



American Association for Artificial Intelligence
445 Burgess Drive
Menlo Park, CA 94025
(650) 328-3123
www.aaai.org

PRESS BRIEFING

National Conference on Artificial Intelligence (AAAI-05)
Pittsburgh, PA
Westin Convention Center
July 9-13, 2005

No single snapshot can encompass the broad field of Artificial Intelligence. However, a montage of shots can encapsulate some of the latest advances and emerging trends as presented at this year's National Conference on AI (www.aaai.org/Conferences/National/2005/aaai05.htm)

The purpose of this briefing is to assist the members of the press in navigating through the multi-faceted content of the conference and identify potential story opportunities. It offers a bird's-eye-overview of the conference, including:

- 2005 Awards for Innovative Applications of AI Page 2
- Emerging Innovative Applications of AI 4
- Invited Speakers 5
- Robot Competition & Exhibition 6
- First Annual General Game Playing Competition 7
- Intelligent Systems Demonstrations 8
- Technical Conference 9

For further information, a press pass, or assistance in setting up interviews, please contact:

Sara Hedberg
AAAI Media Liaison
sara@hedberg.com
(425) 643-5310
(425) 444-7272 (cell phone – and July 10-13)

2005 Awards for Innovative Applications of AI

The following 7 applications will receive the prestigious AAAI Award for Innovative Applications of AI at the conference. These applications illustrate the continued strategic role AI is playing in new computer systems across a broad range of applications and industries; and delivering tremendous returns on investment.

This year's award winners show that recently-deployed, cutting edge AI applications can be found around the world in industries as disparate as finance, transportation and aerospace; they can be found running operations under the ground, on the ground, in the ocean, in the air, and into space; and they can be found assisting engineers, insurance underwriters, F-18 pilots and genomic research scientists.

These winners join a stellar group of 16 years of award winners. (For award winners from 2003 and 2004, see the IAAI Conference Backgrounders at <http://aaai.org/Pressroom/Backgrounders/backgrounders.html>.)

This year's awards go to:

- **General Electric Company / Genworth Financial**
Automating the underwriting of insurance applications
Those watching this year's Wimbledon Tennis Championships on TV have likely been entertained by the Genworth advertisements featuring Andre Agassi with his wife Steffi Graff and their wunderkind son. Look under the covers of this \$98 billion company with annual sales of \$11 billion, and you will find an innovative AI-based underwriting system that is giving this insurance giant a competitive advantage.
The automated underwriting system processes 3,500 applications per week for Long Term Care insurance, with near 100% accuracy. This has improved decision consistency, significantly reduced the number of incorrect decisions, and saved an estimated \$500,000 annually in phone interviews previously required for additional information. In May of 2004, Genworth Financial was spun off from the General Electric Company. At the time of the IPO, stock analysts specifically cited this advanced technology as one of the key advantages GNW has over its competitors.
- **ConfigWorks, University Klagenfurt and Bausparkasse Wustenrot (Austria)**
Knowledge-based interactive sales tool for financial services
This software assists sales representatives in determining personalized financial service portfolios for their customers. Commercially introduced in 2003, FSAdvisor is licensed to a number of major financial service providers in Austria. The tool is generalizable to non-financial areas and has been implemented as an advisor for customers shopping online for digital cameras.
- **MTR Corporation for the Hong Kong subway system**
Automatic planning and scheduling of maintenance and repair work
The Hong Kong MTR metro system carries 2.4 million passengers each weekday, compared with New York's subway system which carries roughly one-tenth that number daily. Despite the volume of traffic, the Hong Kong subway was punctual more than 99% of the time in 2004. Each night the system is shut down at midnight for only 4 to 5 hours, during which time all necessary maintenance and repair work is performed. The AI based system streamlines scheduling this work -- maximizing the number of jobs done while ensuring operational safety and resource availability.
- **DCS Corporation for the U.S. Navy and Marine Corps**
Planning software to load, store and release weapons for the F-18 aircraft
This planning software can create legal and safe plans for loading weapons, determine flight restrictions, create safe weapon release sequences and determine weapons delivery restrictions throughout the entire flight scenario for F-18 aircraft. The new AI-based system replaces a legacy software system that was cumbersome,

slower and hard to change. This system has been in use by the Super Hornet community (pilots, etc.) for approximately 2.5 years.

- **NOAA (National Oceanic and Atmospheric Administration) and Northrop Grumman**
Decision support system for monitoring U.S. maritime environment
In support of NOAA's mission goal of ensuring safe, efficient and environmentally sound maritime commerce, this AI-based application helps NOAA personnel monitor, process and disseminate maritime sensors-based information. This is especially important as 98% of all cargo entering the U.S. passes through our Nation's ports and harbors. Nearly half of this cargo is classified as hazardous.
- **NASA – Kennedy Space Center and University of Central Florida**
Autonomous monitoring of the Space Shuttle's telemetry stream during ground operations
This system aids engineers with monitoring the data stream from the Space Shuttle and its ground equipment including environmental controls and hardware that loads propellant. It currently monitors some 50,000 temperatures, pressures, flow rates, liquid levels, turbine speeds, voltages, currents, valve positions, switch positions, and many other parameters that must be controlled and monitored. The system handles an incoming data stream that averages 1,800 changes per second, and 18,000 changes per second peak at launch. The system has been used for over half a year, with more and more Shuttle engineers relying on the system each month. The system was interfaced to and integrated with a legacy launch system. It is now being adapted to monitor shuttle real-time launch countdown activities.
- **Texas A&M University**
Automated crystallographic protein structure determination
This software application uses a variety of AI techniques to automate the process of determining the 3D structure of proteins by x-ray crystallography. It is being used by crystallographers around the world – both in industry and academia, saving up to weeks of effort to determine the structure of just one protein. Such techniques are critical to the structural genomics initiative, a worldwide effort to determine the 3D structure of all proteins in a high-throughput mode, thereby keeping up with the rapid growth of genomic sequence databases.

Emerging Innovative Applications of AI

In addition to the award-winning applications that are fully deployed, the Innovative Applications of AI (IAAI-05) conference recognizes emerging applications that are using AI techniques in ways that demonstrate significant promise. While still experimental, this year's eleven recognized emerging applications point the way to a number of trends:

Intelligent Web Services

- Auto-categorization of Web-based pictures of people (Google and Carnegie Mellon University)

Anti-terrorism / Emergency Response

- Simulator for teaching police force allocation in urban environments (University of Fortaleza, Brazil)
- Training Tool to coordinate various disaster/emergency response entities (e.g., fire engines, police cars, etc.) (University of Southern California, Carnegie Mellon University)

Health Care

- Autonomous long-term patient health monitoring using a network of lightweight sensors (Childrens Hospital Los Angeles/University of Southern California)
- Recognize user activity (e.g., falls, shock, etc.) from sensors (Rutgers University)

Computer Science

- Network security – risk assessment and monitoring (Cycorp)
- Autonomic self-reconfiguring computer systems (IBM India, IBM Zurich)
- AI for adaptive games (Lehigh University; Maastricht University, The Netherlands; Naval Research Laboratory)

Intelligent Environments

- Automatic learning system to automate the intelligent environment (University of Texas at Arlington)

Electric Power Industry

- Multiobjective Optimization of Power Distribution System Operations (Boreas Group, Maverick Technologies America)

Aerospace

- Deep Space Network Scheduling (Jet Propulsion Laboratory, Caltech)

Invited Speakers

This year's invited speakers highlight several areas where AI is playing a prominent role. These internationally recognized experts are very highly regarded in the AI research community. See <http://www.aaai.org/Conferences/National/2005/speakers05.html> for details about their talks and a brief bio. Some of the invited speakers include:

The State of AI

- * Marvin Minsky -- The keynote speaker is the colorful and provocative *Marvin Minsky*, cofounder of the MIT AI Laboratory and one of the founding fathers of AI.
- * Ronald J. Brachman – AAAI Presidential Address
“(AA)AI: More than the Sum of its Parts”

Intelligent Web services

- * James Hendler – IAAI-05 Robert S. Engelmore Memorial Lecture
“Knowledge as Power: A View from the Semantic Web”
- * Jay M. Tenenbaum
“AI Meets Web 2.0: Building the Web of Tomorrow Today”

Science / Computer Science

- * Jeff Hawkins
“From AI Winter to AI Spring: Can a New Theory of Neocortex Lead to Truly Intelligent Machines?”
- * Martin Keane
“Real World Applications of Genetic Programming: Circuits, Optics, Dynamic System Control”

AAAI-05 Invited Speakers

- * Tucker Balch, *Georgia Institute of Technology*
“How Can AI and Robotics Help Us Understand Social Animal Behavior?”
- * Chitta Baral, *Arizona State University*
“From Knowledge to Intelligence - Building Blocks and Applications”
- * Amy Greenwald, *Brown University*
“Multiagent Learning in Games”
- * Marti Hearst, *University of California Berkeley*
“Faceted Metadata in Search Interfaces”
- * Sridhar Mahadevan, *University of Massachusetts, Amherst*
“Representation Policy Iteration: A Unified Framework for Learning Behavior and Representation”
- * Dana S. Nau, *University of Maryland*
“May All Your Plans Succeed!”

Robot Competition and Exhibition

The 14th annual Robot Competition and Exhibition (<http://aaai.org/Conferences/National/2005/robots05.html>) once again brings together teams from universities, colleges, and research laboratories to compete and to demonstrate cutting edge, state of the art research in robotics and artificial intelligence.

This year the program will include the following events:

- **Robot Challenge** — The goal of the Robot Challenge is to work toward the development an interactive social robot. Toward that end, the challenge requires a robot participate in the AAAI conference. Aspects of conference participation goals include locating the conference registration desk, registering for the conference, performing volunteer duties, and presenting a talk (and answering questions) at a prescribed time and location. Additionally, the robot should socially interact with other conference participants.
- **Scavenger Hunt** — Robots search the conference hotel area for a checklist of given objects such as people or information located at specific locations or at a specific time. This task will require robots to navigate and map a dynamic area with moving objects and people in order to acquire objects and satisfy a checklist.
- **Open Interaction Task** — Robots search the conference hotel area for a checklist of given objects such as people or information located at specific locations or at a specific time. This task will require robots to navigate and map a dynamic area with moving objects and people in order to acquire objects and satisfy a checklist.
- **Robot Exhibition** — The mission of the Robot Exhibition is to demonstrate state of the art research in a less structured environment than the competition events. The exhibition gives researchers an opportunity to showcase current robotics and embodied-AI research that does not fit into the competition tasks.
- **Mobile Robot Workshop** – The robot events culminate with a workshop where participants describe the research behind their entries.

A list of teams entering this year's Robot Competition, representing many leading government and university research groups, can be found on the Website listed above.

XNew!!! First Annual General Game Playing Competition

A new addition to the National Conference on AI is the First Annual General Game Playing Competition (<http://aaai.org/Conferences/National/2005/games05.html>). General game players are computer systems able to accept formal descriptions of arbitrary games and able

to play those games effectively without human intervention. General game playing systems are characterized by their use of general cognitive information-processing technologies (such as knowledge representation, reasoning, learning, and rational behavior). Unlike specialized game playing systems (such as Deep Blue, the chess playing computer system developed by IBM that beat world chess champion Garry Kasparov in 1997), they do not rely on algorithms designed in advance for specific games. A \$10,000 prize will go to the winner. (No human players allowed.)

The Competition

The AAAI competition is designed to test the abilities of general game playing systems by comparing their performance on a variety of games. The competition consists of two phases: a qualification round and a runoff competition.

In the qualification round, entrants play several different types of games, including single player games (such as maze search) and multiplayer games (such as tic-tac-toe or some variant of chess), including games with both competitors and cooperators. In some cases, the game is exhaustively searchable (as in tic-tac-toe); in other cases, this is not possible (as in chess). Players have to handle all of these possibilities. Entrants are evaluated on the basis of consistent legal play and ability to attain winning positions; the best advance to the second round.

In the runoff round, the best of the qualifiers are pitted against each other in a series of games of increasingly complexity. The entrant to win the most games in this round will be the winner of the overall competition.

Note that, prior to the competition, players are told nothing about the games to be played. The rules of all games are transmitted to the players electronically at the beginning of each game. A general game playing system must be able to read the rules for each game, receive runtime information from the game manager, and inform the manager of its moves.

Intelligent Systems Demonstrations

The Intelligent Systems Demonstrations showcase state-of-the-art AI implementations and provides researchers with an opportunity to show their research in action.

This year's 22 demonstrations cover an impressive range of domains: natural language understanding, robotics, game-playing, cognitive aides, Semantic Web, bio informatics, automated deductions, musical indexing, intelligent system design aides, and much more. Examples of applications include:

Anti-terrorism / Emergency response

- Communication and collaboration among various emergency response teams (police, fire, security and other) over an ad hoc urban wireless network testbed in Philadelphia
- A personal cognitive assistant that can acquire expertise in intelligence analysis directly from intelligence analysts, can train new analysts, and can help analysts in their work.

Intelligent Web services

- Swoogle: Searching for knowledge on the Semantic Web

Science / Computer Science / Robots

- Using AI for Cancer Diagnosis and Biomarker Discovery
- Evolution of an Empathetic Digital Entity: Phase One
- Remote Supervisory Control of a Humanoid Robot

Technical conference

The technical conference is targeted for the advanced AI research community. A record 803 papers were submitted to this year's technical conference, a testimony to the vibrancy of the AI research field today. Submissions were received from 40 countries, with 48% coming from outside the US. After rigorous evaluation, 150 papers were accepted for oral presentation, and 79 for poster presentation.

A look at the categories of the accepted papers (and the number of papers within each category -- indicated in parentheses) gives a brief glimpse of the breadth of research agendas currently underway, including:

- Activity and Plan Recognition (5 papers)
- Agents/Multiagent Systems (27)
- Analogical and Case Based Reasoning (6)
- Auctions and Market-Based Systems (5)
- Automated Reasoning (12)
- Constraint Satisfaction and Satisfiability (20)
- Game Theory and Economic Models (5)
- Human-Computer Interaction (6)
- Knowledge Acquisition and Engineering (2)
- Knowledge Representation and Reasoning (19)
- Logic Programming (4)
- Machine Learning (35)
- Machine Perception (6)
- Markov Decision Processes and Uncertainty (12)
- Natural Language Processing and Speech Recognition (15)
- Planning and Scheduling (17)
- Robotics (16)
- Search (10)
- Semantic Web, Information Retrieval, and Extraction (7)

The technical conference also includes 16 tutorials, 14 workshops, 22 intelligent systems demonstrations, 26 student abstract papers, and 16 doctoral consortium presentations.

Highlights from AI Sister Conferences

In an effort to facilitate communication across the many sub areas of AI, AAI-05 will include the first ever track of highlights from AI sister conferences. Representatives from 15 specialized AI conferences will summarize highlights from their most recent gatherings including: artificial intelligence and digital entertainment, intelligent agents, computational linguistics, constraint programming, cognitive science, automated planning and scheduling, case-based reasoning, machine learning, the Semantic Web, intelligent user interfaces, knowledge capture, knowledge discover and data mining, knowledge representation and reasoning, applications of satisfiability testing, and uncertainty.