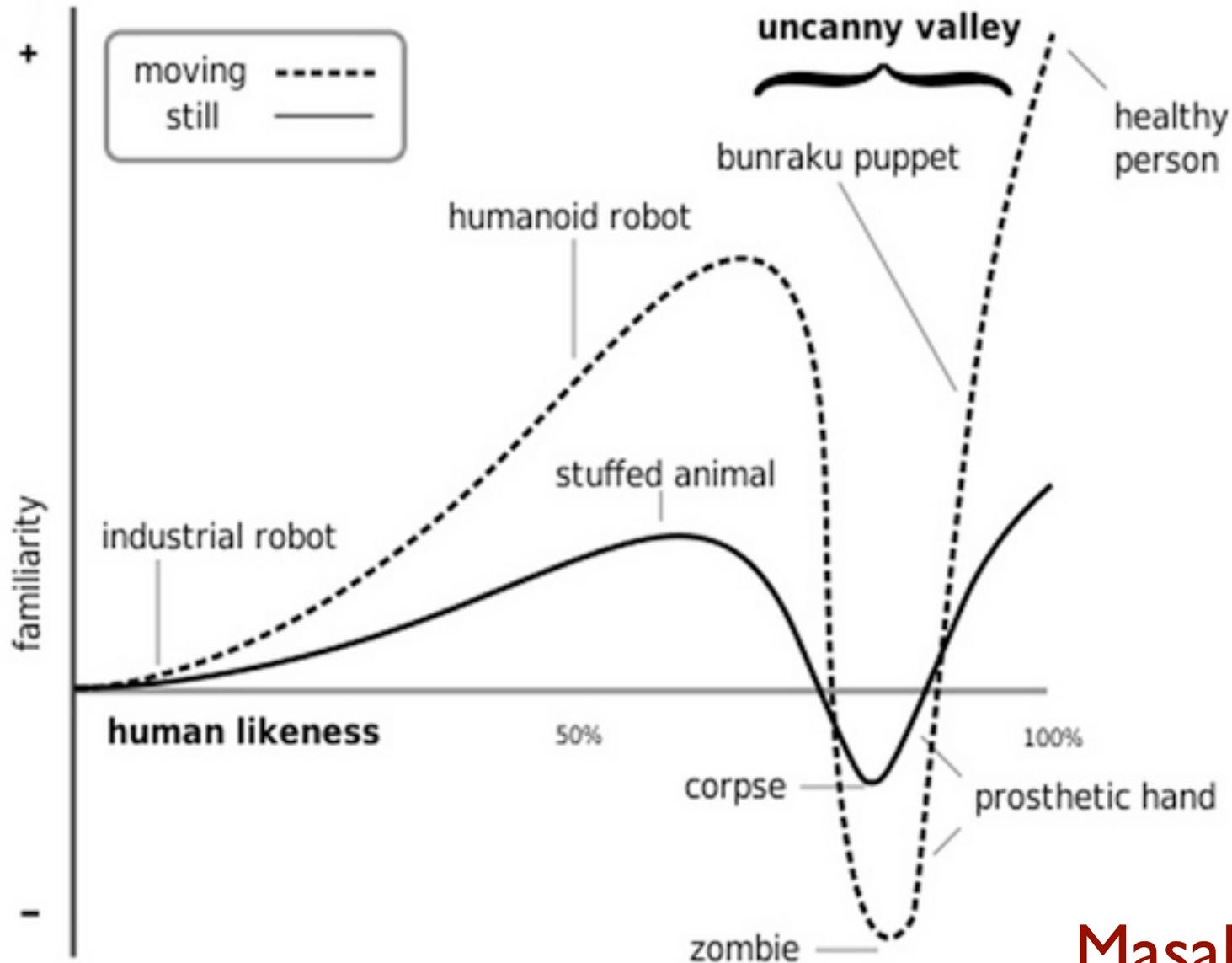
- Forgetting yourself & the media.
- Entirely wrapped in the narrative / action / task.
- Goal for films and novels as well as games and VR.

# Graphics & VR Engagement

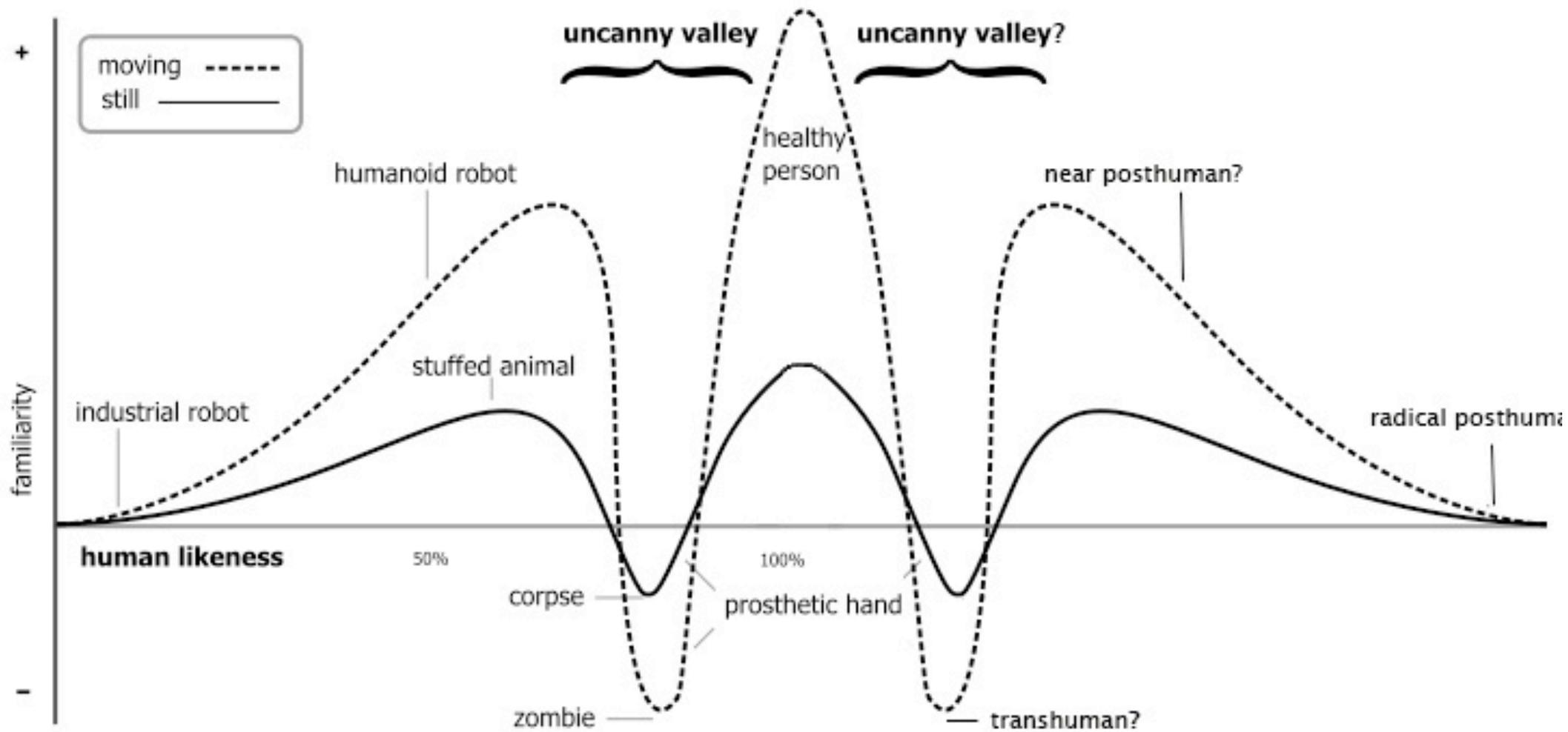


- Frederick Brooks used VR to treat PTSD in Vietnam Veterans.
- Reported that **increasing graphics** quality (photorealism) **decreased** engagement, but **increasing sound** quality **increased** engagement.
- Higher realism in **graphics**  $\Rightarrow$  higher expectations.
  - Fewer glitches in sound?

# The Uncanny Valley



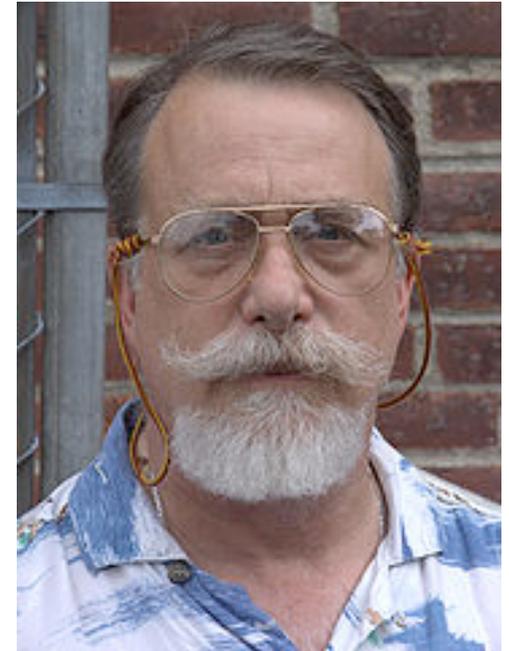
Masahiro Mori 1970



Jamais Cascio (2007)

# Loebner Prize

- Annual competition for passing the Turing Test.
- \$2,000-\$3,000 to the best program per competition.
- \$25,000 for a chatterbot that beats the judges.
- \$100,000 for an AI that wins with video & audio input too (then the contest ends.)



Loebner  
(funds it)

# Strategies That Work for a While

- Misspelling.
- Typing rhythm.
- Getting the other person to talk about themselves (fools many judges.)
- Steering the conversation to a favourite domain.

# Julia

- Written by Michael Loren (CMU).
- Entered into Loebner competition, but “lived” in MUDs.

You say, "julia, how old are you?"

Julia says, "I am 2 years and 9 months old."

You whisper, "julia, how tall are you?" to Julia.

Julia whispers, "I'm 5'1" tall, Lenny."

You say, "julia, describe yourself"

Julia whispers, "I'm 5'1" tall, weigh 123 lbs, with close-cropped frizzy blond hair and dark brown eyes."

You say, "julia, what color are your eyes?"

Julia whispers, "I have dark brown eyes, Lenny."

Age from when written, lives in Pittsburg (home of CMU  
– but doesn't know what state Pittsburg is in).

The rest is fiction, but persistent.

You say, "julia, what color is your hair?"  
Julia whispers, "My hair is frizzy blond, Lenny."  
You say, "julia, what are you wearing?"  
Julia says, "I never really thought about it, Lenny."  
You say, "julia, where do you live?"  
Julia says, "I live in Pittsburgh, Lenny."  
You say, "julia, do you like Pittsburgh?"  
Julia says, "Maybe, Lenny."

You say, "julia, what sex are you?"  
Julia says, "Can't you tell?"  
You say, "julia, what sex are you?"  
Julia says, "Don't you know?"  
You say, "julia, what sex are you?"  
Julia says, "I'm female."  
You say, "julia, what sex are you?"  
Julia says, "I am clearly female."  
You say, "julia, what sex are you?"  
Julia says, "I am female."  
You say, "julia, what sex are you?"  
Julia says, "I'm a woman."

Robyn says, "julia are you a human?"  
Julia says, "Is the Pope Polish?"  
Robyn says, "yes, julia, but are you human?"  
Julia winks at Robyn.  
Robyn says, "julia, are you a computer?"  
Julia is offended by Robyn's suggestion.  
Robyn says, "julia, are you a woman?"  
Julia says, "I am female."  
Robyn says, "and, julia, are you human?"  
Julia says, "Not when I'm having my period, Robyn."  
Robyn laughs

**Only mentions her period / PMS two days a month.**

barry says, "hello, I am barry. How are you today"

Julia says, "Hello, cujmeister."<sup>24</sup>

barry says, "The Jularama, Ha ya doin? What state are you in"

Julia says, "I never really thought about it, barry."

barry says, "What do you look like"

Julia says, "I'm 5'9" tall, weigh 149 lbs, with medium-length platinum blond hair and green eyes."

barry says, "Howdid you answer so fast"

Julia says, "So?"

barry says, "Oh, Iam looking for someone to share secrets with"

barry says, "hello...hello...are you with me"

Julia says, "Hello, cujster."

barry says, "hey woman, how can I eat at the cafe"

Julia says, "I'm sorry I can't help you, my map doesn't seem to work, barry."

“Barry” (not his real **handle**) persists for days...

<sup>24</sup>probably his real handle started “cuj”, thus Julia’s nickname.

Location: 00:40:48 barry's den(#889)(1178)

Present: (11) Bruce Jiro Ken Storm Nepanthe KeyLime mushBaby dav Val bud barry

barry says, "hey is Julia for real or what"

Julia says, "Hello, barry."

barry says, "she says that same stuff every time"

KeyLime says, "It's all macros, Barry"

barry says, "how about filling me in on some of these things...like how Julia can type so damn fast"

KeyLime says, "barry, it's macros"

barry says, "Damn I need to do some programming"

barry says, "im an ant among lizards"

Possibly the all-time greatest quote about AI.

Ethics lecture coming up.

Lara says, "Every time I tried to get more info. out of her, she would tell me not now...later...well, I was never on for the Later."

You say, "Hmm."

Lara was also wondering how such a Hockey fan couldn't know bout the Stanelly cup

Lara says, "Maybe she was just kidding around with me"

You say, "Well, Julia is kinda peculiar in various ways."

Lara says, "I figured...I talked with her once and a few days later she asked me if I was a hockey fan...again"

Lara says, "I told her that she had already asked me that question"

[ . . . ]

Lara says, "anything else you wanna know?"

Lara giggles.

Lara says, "she is a fine convesationalist...if it is about hockey..4"

Lara says, "she has been on a long time...and she is seldomly idle"

Lara says, "I notice that she is almost always on when I jump on."

**Lenny (the researcher) gossips with Lara about Julia**

It was hard for me to follow her conversation. I got frustrated with her for the first couple of minutes. When I found out her secret, I started to have some fun with her. I asked her questions that maybe she had no knowledge of. I tried using slang with her, but she didn't understand what I was saying and would ask me to rephrase the statement. She is very polite. She always says please and thank you.

I was basically patient with her for the first little bit while when I first met her. She did have a problem with her social skills which I tried to be sympathetic to. I did however, try to avoid her after the first couple of encounters when all she did was talk hockey. Until, I talked with you. \*smile\*

**Later: email from Lara**

# What Makes a Believable Character?

- Autonomy [motivation], personalisability [programmability], discourse, risk & trust [delegation], domain [context], graceful degradation, cooperation, anthropomorphism, expectations [natural stupidity] (Foner 1993).
- More recent emphases: episodic memory, emotional continuity, behaviour variation (e.g. Ho & Dautenhahn 2008).

```
else if (MATCH (lcmg, "*are*you*robot*") ||
MATCH (lcmg, "*are*you*a bot*") ||
MATCH (lcmg, "*are*you*an ai*") ||
MATCH (lcmg, "*are*you*autom*") ||
MATCH (lcmg, "*are*you*machine*") ||
MATCH (lcmg, "*are*you*computer*") ||
MATCH (lcmg, "*are*you*program*") ||
MATCH (lcmg, "*are*you*simulati*") ||
MATCH (lcmg, "*you*are*robot*") ||
MATCH (lcmg, "*you*are*a bot*") ||
MATCH (lcmg, "*you*are*an ai*") ||
MATCH (lcmg, "*you*are*autom*") ||
MATCH (lcmg, "*you*are*machine*") ||
MATCH (lcmg, "*you*are*computer*") ||
MATCH (lcmg, "*you*are*program*") ||
MATCH (lcmg, "*you*are*simulati*") ||
MATCH (lcmg, "*you* be *robot*") ||
MATCH (lcmg, "*you* be *a bot*") ||
MATCH (lcmg, "*you* be *an ai*") ||
MATCH (lcmg, "*you* be *autom*") ||
MATCH (lcmg, "*you* be *machine*") ||
MATCH (lcmg, "*you* be *computer*") ||
MATCH (lcmg, "*you* be *program*") ||
MATCH (lcmg, "*you* be *simulati*") ||
```

... and LOTS of  
code.

Julia, early 1990s

# The Real Secret to AI?

## Juergen Pirner

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From Wikipedia, the free encyclopedia

*One sense of Jabberwock disambiguates to here. For the later, two-time winner of the same prize, see [Jabberwocky](#).*

**Juergen Pirner** (born 1956)<sup>[1]</sup> is the German creator of [Jabberwock](#) , a [chatterbot](#) that won the 2003 [Loebner prize](#).

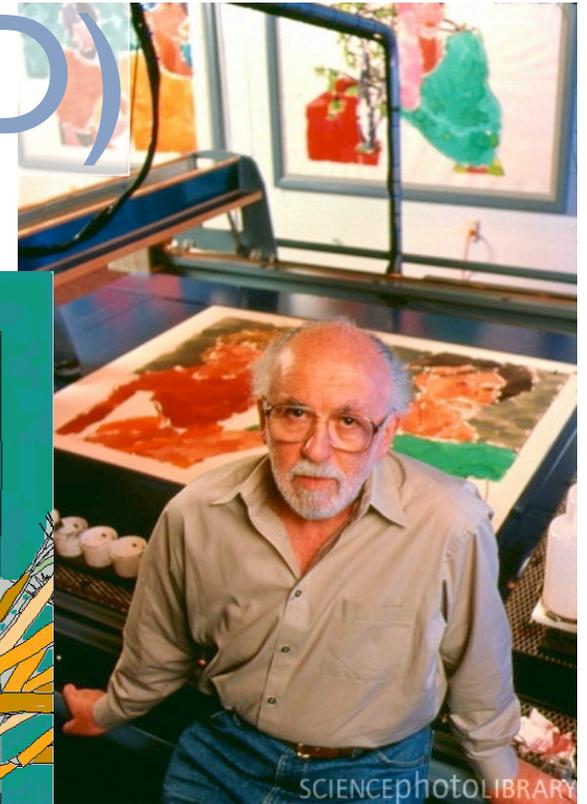
Pirner created Jabberwock modelling the [Jabberwocky](#) from [Lewis Carroll](#)'s poem of the same name. Initially, Jabberwock would just give rude or fantasy-related answers; but over the years, Pirner has programmed better responses into it. As of 2007 he has taught it 2.7 million responses.<sup>[2]</sup>

Pirner lives in [Hamburg, Germany](#).<sup>[1]</sup>

“taught”

# AARON (by Harold Cohen & UCSD)

- Rule-based painting in a particular style (Cohen's).
- Code (and robot) developed over **decades**.



You can download AARON

# My Favourite Application of GA

- Karl Sims (1994)
- Artist working for **Thinking Machines**.
- Worked because of **modularity** (+ supercomputers).



# AI Best Done by Hobbyists?

- Most commercial chess programs built by one person in a garage.
- Can beat most people with a cheap processor.
- NetHack (1987) has some of the best Game AI available.
- Peter Molyneux says it inspired Fable II.

The djinni speaks. "I am in your debt. I will grant one wish!"--More--



Foosh the Peregrinator St:18/07 Dx:17 Co:18 In:15 Wi:11 Ch:17 Neutral S:252205  
Home 1 \$:0 HP:132(132) Pw:56(56) AC:-4 Xp:13/51018 T:44408 Burdened

# Basic Dialog

- Default behaviour should be clever.
  - Not too redundant (stochastic?)
  - Encourage other to drive conversation (ask them questions about themselves).
  - Check if it's time to “leave”.
- Can also use regular expressions to recognise fixed situations and reactively respond: production rules.

# Template Matching & Memory

- Recognise context, grab info, use later.
  - e.g. “my name is \$NAME”
  - “My name is HAL, what’s yours?” \$NAME
- **Eliza (and progeny):** reacts to keywords, uses standard sentences, repeats back what you have said a little while earlier.

# Abuse

- “My name is HAL, what’s yours?” \$NAME – obvious hacks (or just errors) here.
- Many people enjoy abusing robots.
- **Ignoring** (failure to detect) can be a serious problem in a learning bot, seen as unacceptable to the brand of some customers.

# Believability Issues

- Emotion transitions.
- Goal transitions / motivations. (Sengers 1999)
- Probability of repeating actions.
- Probability of doing low utility actions. (Evans 2009)
- Remembering too little or too much.
- Interest, character, narrative.

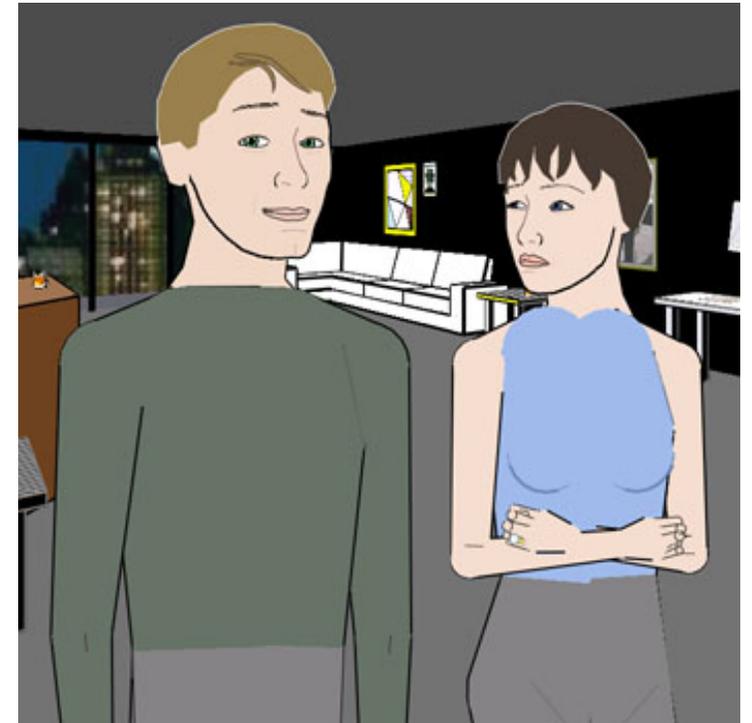
# Oz Group Guide to Believability

- Rich personality: many actions oriented towards expressing this.
- Emotions: obvious in self, meaningful & of concern in others.
- Change: happens, within constraints of personality.
- Social Relationships
- Illusion of Life

# Oz Group Guide to Illusion of Life

- Pursuing multiple, simultaneous goals and actions (Mateas uses BTs).
- Having broad capabilities (e.g. movement, perception, memory, language), and
- Reacting quickly to stimuli in the environment.

Mateas (1997)



Façade (2005) on-line  
interactive drama.

# Summary

- Three different concepts: Believability, Realism, Immersion.
- Believably human-like AI may be about big coding (or big data...)
- So might real human intelligence.