Today in a Nutshell

- ACT-R 5.0? Cool.
- Christian Le(t-go-of-my-)biere
  - dem buffers is where it’s at
- Mike the Hand-Eye Guy
  - take this buffer and stuff it
- Dan the Man
  - hey, you gotta problem with the environment??
Perceptions and Ramblings

• Unification across architecture components!!
• Parameter simplification!!
• Potential to better model real-world tasks
• Hmmm...
  - is ACT-R a theory or a tool?
  - cumulative progress vs. scientific revolution?
  - why ACT-R? why a cognitive architecture?
• Interesting...
  - PGSS *started* with ACT-R/PM!
For the next issues of Glamour & GQ…

<table>
<thead>
<tr>
<th>What’s Hot</th>
<th>What’s Not</th>
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<tbody>
<tr>
<td>buffers</td>
<td>stacks</td>
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<tr>
<td>buffer stuffing</td>
<td>production stuffing</td>
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<tr>
<td>embodiment</td>
<td>“time now”</td>
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<tr>
<td>syntax</td>
<td>sin-tax</td>
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<td>lightweight tools</td>
<td>Interbook</td>
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<td>environment</td>
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<tr>
<td>act.psy.cmu.edu</td>
<td><a href="http://www.vanilla-ice.com">www.vanilla-ice.com</a></td>
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ACT-R 5.0 in the Real World

- Seems well-suited (potentially) to handle real-world tasks
- Work in progress to 6.0
- A few points of discussion...
Perception

- **Visual-location vs. visual-object**
  - two spotlights of attention??
    - start state
    - !find-location!
    - !move-attention!
    - **buffer stuffing**
      - object appears
      - buffer “stuffed”
      - then what?

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Perception

Combined visual object

<table>
<thead>
<tr>
<th>visual-location</th>
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<tr>
<td>screen-x</td>
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<td>screen-y</td>
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<thead>
<tr>
<th>visual-object</th>
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<tr>
<td>screen-pos</td>
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<td>value</td>
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Perception

- Saliency map $\rightarrow$ what to attend, stuff, etc.
  - generalize to images, etc.
Multitasking

Q: How can ACT-R perform multiple tasks?

A/Q: What do other modules imply?
- retrieval: set criteria, order by match score
- goal: set criteria, order by priority
A Generalized View

- Top-down processes dictate criteria (if any)
- Bottom-up processes act on criteria (if any)
  - idle-time buffer stuffing for retrieval?? goal??

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<tr>
<td>retrieval</td>
<td>match score</td>
<td>variables</td>
</tr>
<tr>
<td>goal</td>
<td>priority</td>
<td>recency, etc.</td>
</tr>
<tr>
<td>visual-object</td>
<td>saliency</td>
<td>left/right, etc.</td>
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buffer ➔ pool
Embodiment

Perception

- Signals (e.g., video, sound)
  - Lower-level objects (e.g., lines/letters)
    - Higher-level objects (e.g., words)
      - ACT-R
        - Higher-level actions (e.g., say “hi”)
          - Lower-level actions (e.g., fixation location)
            - Signals (e.g., movement, speech)

Action
Individual Differences

- Real-world industry cares about individuals’ (’ money)

- Sample differences:
  - age (young vs. old)
  - strategies (wander vs. ask)
  - personalities (passive vs. aggressive)
  - physical state (sleepy, drunk)

- Hardware & software differences !!
Education / Environment

- Who is the user base?
  - psychologists? programmers? engineers?

- Programming language
  - to most, LISP is dead
  - alternate versions? (non-ACT-R syntax?)

- Environment is too heavyweight

- Why write a cognitive model at all???

- Selling ACT-R is difficult and brand-name-ish; selling cognitive architectures works!