

# Multi-turn Context Sensitive Exchanges: They change the game

Presented:

MobileVoice 2012, San Francisco CA, March 14, 2012



**Emmett Coin**  
*Industrial Poet, CEO*



Mobile Voice 2012

# Who Am I?

- Emmett Coin
  - Speech Scientist
    - Advanced conversational (dialog) systems
    - Technology Expertise:
      - Embedded/wearable/harsh-environment
      - Multimodal Dialog engine architecture and design
  - Industrial Poet
    - Rugged solutions
    - Compact and elegant methodology
    - The power of the spoken word
    - The naturalness of human-computer interaction



# What Is “” Talk

- ejTalk is pronounced “edge talk”
- We address the task of managing intelligent multi-turn conversations with the machine.
- I have been involved in this endeavor for about two decades.
- Those who have seen my past presentations at Mobile Voice and other conferences already know about "Cassandra".
- You may see a lot more of her.

# Is “This” Time the Time?

- Seems like now is the time that the public is ready to accept conversational interaction with intelligent systems.
- Infrastructure is finally in place to capture, process and synthesize natural human speech quite well.
- It takes generational time scales for humans to embrace fundamental new behaviors
- This latest generation thinks it is natural and obvious that one should gesture and speak with their devices.
- And (not the least of the reasons) some of us have begun to think about "true conversation".
- BUT ... just yesterday a person in New York sued Apple for “intentional” and “negligent” misrepresentation.

# Context is Key

- Some recent commercial systems have been “nodding” in the direction of conversation.
- Most of us have tried Google voice search and who hasn’t heard about Siri.
- Both of these are good small steps toward a conversational interaction because they allow you to say something reasonably naturally.
- They try to figure out what you meant and generate a response.
- For the most part these systems are just query/answer paradigms and with some minor exceptions make no serious attempt to keep context.
- BUT context is a BIG PART of any real conversation.

# What I will talk about

- A very brief overview of how this technology is being integrated into commercial projects today.
- A short description of a Stone Soup like approach to advanced dialog with the AVIOS Advanced Dialog Group.
- A look at challenging demonstration of this technology “in the wild”. Or, how we might “raise” the synthetic agent we really want.

# What commercial products plan to use “real” conversation?

- There are a range of conventional applications (read: funded money making ventures) that will become much better with true conversational technology.
- These ventures are currently being stealthy so we can't talk about them right now. When money is involved everyone gets all secretive, sorry.
- But some examples ...

# Some “real” things that converse?

- New Interactions is a funded stealth mode startup with very big goals to “naturalize” a very common human activity.
- Synthetic educators: One specific case is a “doctor” that can explain the issues of diabetes to lay people.
- Virtual greeters: One example is a bank that wants to let potential customers explore services offered.



# Stone Soup

(and the AVIOS Advanced Dialog Group)

- The Advanced Dialog group has long had as a goal to foster and promote ways to build more natural and sophisticated dialogs.
- Certainly one part of the “conversation” problem is ASR and TTS. And the AT&T Mashup provides a nice solution to that.
- ejTalk is in the process of making the ejTalker conversation engine available to the Advanced Dialog Group.



# AVIOS Advanced Dialog group

- Working directly with AVIOS group to make this technology available for experimentation.
- The ejTalker conversation engine is an implementation of an interpreter of an XML-based conversation definition language.
- One of the goals of the advanced dialog group is to explore requirements and formalisms for a next generation multi-modal interaction engine.
- ejTalk will work toward implementing any promising new functional specifications that the group comes up with (in a continuous virtuous cycle).
- The hope is that the needs and explorations of this group will suggest solutions that others could provide solutions to.



# Cassandra the Candidate

**ejTalk** Presents ...



**Cassandra the Candidate!**



or type something here ...



**Understood:**  
**Said:**

Cassandra wants to be a .....

## Candidate

- It's difficult for new technologies to be experienced by large sectors of the public.
- Apps are targeted towards specific domains (e.g. stocks, email, etc.)
- Even if the application is great it is only used by a small group.
- Just for fun, ejTalk thought it might be entertaining and educational for the general population to "play around with" this technology in a non-demanding (slightly kitschy) way.
- Cassandra has begun her debate prep and is preparing to talk to you about why she should be the first ever synthetic agent to be President.
- She is new to politics and you can expect her to be a little "rough around the edges".
- You can expect her to get better as she goes.
- Vote Cassandra!



# Advanced Dialog Design is just....Debate Prep?

**ejTalk Presents ...**



**Cassandra the Candidate!**



or type something here ...

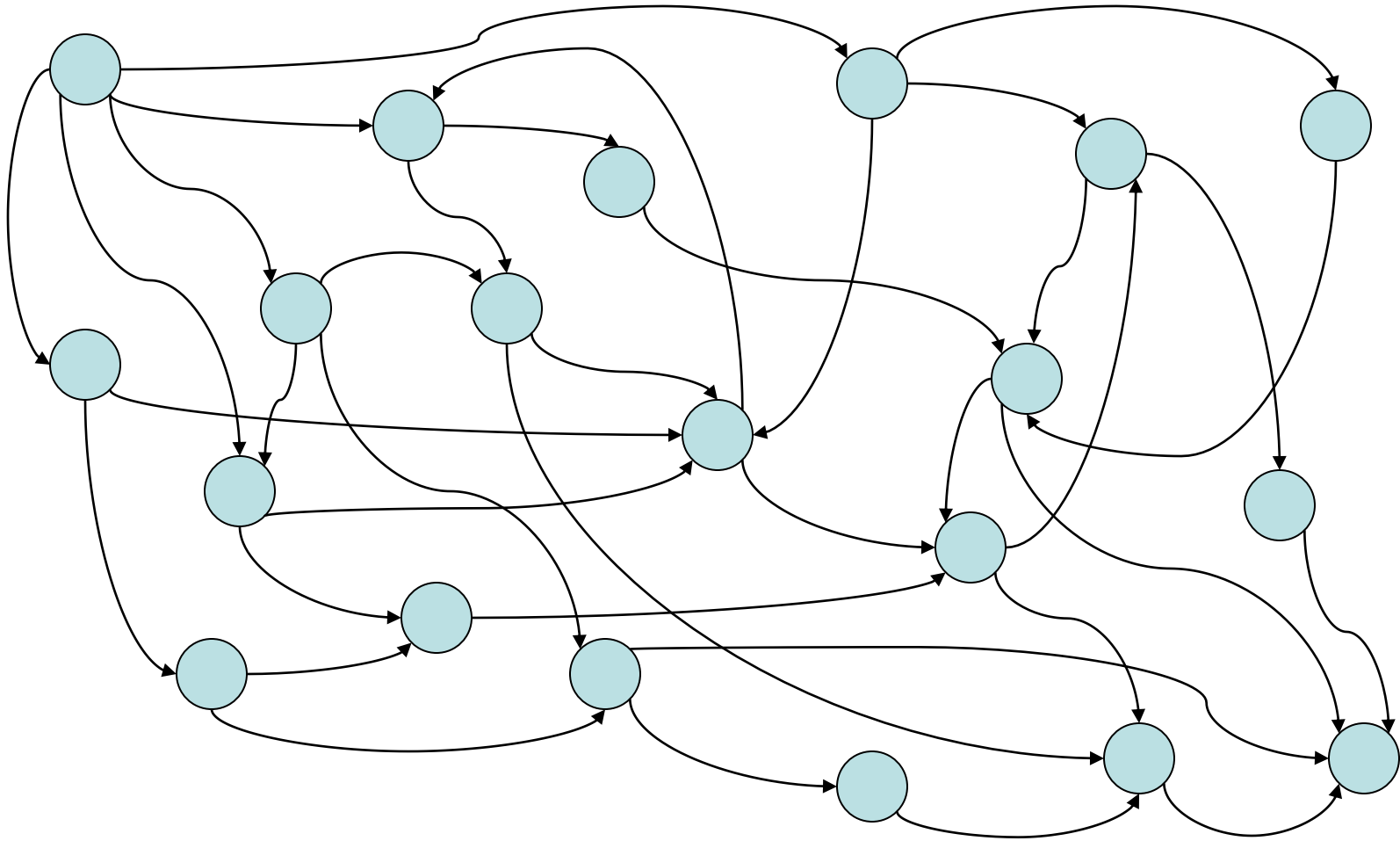


**Understood:**

**Said:** Hi, Cassandra here.

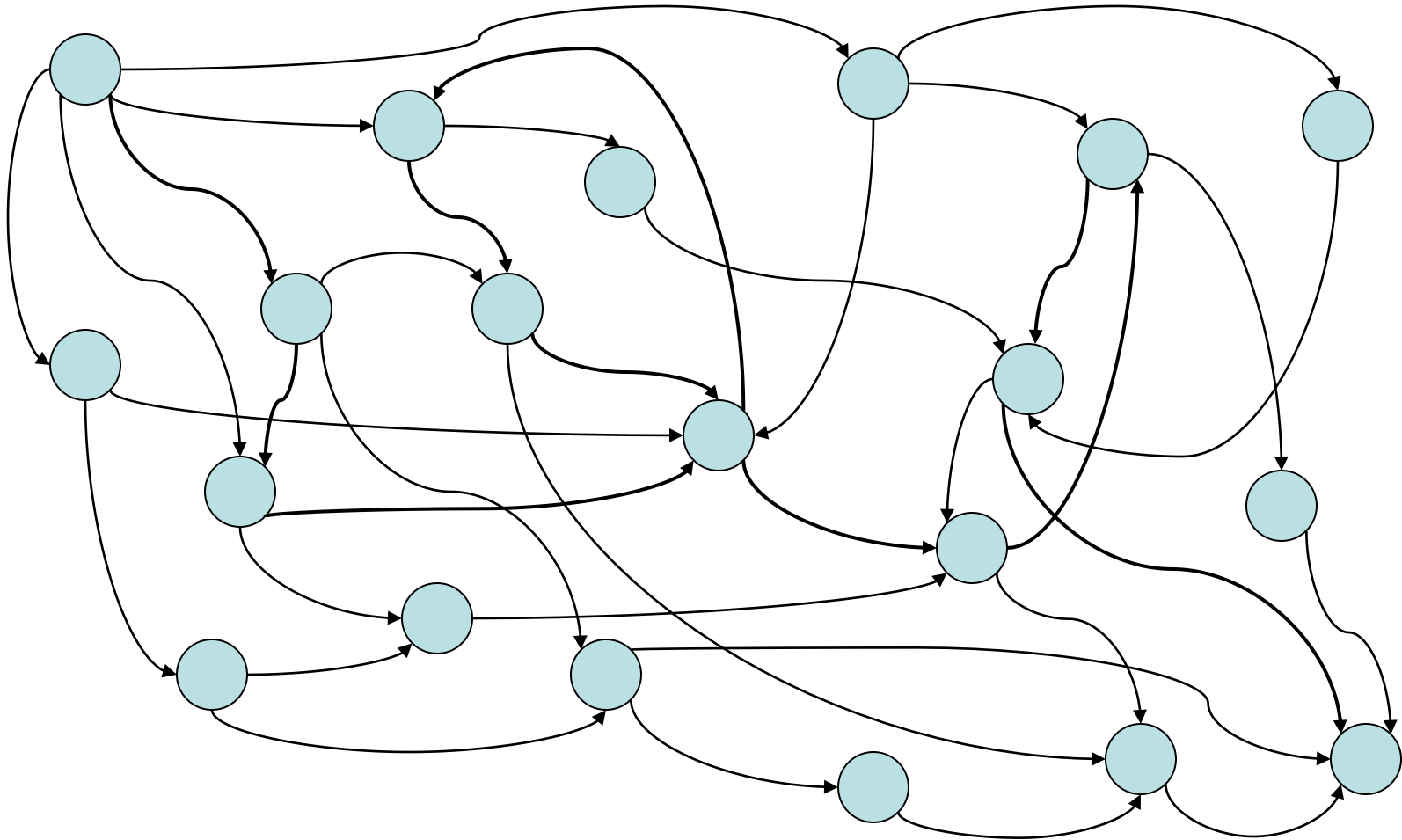
# Conversation Experience

## Meta Memory



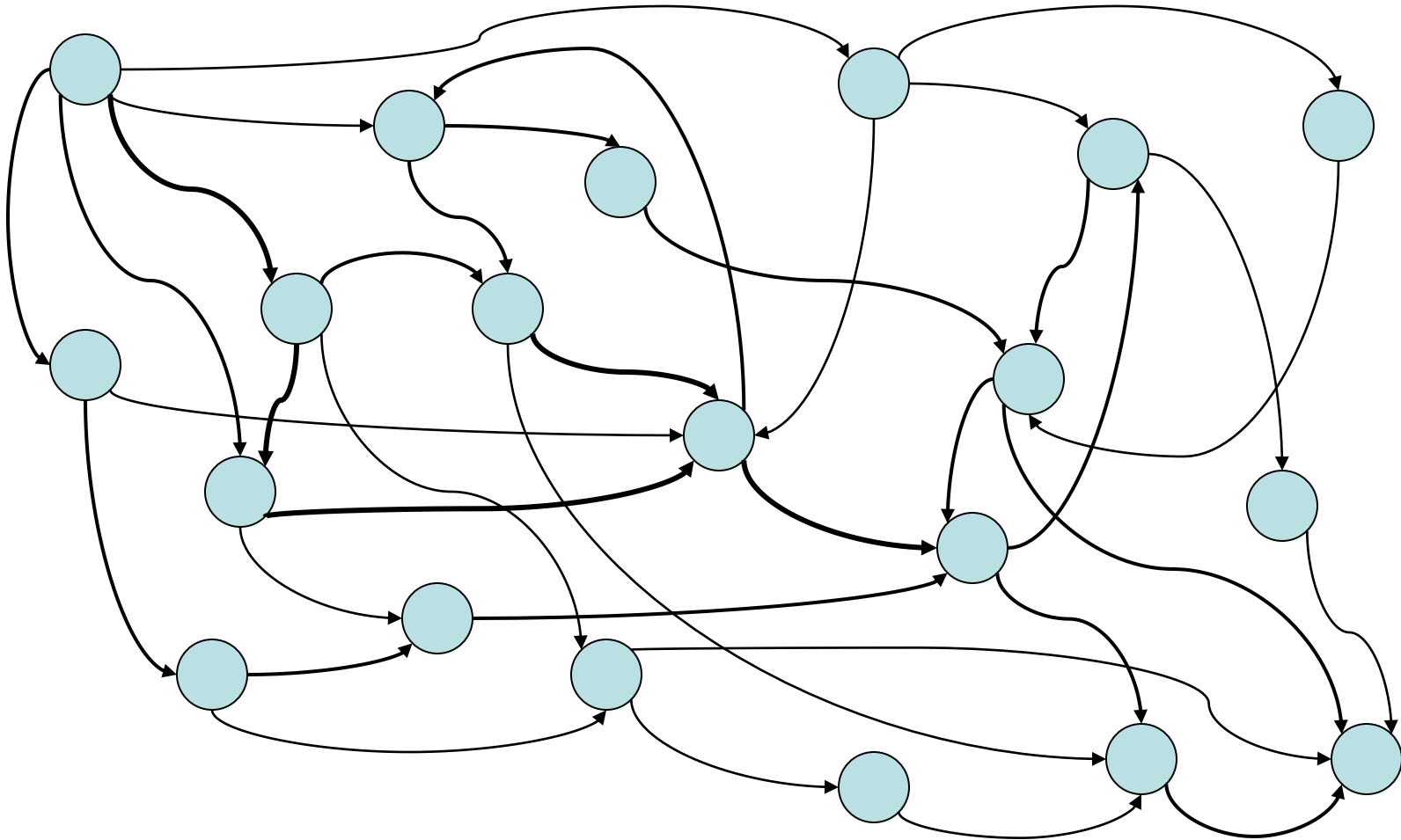
# Conversation Experience

## Meta Memory



# Conversation Experience

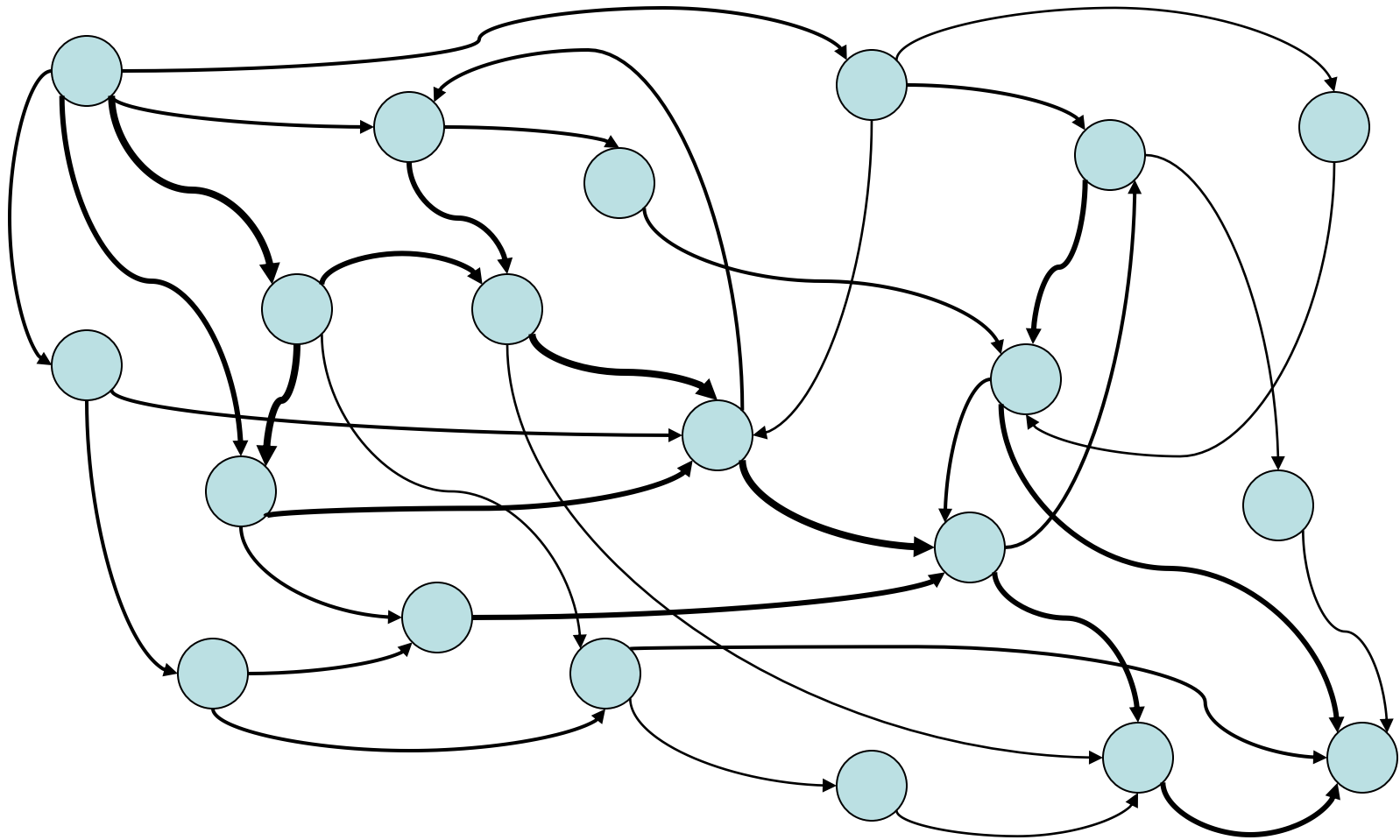
## Meta Memory





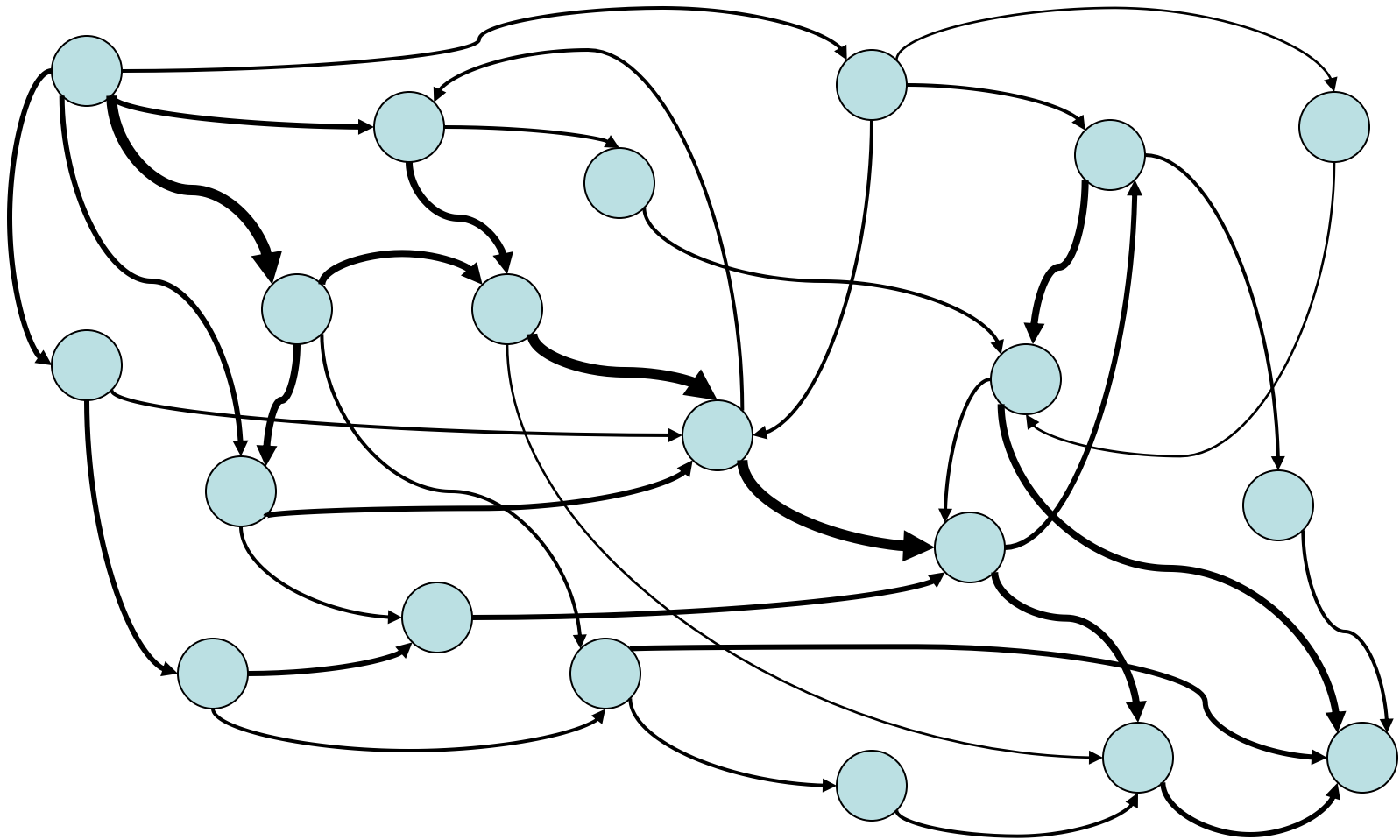
# Conversation Experience

## Meta Memory



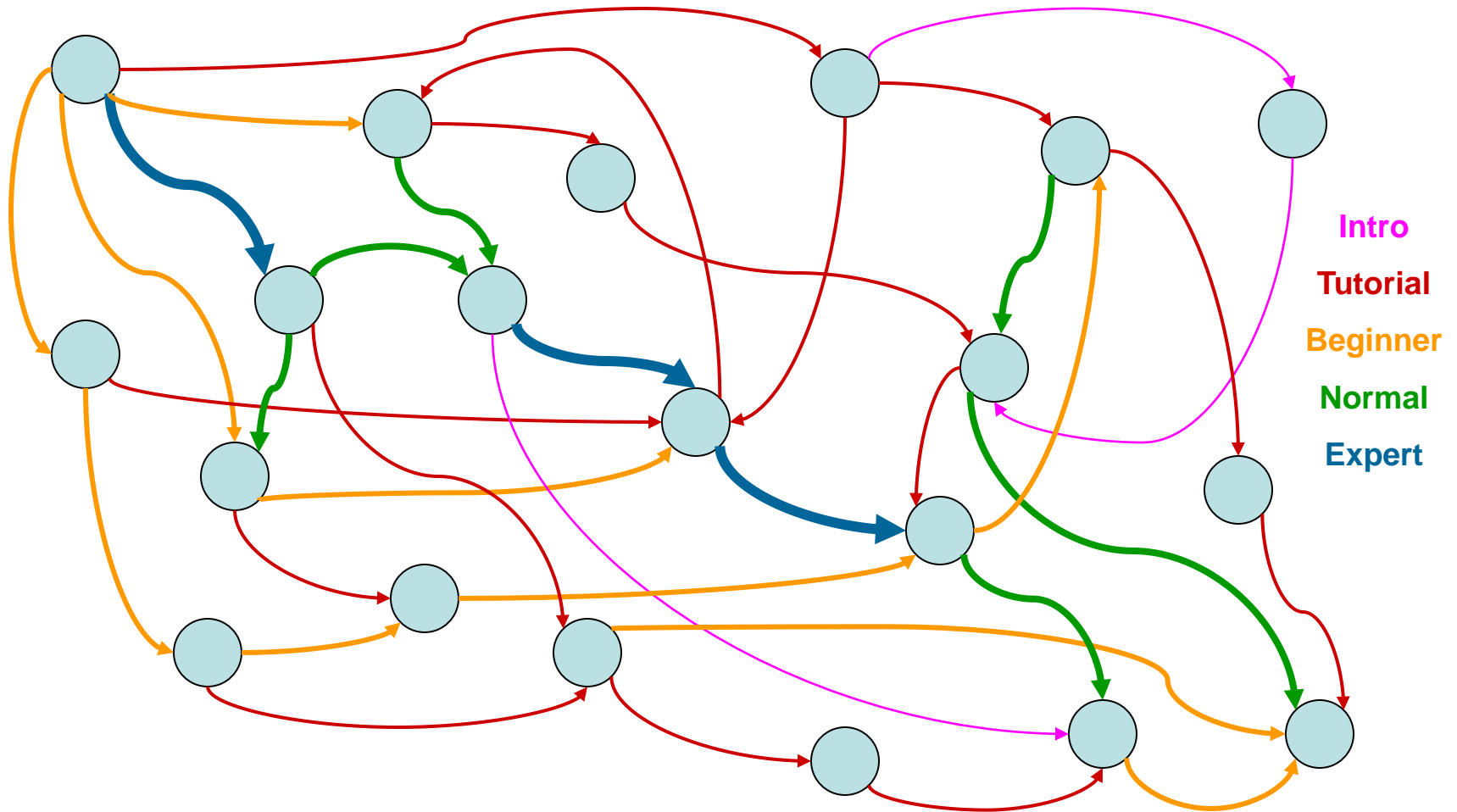
# Conversation Experience

## Meta Memory



# Conversation Experience

## Meta Memory



# High Level Representation For The Previous Video

```

<step>
  <name>CassForPres</name>
  <head>
<?xml version="1.0" encoding="utf-8"?>
    <purpose>Starting point for Cassandra for President</purpose>
    <version>1.00</version>
    <derivedFrom>ejBase.xml</derivedFrom>
    <author>Emmett Coin</author>
    <date>20120215</date>
  </head>
  <body>
    <attention>
      <grammar>ejBase</grammar>
    </attention>
    <response>
      <rule name="whyVoteCass" experiencePool="whyVote" forgetHalfLife="40"
        learnImpulse="0.60">
        <pattern input="{R:needVotes:ejExist}">TRUE</pattern>
        <examplePattern>
          <ex>why should I vote for you</ex>
        </examplePattern>
        <action>
          <presentation>
            <text>{M:ctcResponse.xml#voteForMeBecause:}</text>
            <emotion>{M:ctcGesture.xml#calmHappySkeptic:ejCalm}</emotion>
            <semantic>Why vote for me?</semantic>
          </presentation>
          <displayHTML>
            <target id="information"
              type="tree"><h1>{M:ctcResponse.xml#voteBanner:Vote!}</h1></target>
          </displayHTML>
          </action>
        </rule>
      <rule name="otherCandidates" experiencePool="opponents"
        forgetHalfLife="40" learnImpulse="0.50">
        <pattern input="{R:otherCandidates:ejExist}">TRUE</pattern>
        <examplePattern>
          <ex>tell me about Newt</ex>
        </examplePattern>
        <action>
          <presentation>
            <text>{M:ctcResponse.xml#noTalkAboutOtherCandidates:No
              comment.}</text>
            <emotion>ejSad</emotion>
            <semantic>Comment on Candidates</semantic>
            <gesture>{M:ctcGesture.xml#disbelief:lookleft,d}</gesture>
          </presentation>
        </action>
      </rule>
    </response>
  </body>
</step>

```

```

<rule name="thePres" experiencePool="pres" forgetHalfLife="40"
  learnImpulse="0.50">
  <pattern input="{R:president:ejExist}">TRUE</pattern>
  <examplePattern>
    <ex>Do you have an opinion about Obama</ex>
  </examplePattern>
  <action>
    <presentation>
      <text>{M:ctcResponse.xml#commentOnPresident:No
        comment.}</text>
      <emotion>ejCalm</emotion>
      <semantic>Comment on President</semantic>
      <gesture>winkright,a</gesture>
    </presentation>
  </action>
</rule>
<rule name="readyToRun" experiencePool="run" forgetHalfLife="120"
  learnImpulse="0.90">
  <pattern input="{R:ctcReady:ejExist}">TRUE</pattern>
  <examplePattern>
    <ex>are you ready to go</ex>
  </examplePattern>
  <action>
    <presentation>
      <text>Ready as I ever will be!</text>
      <emotion>ejHappy</emotion>
      <semantic>Ready to run?</semantic>
      <gesture>bigwinkleleft,a</gesture>
    </presentation>
  </action>
</rule>
<rule name="goodbye">
  <pattern>"goodbye"*|*so long*|*bye*</pattern>
  <examplePattern>
    <ex>I gotta go goodbye</ex>
    <ex>so long I'll see you later</ex>
  </examplePattern>
  <action>
    <presentation>
      <text>I guess it's goodbye then. Later.</text>
      <emotion>ejHappy</emotion>
      <semantic>Goodbye</semantic>
    </presentation>
  </action>
</rule>
</response>
</body>
</step>

```



# “Why vote for me?” Rule

```
<rule name="whyVoteCass" experiencePool="whyVote" forgetHalfLife="40"
  learnImpulse="0.60">
  <pattern input="{R:needVotes:ejExist}">TRUE</pattern>
  <examplePattern>
    <ex>why should I vote for you</ex>
  </examplePattern>
  <action>
    <presentation>
      <text>{M:ctcResponse.xml#voteForMeBecause:}</text>
      <emotion>{M:ctcGesture.xml#calmHappySkeptic:ejCalm}</emotion>
      <semantic>Why vote for me?</semantic>
    </presentation>
    <displayHTML>
      <target id="information"
type="tree"><h1>{M:ctcResponse.xml#voteBanner:Vote!}</h1></target>
    </displayHTML>
    </action>
  </rule>
```



# Thank you



Emmett Coin  
ejTalk, Inc  
[emmett@ejTalk.com](mailto:emmett@ejTalk.com)

