ACT-R 6.0 Updates
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ACT-R Usage Data

• ACT-R 6 software downloads
  – 2012: 2470
  – 2013: 3178 (116)

• User queries
  – 83 from 42 people
Software Updates

• Since last workshop
  – r1253-r1395
    svn://actr-server.hpc1.cs.cmu.edu/actr6
• Lots of small changes
• Discuss the few significant ones
CCL Device

- Clayton Stanley & Mike Byrne
- Support for the native Cocoa windows in CCL
- Library that provides the MCL GUI interface
Spreading Activation

• Default activation spread will not go negative
  – S-log(fan) stopped at 0.0
  – Set :nsji parameter to t to restore
Whynot-dm

> (whynot-dm p1 p2 p4)

Retrieval request made at time 0.585:
  ISA COMPREHEND-SENTENCE
  ARG2 PARK

P1
  ISA COMPREHEND-SENTENCE
  RELATION IN
  ARG1 HIPPIE
  ARG2 PARK

Declarative parameters for chunk P1:
  :Activation  0.000
  :Permanent-Noise  0.000
  :Base-Level  0.000
  :Source-Spread  0.000
  :Sjis ((P1 . 1.6) (IN . 0.0) (HIPPIE . 0.0) (PARK . 0.0))
  :Last-Retrieval-Activation  0.214
  :Last-Retrieval-Time  0.585

P1 matched the request
P1 was the chunk chosen to be retrieved

P2
  ISA COMPREHEND-SENTENCE
  RELATION IN
  ARG1 HIPPIE
  ARG2 CHURCH

Declarative parameters for chunk P2:
  :Activation  0.000
  :Permanent-Noise  0.000
  :Base-Level  0.000
  :Source-Spread  0.000
  :Sjis ((P2 . 1.6) (IN . 0.0) (HIPPIE . 0.0) (CHURCH . 0.90685284))

P2 did not match the request

P4
  ISA COMPREHEND-SENTENCE
  RELATION IN
  ARG1 CAPTAIN
  ARG2 PARK

Declarative parameters for chunk P4:
  :Activation  0.000
  :Permanent-Noise  0.000
  :Base-Level  0.000
  :Source-Spread  0.000
  :Sjis ((P4 . 1.6) (IN . 0.0) (CAPTAIN . 0.5013877) (PARK . 0.0))
  :Last-Retrieval-Activation  0.107
  :Last-Retrieval-Time  0.585

P4 matched the request
P4 did not have the highest activation

(P7 P4 P1)
Extending with modification requests

\[ (p^* \text{ extend} \]
\[ \quad \ldots \]
\[ \quad ==> \]
\[ \quad +\text{goal}\]
\[ \quad =\text{slot} =\text{value} \]
\[ \quad +\text{imaginal}\]
\[ \quad =\text{slot} =\text{value} \]

0.050 \hspace{1em} \text{PROCEDURAL} \hspace{0.5em} \text{PRODUCTION-FIRED EXTEND} \hspace{1em} \#| \text{Warning: schedule-mod-buffer-chunk called with an invalid modification (NEW T)} |\# \\
0.050 \hspace{1.1em} \text{GOAL} \hspace{1.2em} \text{EXTENDING-CHUNK-TYPE GOAL} \\
0.050 \hspace{1.1em} \text{GOAL} \hspace{1.2em} \text{MOD-BUFFER-CHUNK GOAL} \\
0.250 \hspace{1.1em} \text{IMAGINAL} \hspace{1.2em} \text{EXTENDING-CHUNK-TYPE CHUNK} \\
0.250 \hspace{1.1em} \text{IMAGINAL} \hspace{1.2em} \text{MOD-BUFFER-CHUNK IMAGINAL} \]
Request parameters in direct requests

(p ex1
  ==> 
  +retrieval> (chunk :recently-retrieved nil)
)

(p ex2
  =retrieval> isa visual-location 
  ==> 
  +visual-location> (=retrieval :attended t))
More flexible ‘clean’ !eval!

- Imaginal-action requests allow a list of slot names

+imaginal-action>
isa simple-action
action <action>
slots <slots list>

(apply <action> <slots list>)
Chunk-type hierarchy flexibility

(chunk-type parent)
(chunk-type (child (:include parent)) slot)

(p using-child-slots
 =goal>
   isa parent
   slot =x
   =>
 =goal>
   slot nil
+retrieval>
   isa parent
   slot nil)
New Chunk(-type) extension

• Just extend the chunk not the type
  – Declare the type static
    (chunk-type (<type> (:static t)) ...)
• Creates implicit types based on the slots
  – A graph of subtypes
A slot value of nil in a static chunk

- Consider a value of nil as not having the slot instead of there being a slot with a value nil
- Allow removal of extended slots
- Pattern matching for "<slot> nil" is true if the chunk doesn’t have the slot
Questions and the Future

• What are chunk-types?
  – Should chunk-types just go away?

• What does nil really mean?

• How much would really change if all chunks became static?

• Is that a hint of an ACT-R 7.0?