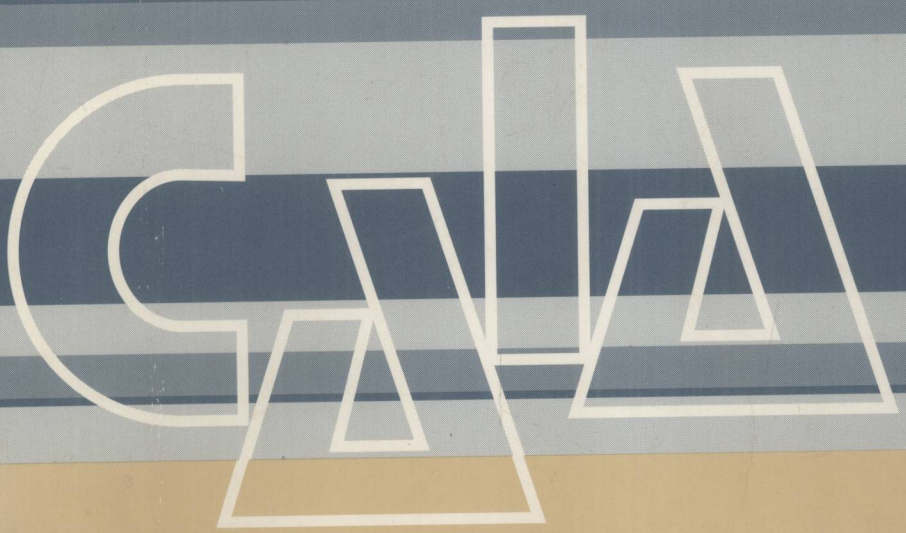
Volume II: Visuals

Proceedings
The Seventh Conference on Artificial Intelligence Applications

Sponsored by the IEEE Computer Society
Miami Beach, Florida February 24–28, 1991



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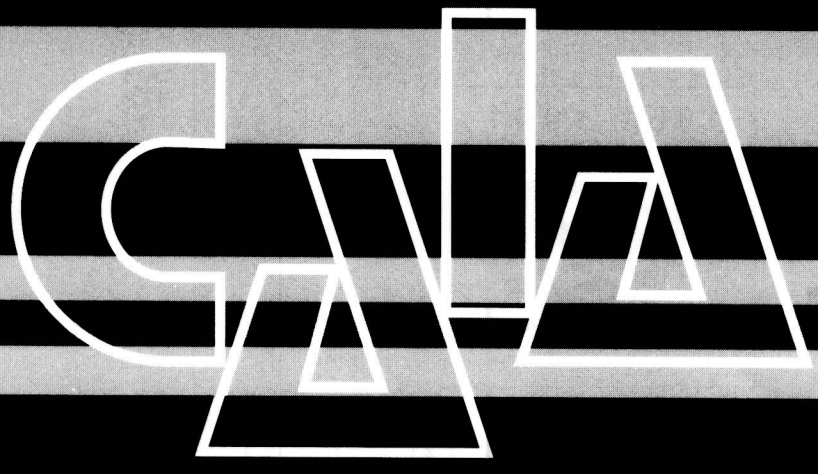

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SEVENTH IEEE CONFERENCE ON ARTIFICIAL INTELLIGENCE APPLICATIONS

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PANEL SESSIONS

PRESENTATIONS

PANEL SESSIONS

CHAIRMAN'S WELCOME

Se June Hong
IBM T. J. Watson Research Center

Over 250 papers submitted:

1/7 → short papers
1/7 → long papers

Thanks to:

Program Committee	- Tim Finin
Tutorial	- Dan O'Leary
Publicity	- Jeff Pepper
Local arrangement	- Alex Pelin
	- Mansur Kabuka
IEEE-Computer Soc.	- Nancy Wise
Steering Committee	- Mark Fox
Best Student Paper Award	- IBM

SJ0220
02/20/91

Best Student Paper Award

"Multi-Sensor Image Interpretation Using Laser Radar and Thermal Images"

Chen-Chau Chu and J. K. Aggarwal
Computer and Vision Research Center
The University of Texas at Austin

Honorable Mention

"An Intelligent Assistant for Financial Hedging"

Michel Benaroch and Vasant Dhar
Information Systems Department
New York University

AND

"A Multi-level Pattern Matching Method for Text Image Parsing"

Michal Prussuk and Jonathan J. Hull
Department of Computer Science
State University of New York at Buffalo

SH0220-5

What will you do with

1000 mips

200 Mb main memory

10 Gb disc

Remote Communication at today's disc access rate

on your desk ?

- ☑ n to (n + few) in exponential processes
- ☑ Play hyper–Mario
- ☑ Utility information/transaction services
- ☑ Significantly more user interface services
- ☑ Connection to Huge Data/Knowledge/Program Base

SH1105 11/06/90

CH2967-8/91/0000/0003$01.00 © 1991 IEEE

"Knowledge is Power"

- Expert Systems, Knowledge Based Systems
- Inclination shells, Knowledge Primed Shells
- Knowledge Substrates, Common Sense KB
- Intelligent User Interfaces

SH0220-3
02/20/91

Challenges

☑ Characterize AI Algorithms
- Complexity, Does it scale up?
- When is it effective?
- How do we detect when it is effective?

☐ Characterize Tasks of Applications
- What kind of Search?
- What kind of Planning?
- What kind of Classification?
- What kind of Designing?
- Etc.

☑ Sensible Knowledge Representation
- To support large, complex application
- To be shared and re-used

☑ Do these with rigor
- Prove theoretically
- Prove in a real system

SH0220-4
02/20/91

Towards Intelligent Systems in the DoD

Lt Col Stephen E. Cross, USAF
DARPA/ISTO

OVERVIEW

- 21st Century Challenges
- A Crucial Role for Intelligent Systems
- Some Visionary Potential Applications
- Assessment of AI Technology
- DARPA's Emphasis on Intelligent Systems Engineering
- Finally! – Concluding Remarks

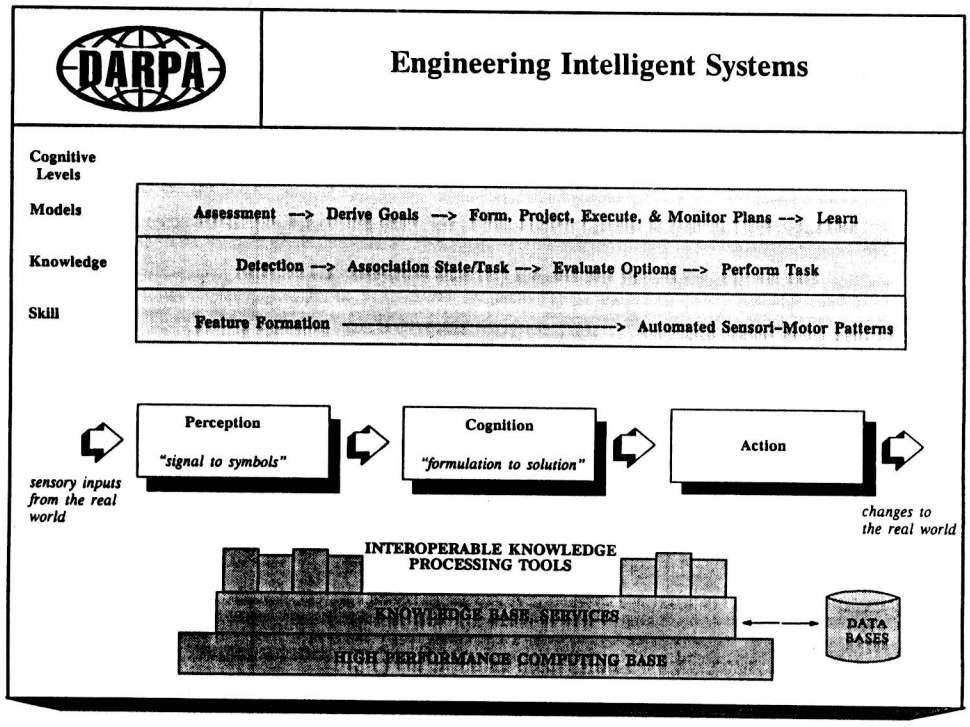
21st Century Challenges

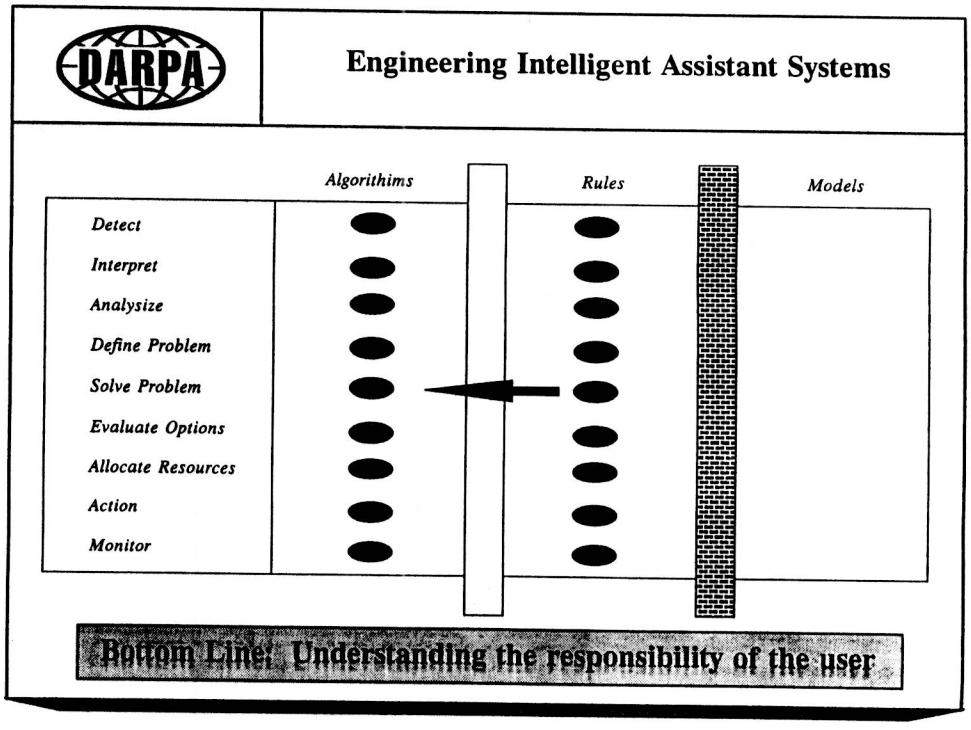
- First, What is the Department of Defense?
- What Factors Shape Military Strategy?
- What are the Implications?
- What is the Role for Technology?

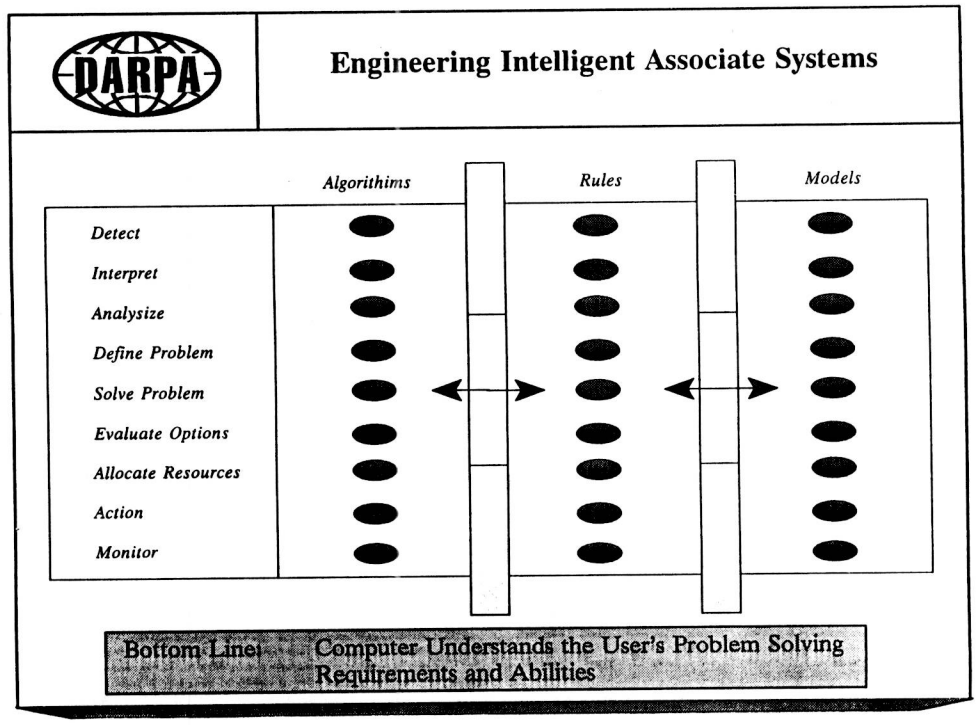
Implication: Greater role for intelligent systems

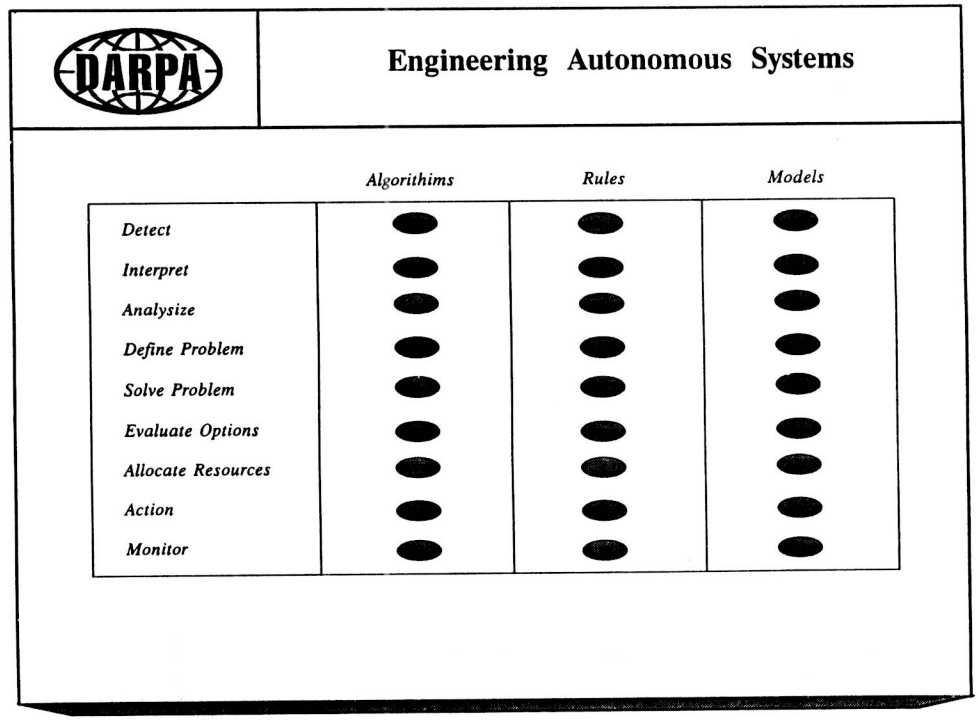
A Crucial Role for Intelligent Systems

- First, what are they?
- How do they differ from expert systems?
- What are the critical system needs?


DARPA
Engineering Intelligent Systems
Cognitive Levels
Models
Knowledge
Skill
Assessment --> Derive Goals --> Form, Project, Execute, & Monitor Plans --> Learn
Detection --> Association State/Task --> Evaluate Options --> Perform Task
Feature Formation --> Automated Sensori-Motor Patterns
Perception
"signal to symbols"
Cognition
"formulation to solution"
Action
sensory inputs from the real world
changes to the real world
INTEROPERABLE KNOWLEDGE PROCESSING TOOLS
KNOWLEDGE BASE, SERVICES
HIGH PERFORMANCE COMPUTING BASE
DATA BASES


DARPA
Engineering Intelligent Assistant Systems
Algorithims
Rules
Models
Detect
Interpret
Analysize
Define Problem
Solve Problem
Evaluate Options
Allocate Resources
Action
Monitor
Bottom Line: Understanding the responsibility of the user


DARPA
Engineering Intelligent Associate Systems
Algorithims
Rules
Models
Detect
Interpret
Analysize
Define Problem
Solve Problem
Evaluate Options
Allocate Resources
Action
Monitor
Bottom Line: Computer Understands the User's Problem Solving Requirements and Abilities


DARPA
Engineering Autonomous Systems
Algorithims
Rules
Models
Detect
Interpret
Analysize
Define Problem
Solve Problem
Evaluate Options
Allocate Resources
Action
Monitor

Critical System Needs

- Ability for user tailoring or modification
- Adaptive, experience–based modification
- Cooperative distributed problem solving
- Real time (i.e., just in time) performance
- Intelligent, interactive documentation
- Integration into conventional software environments
- Effective VV&T/quality assurance methods

Some Visionary Potential Applications

- **Crisis Action Planning Systems**
  - *Dynamic Analysis and Replanning Tool*
- **Advanced Simulation and Training**
  - *Magic Carpet*
- **Manufacturing and Design Engineering**
  - *Engineer's Associate*
- **Autonomous Systems**
  - *Unmanned Vehicles*