



Artificial Intelligence Applications Institute

- AIAI is a technology transfer organisation that promotes the application of Artificial Intelligence research for the benefit of commercial, industrial, and government clients
- Based in the leading Artificial Intelligence group in Europe, and one of the top in the world
- Over four decades of world leading research and teaching
- 30 years of innovative applications of Artificial Intelligence



AIAI Key Achievements

- **Formation** - a system to lay out all British Telecom Yellow Pages directories and to create a new business area for Pindar Set Ltd for responsive marketing support and catalogue layout systems. Winner of an award for innovative applications of AI in 1998
- **Expert Provisioner** - a system for the RAF Logistics to assist with procurement of spare parts. Saves £30m per annum for the RAF and subsequently deployed to the British Army and Royal Navy
- **EASE** - system deployed throughout Europe to estimate occupational exposure to hazardous substances for health and safety regulations.
- **Fraud Detection** - Case-Based Reasoning has been applied to screen applications for financial products with MCL Software
- **Ghostwriter** - multilingual support for aero-engine maintenance procedures with British Aerospace and Dassault Aviation (France)
- **O-Plan and I-X** - command, planning and control agents to support non-combatant evacuation operations, US Army military operations in urban terrain, multinational coalition operations, disaster relief, emergency response, Virtual Operation Centres (I-Rooms), etc
- **Optimum-AIV** - planning system for assembly, integration and test of Ariane payloads for the European Space Agency
- **EUMETSAT** - specification of the tele-command system for the European Meteorological Spacecraft Control Centre
- **International Standards** - inputs to the development of standards for process specification, workflow, enterprise modelling, web services, etc





AI AI Technology Areas

- Knowledge-Based Systems: data mining, expert systems, knowledge management, KBS methodology, ontologies
- Planning and Workflow Systems: modelling, task setting, planning, execution, monitoring and coordination of activities
- Adaptive Systems: case-based reasoning: a technique for utilising past experiences and existing corporate resources such as databases to guide diagnosis and fault finding
- Intelligent User Interfaces: intelligent agents, document presentation and argumentation, dynamic creation of content
- Intelligent Virtual Worlds: collaborative workspaces, virtual operations centres, meeting assistants





AI AI Application Areas

- Aerospace
- Petroleum
- Business Intelligence
- Process Support and Workflow
- Logistics and Supply Chains
- Financial Advisory Systems
- Documentation and Layout
- Emergency Response
- Homeland Security
- Bio-Informatics
- Etc.





AIAI Clients & Collaborators

- **AIAI's commercial clients** include: Adobe, AEA Technology, Aldus, Amoco, Arup, BBN Corp, Boeing, Bow Valley, BAE Systems, British Aerospace, British Telecom, Bristol and West Building Society, Building Research Establishment, CISE, Conoco, CRI Denmark, Cycorp, Digital, EADS, Edify, Elf, Enigmatec, European Silicon Structures, ESEC, Exxon, Ford, GEC Marconi, GlobalInfoTek, Hewlett Packard, Hitachi, IBM, ICL Fujitsu, Ilog, Intense Photonics, ISX, Kodak, KPI, Lattice Logic, Lloyd's Register, Lockheed Martin, Logica, MCL Software, Memex Technology, Metier, Motorola, Nationwide, NCR, Nynas, Pilkington, Pindar, Petroleum Science & Technology Institute (PSTI), QinetiQ, Robertson Group, Rolls-Royce & Associates, Royal Bank of Scotland, Schindler Lifts, Seiko, Sharp, Shell, Slam Games, Standard Life, Teknowledge Corp, Texaco, Toshiba Corporation, UBS, Unilever
- **AIAI's government agency clients** include:
 - UK: CCTA, DERA, Dstl, Fire Service College, GCHQ, Health & Safety Executive, Health & Safety Laboratory, Office of the Deputy Prime Minister, RAF
 - Regional Authorities: Greater Manchester Country Fire & Rescue Service, London Fire & Emergency Planning Authority, Greater Manchester Country Fire & Rescue Service
 - Europe: ESA, EUMETSAT
 - USA: DARPA, NIST, NRL, US Army, USAF AFRL, USJFCOM, USPACOM
 - Asia: DSTO, NCHC
- **AIAI academic collaborators** include: CMU, Dartmouth College, Edinburgh Parallel Computing Centre, IHMC, Imperial College London, Institute of High Performance Computing Singapore, MIT, National e-Science Centre, Potomac Institute, SRI International, Stanford University, University of Maryland, University of Michigan, USC/ISI, University of Texas



Oil Related Projects

- EGRESS and MOBEDIC: Modelling Decisions in Emergency Situations – <http://www.aiai.ed.ac.uk/project/egress/>
- PEXES: Petroleum Exploration Expert System - Combining Knowledge and Data in a Tool for the Explorationist – developed by Simon Petroleum Technology and AIAI, with funding from the Petroleum Science and Technology Institute, Amoco, Conoco and the UK Offshore Supplies Office – 1991
- SDBA: Smart Database Access – part of PEXES – 1991 – <http://www.aiai.ed.ac.uk/project/sdba/>
- Directional Drilling Advisor with Sysdrill, Aberdeen, UK – 1992-1993
- ProAct: Planner for Project Management and Contingency Planning – Amoco, SRI International and AIAI – 1993
- SPIRIT: Integrating Knowledge-Based Techniques Into Well Test Interpretation – with Heriot-Watt University Department of Petroleum Engineering – <http://www.aiai.ed.ac.uk/project/spirit/>
- Hedlamp: EPSRC Autonomous and Intelligent Systems (AIS) Programme "Hedlamp" Project – Machine Learning and Adaptation of Domain Models to Support Real Time Planning in Autonomous Systems – 2012-2015 – with University of Huddersfield and Schlumberger. <http://www.aiai.ed.ac.uk/project/hedlamp/>



AIAI Types of Work

- Applied collaborative research
- Develop/tailor generic methods, techniques and tools to meet specific application requirements (foreground IPR retained)
- Key achievements, deployments and widespread interaction with industry, government agencies and other organisations
- Technology transfer via contract research projects, consultancy projects, hands-on workshops, continuing education/visitor programmes, application development and other tailored corporate support
- Affiliate Programme for long-term stable relationships
- Study Programme in AI Applications for visitor project support



International Innovation in AI

- More details at <http://www.aiai.ed.ac.uk>
- Brochures and key achievements at <http://www.aiai.ed.ac.uk/i3ai/>