

Interacting with ACT-R: Waaay Way Past, Past, Present, and the Future!?

Frank J. Lee
Computer Science
Drexel University



What is my role here among my distinguished colleagues?

- Mike Byrne: Creator of ACT-R/PM
- Christian Lebiere: 1/2 of ACT-R Theory
- Kevin Gluck: Might hand of the USAF
- Mike Scholles: Super Lisp Hacker
- Dan Bothell: Do I really need to say anything more
- Salvucci: Creator of EMMA and the powerpoint picture and demo of DRIVER that we all like to “reuse”
- Ritter: Soar, ACT-R, ACT-R Faq, basically a renaissance man

So where do I fit in?

- Frank Lee: I’m the Ralph Nader of the ACT-R/PM, I’m here for YOU!

In the beginning, there was ~~darkness...~~

Lisp Call

;; From ACT-R 4.0 Waterjug Tutorial...

(P move-ab

=goal>

ISA solve

a =ac

b =bc

c =cc

past =lis

!eval! (> =ac 0)

!eval! (< =bc 5)

==>

=goal>

a (!eval! (from-jug =ac =bc 5))

b (!eval! (to-jug =ac =bc 5))

=goal>

past (!eval! (cons (list =ac =bc =cc) =lis))

!eval! (report)

)

(defun from-jug (sc dc dm)

(let ((move (min sc (- dm dc))))

(- sc move)))

+ Plus

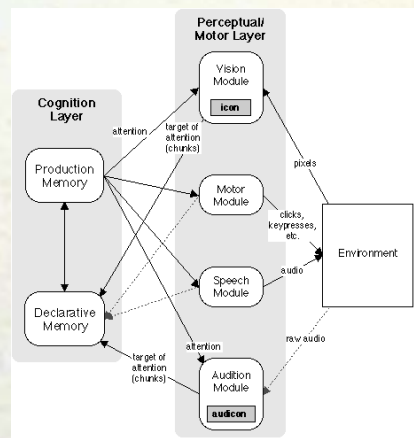
- No external hook up!
- Worked great, and if it didn't simply redefine your I/O lisp function!
- Didn't have to deal with the messy questions like "Where is my finger?"

- Minus

- "Questionable" constraints on model perception and action.

Let there be light!

And then there was ACT-R/PM v1.0 β 3.141



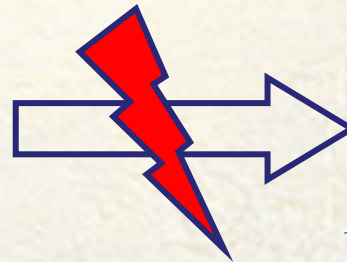
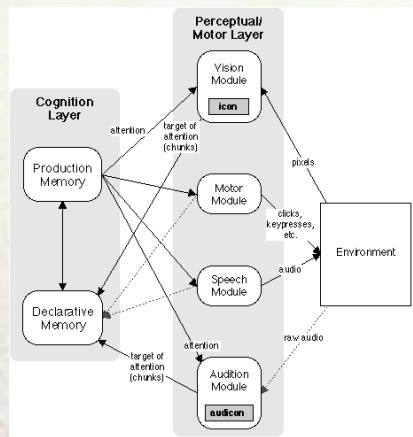
N	Z	M	S
F	G	J	X
W	Y	D	R

1. A hippie is in the park.
2. A hippie is in the church.
3. A hippie is in the bank.
4. A captain is in the park.
5. A captain is in the church.
6. A debutante is in the bank.



- ACT-R now finally had an eye and hands. This was an EPIC moment in ACT-R history!
- ACT-R/PM was applied to number of standard cognitive psychology experiments, and the future looked bright!

And then there was the KA-ATC TASK!



How do I look at nothing??
How do I make something again??
How do I look at something faster??

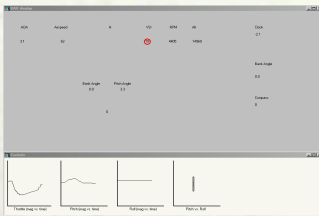
Runway	TYPE	FUEL	POS.	Score
342	DC10	5	3	380
148	727	4	3	350
693	727	3	e	20
428	prop	* 3	2	DRY
-> 259	727	4	1	0 - 20 knots from SOUTH
840	prop	4	1	
190	DC10	5	1	

Plts in Queue:	
<F1>	to accept

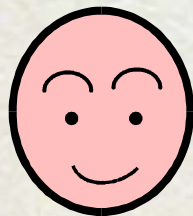
Winds from South	
n	#1
n	#2
n	#3
w	#4

- ACT-R/PM was given the KA-ATC task a more complex and dynamic task that it was used to dealing with.
- Some of ACT-R/PM's growing pains and resolutions were outlined in Lee and Byrne (1999) ACT-R Workshop presentation at GMU.

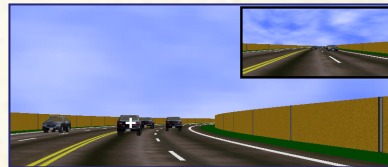
With the awkward years came happy growth spurts!



Gluck's UAV



*Gray's
Argus Prime*

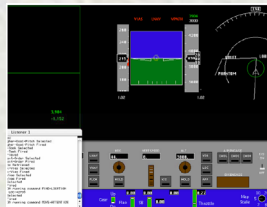


Salvucci's DRIVER

ACT/RPM 1.0

+

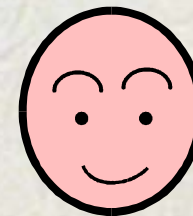
ACT-R 5.0



Bryne's X-Plane



*Ritter's
Minesweeper*



Anderson's GTASP

Among Others!!

Looking towards the future and beyond!



- Über dynamic environment
- Real-time
- Perceiving, Representing, and Processing 3D Space
- Perceiving, Representing, and Processing Time
- Multitasking
- Prospective Memory
- Skill Acquisition
 - Production Compilation
 - Strategy Learning
- Working with and against a mixed team of human and simulated agents

A peek into the future: The COGBOT Project

