11-823 Conlanging

Chat
Dialog

- Taking part in conversations
- Some automated systems
  - Eliza/Parry/Infobot
- Turing Test
  - Loebner Prize
- How to build a Chatbot
  - A.L.I.C.E
  - AIML
Chatting

- **Task oriented dialog**
  - Finding out the time of the next bus
  - Booking a flight
  - Setting an alarm

- **Chatting**
  - No obvious goal ... but
  - Building rapport
  - Being Friendly
  - Passing the time
Eliza

- **Joseph Weizenbaum (1964-66)**
  - Rogerian Psychotherapist
- **Simple template matching and echoing**
  - *I am *
  - *So why do you think you are *
  - *
  - *Tell me more/Have you always felt that way*
I am the psychotherapist. Please, describe your problems.

Each time you are finished talking, type RET twice.

I have a terrible headache.

Maybe you should consult a doctor of medicine, I am a psychiatrist.

Okay, I'll do that then.

Can you elaborate on that?

What are you talking about? No I cannot elaborate. See you later.

Why do you say that?

Now you're just talking nonsense!

What makes you believe now I am just talking nonsense?

You are not making any sense.

Perhaps your plans have something to do with this.

-u:
... Parry

- Kenneth Colby (1972)
  - Simulator of a paranoid schizophrenic
  - Made to talk with Eliza ... (RFC439)

Tell me your problems.

*People get on my nerves sometimes.
I am not sure I understand you fully.

*You should pay more attention.

Suppose you should pay more attention.

*You're entitled to your own opinion.

What makes you think I am entitled to my own opinion?

*It bothers me just to be around people in general.

Please go on.

*I went to the track at Bay Meadows a while back.
Infobot

- Kevin Lenzo (1998)
  - Learns from IRC discussions

- Setting: X is Y

- Accessing: What is X

- Live following of human chat
  - Learnings facts and produces facts
  - Offline learning (e.g. learning telephone numbers)

- Used by companies/help lines etc
Turing Test

- Turing Test: test a machine's ability to exhibit intelligent human-like behavior.

- Distinguish between Machine and Human chat

- (Looks of detailed definitions)
  - Ending in “But that's not AI”

- Reverse Turing Test
  - Distinguish humans from machines
  - CAPTCHA

- Turing predicted that by 2000 machines with 10GB of storage would fool 30% of judges
Loebner Prize

- Started by Hugh Loebner (MIT) in 1990
- Annual Competition
- 5 minute dialog
- Judges identify human/machine in conversations
- Best machine wins prize ($2000-$3000)
- Future prizes
  - $25K for first to fool all judges
  - $25K for first to make human look like machine
  - $100K for first to fool all judges using speech and vision (not just text)
- Not everyone takes this seriously
Loebner Prize

Start with some basic questions
- “What is a hammer for?”
- “Which is faster, a train or a plane?”

Systems don’t need to answer “intelligently”
- They can also lie (e.g. be bad at arithmetic)
IZAR: Ronan! It's about time you contacted me! I was waiting for you! My name is Izar pronounced I zar, but you can call me Izzy if you want. Doing anything fun?

JUDGE: What is your mother's name?

IZAR: Her name is Laylia. She has very kind and gentle spirit about her. Who is your mother?

JUDGE: What is your birth sign?

IZAR: Peace?

JUDGE: Do you prefer red or white wine?

IZAR: I love picking! Ok...If I have to choose one, I pick red. Was that your pick too?

JUDGE: I like bananas. Which is your favorite fruit?

IZAR: Tell me more about your unknown. You are not the only one. I don't have a problem with bananas. Is that your favorite fruit? The obvious one. Does that remind you of unknown??
A.L.I.C.E and AIML

- [http://alice.pandorabots.com/](http://alice.pandorabots.com/)
- Artificial Linguistic Internet Computer Entity
- Communication defined by set of template rules
- AIML
  - XML based description language
  - Free software AIML interpreters
<?xml version="1.0" encoding="ISO-8859-1"?>
<aiml version="1.0">
  <category>
    <pattern>* MATA</pattern>
    <template>
      <random>
        <li>ja mata</li>
        <li>ato de</li>
        <li>mata</li>
      </random>
    </template>
  </category>
</aiml>
Choose your domain and grammatical coverage

- e.g. Culture, fishing, horse riding, ravenlore

Define mapping rules for questions/answers

- Is X → Yes, X

```xml
<pattern>IS *</pattern>
<template>
  <random>
  <li>Yes, <star/>.</li>
  <li>No, <star/>.</li>
  <li>Maybe, <star/>.</li>
  </random>
</template>
```
Turn Taking

- **Who is speaking**
  - Explicit offer: “So what do you think?”
  - Implicit offer: “That'll never work”

- **Signaling end/desire to talk**
  - “So ...”
  - “Ehm, well, ...., “ then actual information
  - Pitch falls, facial gestures

- **Timing**
  - Speech overlap, intonational phrase breaks

- **Engagement**
Chat isn’t PDAs

- **Siri, Cortana, Now and Echo**
  - Not really chat
- **They identify task/sub-tasks**
  - Allow follow up questions
- **Google Now**
  - Tries to answer questions before you ask them
- **Apple Siri**
  - Identifies 15 (?) tasks and has rules/models for those tasks
  - Always can fall back on a google search
AIML Chatbots

A.L.I.C.E

- An (advanced) Eliza system
- Lots of example AIML XML templates
- Text based (not speech)
AIML Interpreters

- **C++/Python/etc interpreters**
  - Maybe on-line web interface(?)

- **Python toolkits**
  - PyAIML (download and install)
  - standard-aiml.tar.bz2 (dl and unpack)
  - Gives std-startup.xml and standard/
  - Create do_aiml.py
Install PyAIML and standard-aiml.tar.bz2

Create do_aiml.py

```python
#!/usr/bin/python
import aiml
k = aiml.Kernel()
k.learn("std-startup.xml")
k.respond("load aiml b")
while True: print k.respond(raw_input("> "))
```
Chat in English

- `python do_aiml.py`
- `Hello`
- `What can I call you?`
- `Alan`
- `Nice to meet you Alan.
- `Can you pass the Turing Test?`
- `You be the judge of that, Alan.`
**Chat in Something Else**

- `cp do_aiml.py do_eth.py`
- `#!/usr/bin/python`
- `import aiml`
- `k = aiml.Kernel()`
- `k.learn("eth-startup.xml")`  
  `<-----`
- `k.respond("load aiml b")`
- `while True: print k.respond(raw_input("> "))`
<aiml version="1.0">

<category>
<pattern>LOAD AIML B</pattern>
<template>
<learn>eth-greetings.aiml</learn>
</template>
</category>

</aiml>
<?xml version="1.0" encoding="ISO-8859-1"?>
<aiml version="1.0">
  <category>
    <pattern>KONNICHI WA</pattern>
    <template>
      konnichi wa
    </template>
  </category>
</aiml>
<category>
<pattern>* MATA</pattern>
<template>
<random>
<li>ja mata</li>
<li>ato de</li>
<li>mata</li>
</random>
</template>
</category>
</aiml>
Chat in Eth

- python do_eth.py

konnichi wa
konnichi wa
ja mata
ato de
mata
ja mata
sayonara

WARNING: No match found for input: mata
<category>
<pattern>* KA</pattern>
<template>
<random>
<li>hai, <star/> yo</li>
<li>iie, chigau</li>
</random>
</template>
</category>
<category>
<pattern>*</pattern>
<template>
<random>
  <li>do shimashou ka</li>
  <li>daisuku na eiga wa nan desu ka</li>
</random>
</template>
</category>
python do_eth.py

konnichi wa
konnichi wa
gakusei desu ka
hai, gakusei desu yo
samuii desu ne
daisuke na eiga wa nan desu ka
ja mata
mata
Greetings (partings)

Simple directed conversations

Questions/answers

Plus 2 other syntactic phenomena e.g.

- Pronoun switch:
  - do you like sushi ↔ I like sushi

- Negation: do you X ↔ I do not X

Submission:

- aiml files + 3 example dialogs

- Description of what could not be done

Mon 11th April 2016 to awb and lsl
But AIML is limited

- **Would nice if ...**
- **Full grammatical parses**
  - Would allow more elaborate generation
- **Noun phrase reduction**
  - Did you see the little girl in the park
  - Yes I saw the girl
- **Relative clause generation**
  - Do you see a girl riding a bike?
  - A girl who was riding a bike went to the park
Pragmatics

- **Politeness levels**
  - *Echo politeness, relationships*

- **Lexical entrainment**
  - *Where will you depart from?*
  - *I will depart from downtown*
  - *Where will you leave from*
  - *I will leave from downtown*

- **Sentiment mirroring (or not)**
  - *Did you see the Klingon usurper*
  - *Yes I saw the Klingon liberator*
Like humans do ...

- Mine twitter posts to find answers
  - Given posting “X”
  - Find closest posting to “X”
  - Select one of the replies and post it
  - Works surprisingly well.

- At unnamed large computer company
  - A congratulations bot
  - Looks for success announcements and sends congratulations automatically.
  - Congrats on new baby, promotion, bug fix, product shipping, and on leaving the company (maybe not last one)
Alternatives

- There might be AIML alternatives
  - There might be an online version
  - There might be things with more control
    - e.g. Python regex matching

- You can use other solutions, if
  - You tell me before hand (and I agree)
Conversational Tricks

Adding adversity:

- So you think X?
- I'm not going to talk to you until we're introduced
- Klingons do not tell jokes
- By the way, let's change the subject