Multi-turn Context Sensitive Exchanges:
They change the game

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ejTalk, Inc.
www.ejTalk.com

Emmett Coin
Industrial Poet, CEO

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 “ejTalk” 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 a 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

Cassandra wants to be a ……..

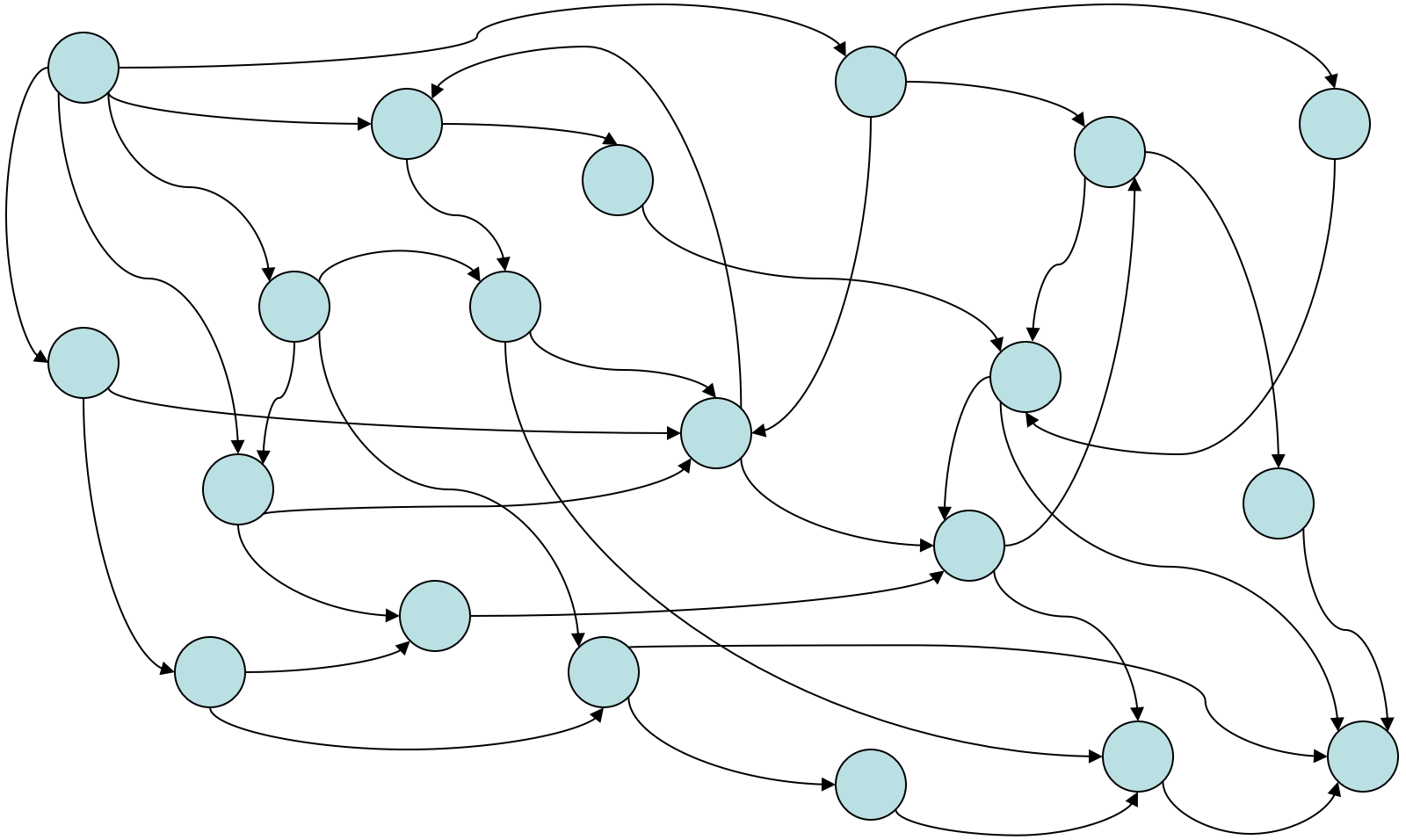
Candidate

- 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?

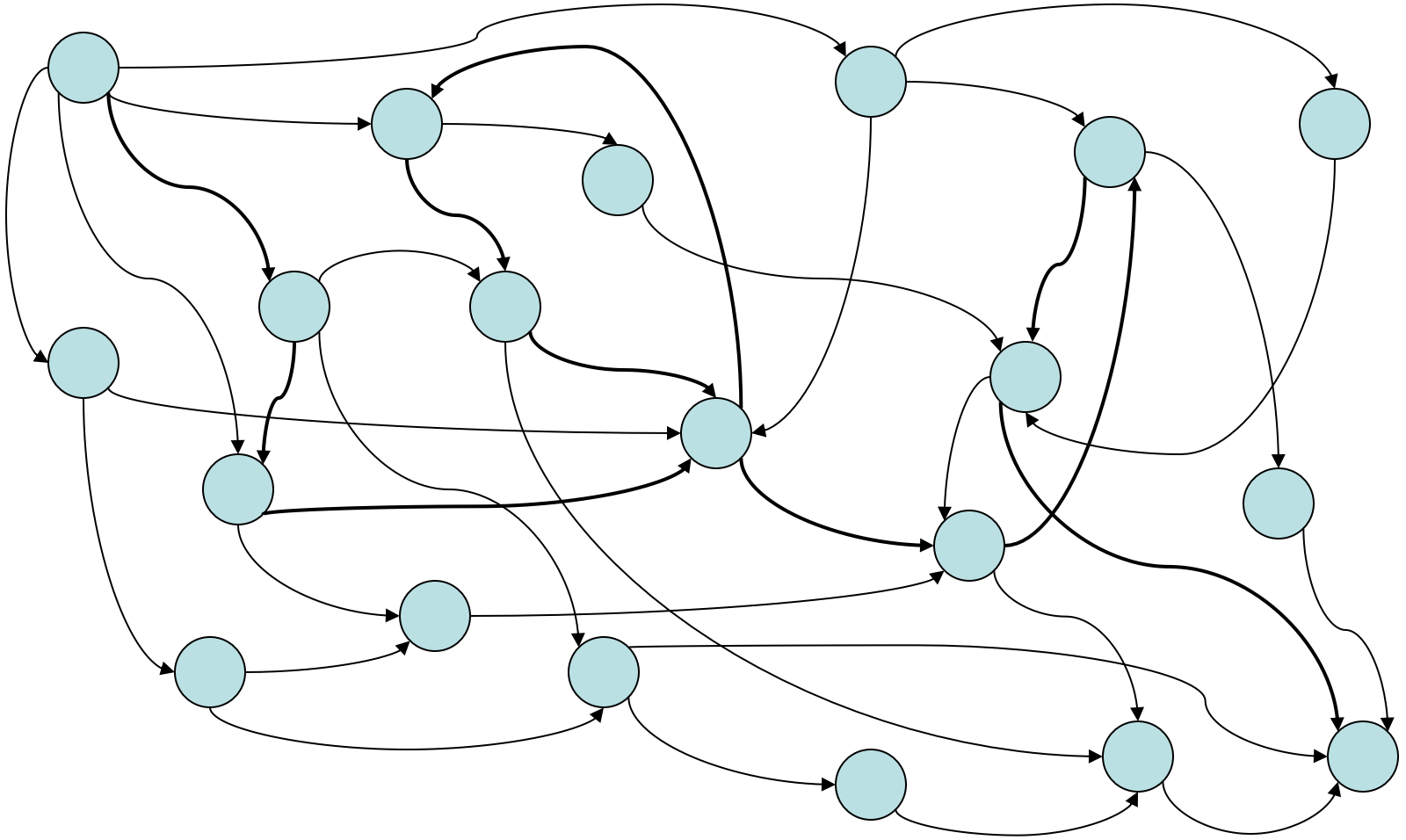
Conversation Experience

Meta Memory



Conversation Experience

Meta Memory



Conversation Experience

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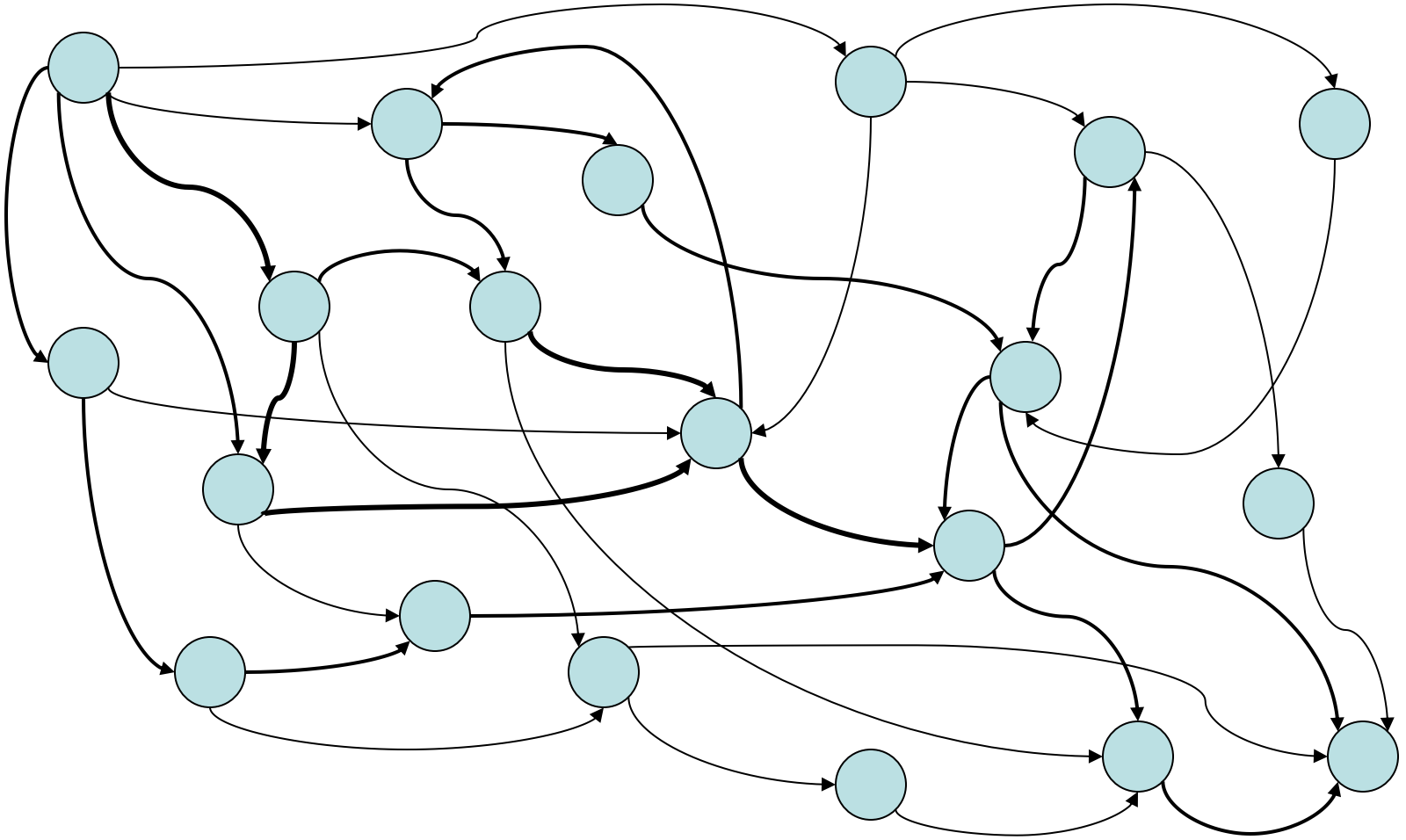

Conversation Experience

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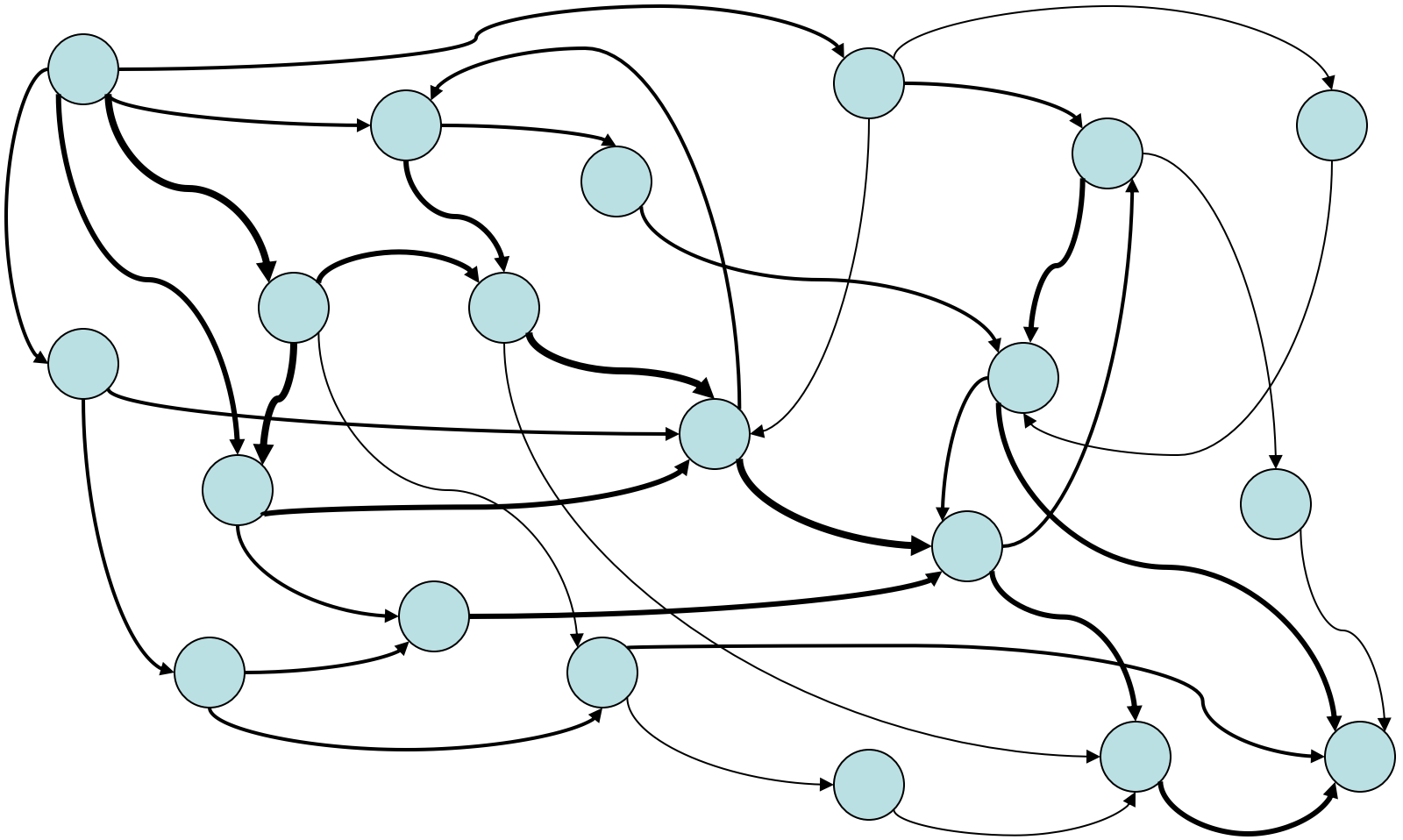

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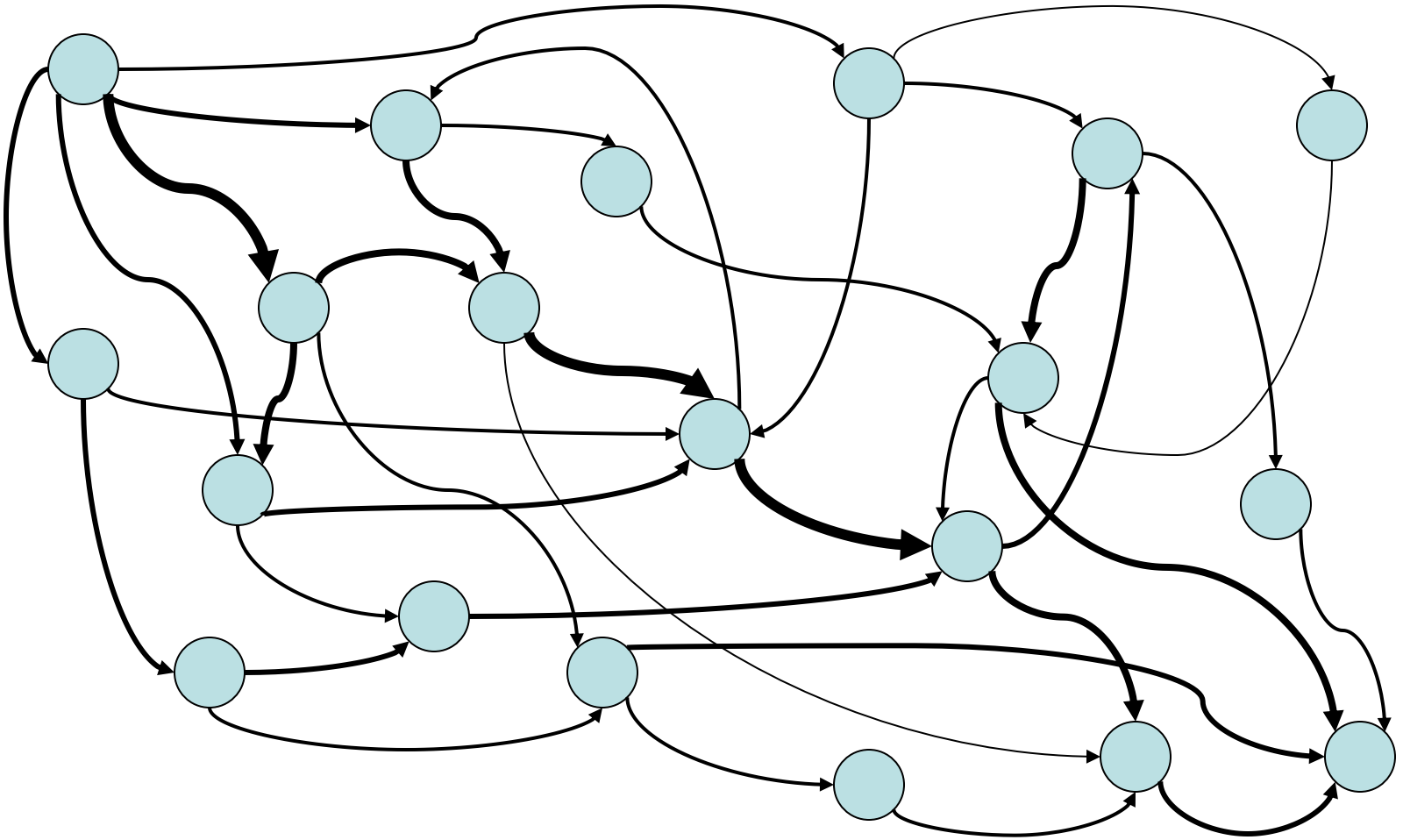

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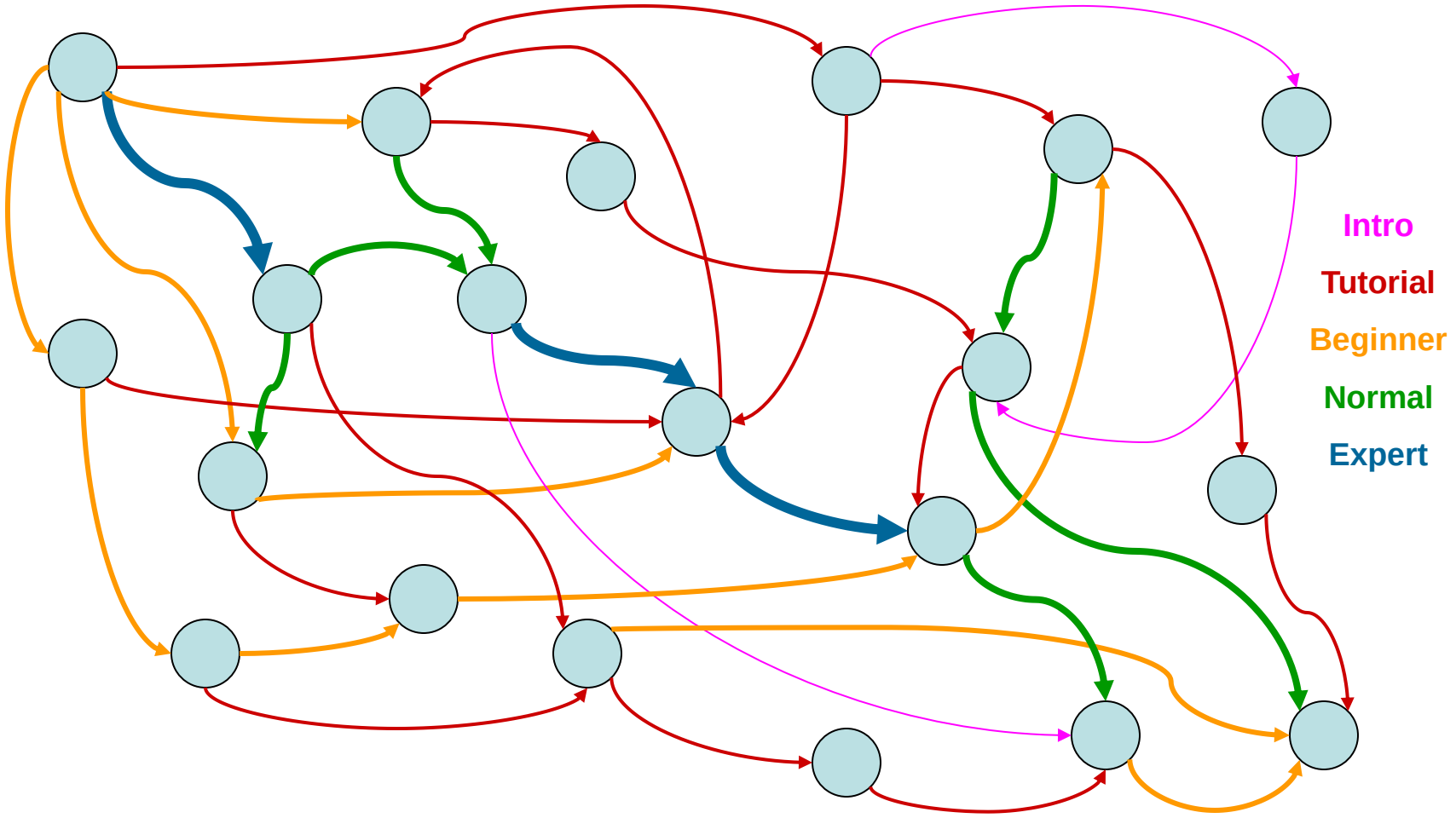

High Level Representation For The Previous Video

```
<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>
<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>bigwinkleft,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

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                    <emotion>{M:ctcGesture.xml#calmHappySkeptic:ejCalm}</emotion>
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                </displayHTML>
            </action>
        </rule>
```

Thank you

Emmett Coin
ejTalk, Inc
emmett@ejTalk.com