

**29th February 2008**

**Alan H. Bond**

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HISTORY:**

Business address: Semel Institute for Neuroscience and Human Behavior, NPI  
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Date of birth: 18th October 1940. Place of birth: Stockport, Cheshire, United  
Kingdom

Marital status: divorced, two children

**EDUCATION:**

B.A. Physics (First class honours), Magdalen College, Oxford University, 1961  
M.A. Oxford University, 1966

Ph.D. Theoretical Physics, Imperial College of Science and Technology, London  
University, 1966

**PROFESSIONAL  
EXPERIENCE:**

**Present positions:**

(2005 - present) Research Neuroscientist and Specialist-Cognitive Neuroscience,  
Semel Institute for Neuroscience and Human Behavior, Geffen School of Medicine,  
University of California at Los Angeles, Los Angeles, California

(2005 - present) Visiting professor, National Institute of Standards and Technology,  
Gaithersburg, Maryland

**Previous positions:**

(1966) Research Assistant in Computing Methods, Mathematics Department, Royal Holloway College, London University  
(1966-7) Research Scientist, Computer Science Department, Carnegie Institute of Technology, Pittsburgh  
(1967-8) Visiting Assistant Professor, Computer Science Department, Carnegie-Mellon University, Pittsburgh  
(1968-9) Acting Assistant Professor, Engineering Department, UCLA, Los Angeles  
(1969 - 1984) Lecturer (Corresponds to Assistant and Associate Professor) in Computer Science, Queen Mary College, London University (tenured from 1973)  
(1982) Visiting Research Professor, Image Processing Institute, University of Southern California, Los Angeles  
(1983-5) Senior Research Scientist, Electrical Engineering Systems Department, University of Southern California, Los Angeles  
(1985-1991) Principal Development Engineer, University of California, Los Angeles  
(Feb-Aug 1992) Sony Sabbatical Chair, Sony Computer Science Research Laboratory, Tokyo  
(Sept 1992-Jan 1994) Member of Technical Staff, Computer Systems Research Department, The Aerospace Corporation, Los Angeles  
(Feb 1994 - Dec 1994) Visiting Researcher, Division of Neurosurgery, School of Medicine, and Computer Science Department, University of California, Los Angeles  
(Sept 1995 - June 1996) Instructor, Department of Computer Science, University of California, Los Angeles.  
(Sept 1996 - 2004) Senior Scientist, Departments of Electrical Engineering and Computer Science, California Institute of Technology, Pasadena, California.  
(Sept 1998 - 2004) Lecturer in Computer Science, California Institute of Technology, Pasadena, California.

**Visiting Posts:**

(Summer 1973) Visiting Lecturer, Makerere University, Kampala, Uganda  
(Summer 1980) Visiting Researcher, Computer Science Department, Carnegie-Mellon University, Pittsburgh  
(Summer 1981) Engineer, Naval Ocean Systems Center, San Diego  
(1991) Esprit DAI project IMAGINE. Logic Programming Group, Imperial College, London, PI: Keith Clark.

**HONORS and****SPECIAL****AWARDS:**

Demyship at Magdalen College, Oxford, 1958-1961  
Jenner Exhibition at Magdalen College, Oxford, 1960

**RESEARCH****GRANTS AND****FELLOWSHIPS****RECEIVED:****Funded Projects in the USA**

1. Intelligent Software for the Control of a Submersible Vehicle in carrying out Pipeline Surveillance and Inspection. Funded by Naval Oceans Systems Center, San

Diego, 1983-4. Contract No. N66001-83-C-0039. Value: \$22,000. Objective: Design and implement simple rule-based control system in C for the NOSC Free Swimming Submersible. Results: System delivered to NOSC.

2. A Knowledge Based System for the Design of Testable VLSI Circuit Chips. Principal Investigator: Professor Melvin Breuer. Funded by DARPA. 1985. Objective: Develop methods and system for automatically transforming circuits into testable forms Results: Developed logic method for representing testable circuit techniques.

3. Expert Systems in Computer Aided Design, focus on Sheet Metal Design, Funded by Lockheed Aeronautical Systems Company, Burbank, California. Principal Investigator Professor Michel A. Melkanoff, Associate Investigator A. H. Bond. 1986-1988. \$55,000 per year. Results: CADLOG Intelligent CAD/CAM system developed and application programs written for Automatic model construction, Automatic dimensioning, Design Checking and Process Planning.

4. Artificial Intelligence methods for the Hypercube, Funded by California Institute of Technology, Principal investigator: David Jefferson, Co-Principal: Investigator Alan H. Bond. 1986-June 1990, \$30,000 per year. Results: Study of computer vision on hypercube, DAI survey and bibliography written, DAI logical model developed of commitment and collaborative logic. Simple parallel CAD/CAM system implemented in Strand and run on Symmetry parallel computer.

5. An Intelligent System for Automatic Generation of Manufacturing Process Plans, Funded by IMAR, Institute for Manufacturing and Automation Research Co-PI with M.A.Melkanoff(PI), F.Arbab and B. Khoshnevis. 1987-August 1991, \$160,000 per year. Results: CADLOG intelligent CAD/CAM system developed and process planning programs in Prolog designed and implemented.

6. Intelligent Simulation Systems for Automated Factories, Funded by the National Science Foundation, Co-PI with M.A.Melkanoff(PI), J.K.Cochran and G.T.Mackulak. 1987-August 1991, \$50,000 per year. Results: Intelligent simulation system designed and implemented in Prolog.

7. A Knowledge-based Cost Management System, Funded by IMAR, Institute for Manufacturing and Automation Research. PI: Alan H. Bond, Co-PI: Gordon Shirley, UCLA Graduate School of Management. December 1989-onwards, \$50,000 per year for 3 years. Results: Distributed planning method developed (Project model).

8. A Formal Approach for Product Model Information, Funded by the National Science Foundation, Co-PI with Charles Eastman(PI), UCLA Architecture Department. April 1990-onwards. \$120,000 per year for 3 years. Results: EDM engineering data model scheme described.

9. Distributed logic programming, Funded by IBM and State of California

Microelectronics Initiative. Co-PI with Stott Parker(PI). July 1990 - June 1991. \$14,000. Results: Commitment model developed.

10. Knowledge-based systems in design, Funded by The Aerospace Corporation, PI: Alan H. Bond, Co-Pi: Michael O'Brien. 1993-94. Results: Negotiation logic implemented running over software bus among three Unix machines.

11. A real-time human-coupled multiagent system with reactive social organization, based on biological principles. NSF SGER grant. Digital Society and Technologies program. Award No: 9615071. \$50,000. August 1996 - July 1997. PI: Pietro Perona, Co-Pi: Alan Bond. My brain model was ported to the Caltech system and a number of efficiency methods were investigated, resulting in the cycle time decreasing from 6 seconds to 100 milliseconds.

12. Human-computer interaction with virtual social groups, Funded by NSF. Digital Society and Technologies program. Grant No: IRI-9812714. \$292,878. Sept 1998 - August 2001. PI: Pietro Perona, Co-Pi: Alan Bond. Further system improvements were made and further investigations into modeling social interaction. Problem solving mechanisms were also studied and a natural language mechanism due to Kempen was analysed and implemented in the brain model.

13. ERC-CREST Partnership, Towards consumer telepresence, Funded by NSF. Engineering Research Center award. Grant No: EEC-9730980. \$299,889. March 15th 1998 - August 2001. PIs: Pietro Perona and Demetri Psaltis, Co-Pi: Alan Bond. Research collaboration with Tennessee State University was fostered by trips to Nashville and also students visiting Caltech on SURF awards. The computer system of the Nomad robot was repaired and a complete new system installed, so that it was controlled by wireless ethernet and onboard linux system. A suite of robot programs in C was installed and Prolog was interfaced, allowing control of the robot from Prolog. A tourguide application was studied and a concept of robot as person developed. This was a collaboration with Matt Ashton.

14. "Eye movement system analysis". Caltech President's Award, funded by NASA Jet Propulsion Laboratory. \$40,000. October 2001 - June 2002. PI: Alan Bond. Participated in the design and implementation of a new eye movement measurement system at JPL, initially targeted towards applications for the handicapped. The system was an active infrared system with very high tracking rates capable of following saccades.

15. An investigation into the visual recognition of suspicious intention in human activity, using logical representations and a biologically inspired agent, Funded by the Office of Naval Research, program manager Thomas McKenna, Cognitive, Neural and Social Science and Technology Program. Award No: N000140210900. \$140,000. PI: Alain Martin, Co-Pi: Alan Bond, August 2002 - April 2004. Suspicious activity was characterized by visual features. We developed a visual interface to the brain model.

16. IPA for Alan Bond. Funded by the National Institute of Science and Technology. December 15th 2005 - April 30th 2007. \$140,000. PI: Alan Bond. Research into cognitive ontologies, and interoperability of systems used in neurology and psychiatry, including automatic interpretation of MRI images, as part of the Healthcare initiative at NIST.

17. IPA for Alan Bond. Funded by the National Institute of Science and Technology. May 1st 2007 - April 30th 2008. \$120,000. PI: Alan Bond. Research into logic programming methods in enterprise systems.

18. A computational model of creative problem solving. Funded by the National Science Foundation. August 1st 2007 - July 31st 2008. \$91,000. PI: Alan Bond. Research into information processing mechanisms of creativity, derived from a brain-based model of human cognition.

### **Funded Projects in the United Kingdom**

1. The Investigation of Learning in a Mobile Robot, Funded by: Science Research Council, 1976-8, Value: \$25,000 + overheads, Research Assistant: David Mott, Objective: Investigate a schema learning model based upon Becker's work, Results: Learning system designed and implemented in POP-2, experiments with control of Mark 4 robot demonstrated learning.

2. An Intelligent Camera, Funded by: Central Research Fund of London University, 1978-9, Value: \$1500, Research Assistants: Mark Witkowski, Jim Beard and Roger Brown, Objective: To design and implement a low cost CCD camera with interface to 6800 microprocessor and support software, Results: CCD camera constructed and interfaced to 6800, software for handling and processing images in Fortran, explorations in motion parallax measurement.

3. The Investigation of the use of an Array Processor for Scene Analysis, Funded by: Science Research Council, 1978-80, Value: \$30,000 + overheads, Research Assistant: Philip Marks, Objective: To show how conventional vision mechanisms could be programmed on the ICL Distributed Array Processor, Results: Scene Analysis programs for line finding, region extraction and Waltz line labelling of blocks world images implemented. Real time(1/10 sec) performance and high degree of parallelism attained.

4. A Computer System for Robot Control, Funded by: Science Research Council, 1978-81, Value: \$50,000 + overheads, Research Assistants: David Mott and Roger Brown, Objective: To implement a hierarchical real time robot control system on two LSI11s, Results: System implemented on three LSI11s and an M6809, assemblers, compilers and operating systems installed, communication software written, software for geometry, sensors and display, analysis of partitioning of robot control function, design for blackboard model control system.

5. The Use of Speech in Robot Control, Funded by: Science Research Council in collaboration with ICL, 1979-82, Value: \$70,000 + overheads, Research Assistants: Mark Witkowski, Malcolm Hinsley and Douglas Benn, Objective: ICL to build speech module for isolated word input, QMC to investigate use in robot tasks, Results: Speech system built and delivered by ICL, System interfaced to LSI11 system and debugged, results from systematic experiments with manipulation protocols.

6. Computer Assistance in Teleoperator Control with emphasis on the Remote Viewing Problem, Funded by: United Kingdom Atomic Energy Authority, Harwell, 1979. Value: \$35,000 + overheads, Research Assistant: Roger Brown, Objective: To investigate six practical techniques for remote viewing aid. Results: The six visual techniques implemented, an optical positioning system developed and patented, remotely controlled computer assisted robot vehicle (Mark 5) designed and implemented.

7. A Sensor System for Robot Control, Funded by: Science Research Council, 1980-2, Value: \$25,000 + overheads, (Funding never taken up but project completed), Research Assistants: Mark Burton, Mark Witkowski and David Barnes, Objective: To design and implement a sensory system for the Mark 5 robot, Results: Design and implementation of infrared and sonar proximity systems for Mark 5 robot and PUMA 600 robot. Software detection and grasping package based on blackboard model

8. Intermediate and High Level Vision using an Array Processor, Funded by Science Research Council, 1980-82, Value: \$40,000 + overheads, Research Assistant: Hilary Buxton, Objective: Investigate matching processes on Distributed Array Processor, Results: Graph matching investigated, industrial vision package implemented, new moving edge detector developed and implemented (generalisation of Marr-Hildreth operator to space-time)

9. A Second Generation Industrial Vision System, Funded by Science Research Council in collaboration with Micro Consultants Ltd, 1981-84, Value: \$160,000 + \$80,000 equipment + overheads, Research Assistants: Roger Brown, Chris Rowbury, David Barnes, Objective: Develop a grey scale industrial vision system with hardware support  
Results: Vision system developed in software and subjected to systematic performance tests under differing environments, System delivered to industrial partner.

## **BIBLIOGRAPHY:**

### **BOOKS:**

1. Alan H. Bond, editor. *Machine Intelligence. State of the Art Report*. Pergamon-Infotech, Oxford, 1981.

2. Alan H. Bond and Les Gasser. *Readings in Distributed Artificial Intelligence*. Morgan Kaufmann Publishers, San Mateo, CA, 1988.

3. Kerstin Dautenhahn, Alan H. Bond, Dolores Canamero and Bruce Edmonds. *Socially Intelligent Agents: Creating relationships with computers and robots*. Kluwer Academic Publishers, Norwell, Massachusetts, 2002.

## **RESEARCH PAPERS**

### **RESEARCH PAPERS (PEER REVIEWED)**

#### **Papers On My Brain Model**

1. Alan H. Bond. [\*A Computational Architecture for Social Agents\*](#). In "Proceedings of Intelligent Systems: A Semiotic Perspective, An International Multidisciplinary Conference", National Institute of Standards and Technology, Gaithersburg, MD, Oct 20-23, 1996.

2. Alan H. Bond. [\*A system model of the primate neocortex\*](#). Neurocomputing, vol 26-27, pp. 617-623, 1999

3. Alan H. Bond. [\*Describing behavioral states using a system model of the primate brain\*](#). American Journal of Primatology, vol 49, pp. 315-388, 1999.

4. Alan H. Bond and Michael Raleigh. [\*The integration of motivation\*](#). Behavioral Brain Sciences, vol 22, pp. 518-519, 1999

5. Alan H. Bond. [\*A computational model for natural language processing by the brain\*](#) presented at CNS\*2002 conference, Chicago, July 2002.

6. Alan H. Bond. [\*Modeling social relationship: An agent architecture for voluntary mutual control\*](#), in Kerstin Dautenhahn, Alan H. Bond, Dolores Canamero and Bruce Edmonds. *Socially Intelligent Agents: Creating relationships with computers and robots*. Kluwer Academic Publishers, Norwell, Massachusetts, pp. 29-36, 2002.

7. Alan H. Bond. [\*Problem-solving behavior in a system model of the primate neocortex\*](#), Neurocomputing, vol. 44-46C, pp. 735-742, 2002.

8. Alan H. Bond. [\*An Information-processing Analysis of the Functional Architecture of the Primate Neocortex\*](#), Journal of Theoretical Biology, vol 227, pp. 51-79, 2004.

9. Alan H. Bond. [\*A Computational Model for the Primate Brain based on its Functional Architecture\*](#), Journal of Theoretical Biology, vol 227, pp. 81-102, 2004.

10. Alan H. Bond. [\*Representing episodic memory in a system-level model of the brain\*](#), Neurocomputing, vol 65-66, pp. 261-273, 2005, and presented at CNS\*2004 conference, Baltimore, July 2004.

11. Alan H. Bond. [\*A psycholinguistically and neurolinguistically plausible system-level model of natural language syntax processing\*](#), Neurocomputing, vol. 65-66, pp. 833-841, 2005, and presented at the CNS\*04

Conference, Baltimore, July 2004.

12. Alan H. Bond. *Brain mechanisms for interleaving routine and creative action*, Neurocomputing, vol 69, issues 10-12, pp. 1348-1353, 2006. presented at the CNS\*05 Conference, Madison, Wisconsin, July 2005,

13. Alan H. Bond. *A system-level brain model of spatial working memory and its impairment*, presented at the CNS\*2006 Computational Neuroscience Conference, Edinburgh, Scotland, July 2006.

14. Alan H. Bond. *A System-level Brain Model of Spatial working Memory*, Proceedings of the 28th Annual Conference of the Cognitive Science Society, Vancouver, pp. 1026-1031, August 2006.

15. Alan H. Bond. *A distributed modular logic programming model based on the cortex*, Proceedings of the Workshop on Multivalued Programming Languages, Federated Logic Conference FloC-06, Seattle, August 2006.

16. Alan H. Bond. *BAD, a declarative logic-based language for brain modeling*, Proceedings of the Practical Applications of Declarative Languages Conference, PADL07, editor Michael Hanus, published by Springer-Verlag, LNCS 4354. Conference held at Nice, January 14-15, 2007.

### **Papers On Intelligent Social Agents**

1. Alan H. Bond and Les Gasser. *A survey of distributed artificial intelligence*. In Alan H. Bond and Les Gasser, Readings in Distributed Artificial Intelligence, Morgan Kaufmann Publishers, San Mateo, CA, 1988.

2. Alan H. Bond and Les Gasser. *A subject-indexed bibliography of distributed artificial intelligence*. In Alan H. Bond and Les Gasser, Readings in Distributed Artificial Intelligence, Morgan Kaufmann Publishers, San Mateo, CA, 1988.

3. Alan H. Bond. *The cooperation of experts in engineering design*. In Distributed Artificial Intelligence, Volume II, pages 463-484, 1989. Les Gasser and Michael N. Huhns (editors).

4. Alan H. Bond. *Commitment: Some DAI Insights from Symbolic Interactionist Sociology*. In Miroslav Benda, editor, Proceedings of the 9th Workshop on Distributed Artificial Intelligence, pages 239-261, Bellevue, Washington, September 1989.

5. Alan H. Bond. *Commitment: A Computational Model for Organizations of Cooperating Intelligent Agents*. In Proceedings of the 1990 Conference on Office Information Systems, pages 21-30, Cambridge, MA, April 1990.

6. Alan H. Bond. *Distributed Decision-Making in Organizations*. In Proceedings of the IEEE Systems, Man and Cybernetics Conference, November 1990, Los Angeles, California, pages 896-901, 1990.

7. Alan H. Bond. *Projects: A normative model of collaboration in organizations*. In Proceedings of The Tenth AAAI International Workshop on Distributed Artificial Intelligence, held at The Flying L Ranch, Bandera, Texas, October 23-27, 1990, 1990. proceedings published as MCC Technical Report.

8. Alan H. Bond. *Commitments and Projects*. In Luc Steels and Barbara Smith, editors, Proceedings of the

AISB Conference, Leeds, UK, pages 26-35, 1991.

9. Alan H. Bond and Les Gasser. *A subject-indexed bibliography of distributed artificial intelligence* . IEEE Transactions on Systems, Man and Cybernetics, 22:1260-1281, 1991.

10. Alan H. Bond and Richard Ricci. *Cooperation in aircraft design* . Research in Engineering Design, 4:115-130, 1992.

11. Alan H. Bond. *Modeling social relationship by mutual commitment, mutual control and mutual regulation* . AAAI Fall Symposium 2000. Socially intelligent agents - the human in the loop. 3-5 November, Sea Crest Resort, North Falmouth, MA, USA

### **Papers On Intelligent Robots**

1. Alan H. Bond. *Fast Vision for a Low Cost Computer Controlled Robot*, On Theory and Practice of Robots and Manipulators, edited by Morecki A. and Kedzior K, Proceedings of 2nd CISM-IFTOMM Symposium, P.W.N., Warsaw, 1976.

2. Alan H. Bond and David H. Mott. *Learning in a Mobile Robot* . In Proceedings of International Joint Conference on Artificial Intelligence, Vancouver, pages 159-161, 1981.

3. Alan H. Bond. *The Use of Rule Systems in Teleoperator Control*. In American Society of Mechanical Engineers Second International Computer Engineering Conference, San Diego, 1982.

4. C. Mark Witkowski, Alan H. Bond, and Mark Burton. *The design of sensors for a mobile teleoperator robot* . Digital Systems for Industrial Automation, 2:85-111, 1983.

5. Alan H. Bond and Matt Ashton. *The robot as person* . In Proceedings of WIRE 2000, Workshop on Interactive Robots in Entertainment, Carnegie-Mellon University, April 2000.

### **Papers on Intelligent CAD/CAM**

1. Alan H. Bond, Michel A. Melkanoff, S. Zia Ahmed, Kang J. Chang, Dong H. Kim, and Basuki Soetarman. *Automatic Extraction of Geometric Features from CAD Models* . In Intelligent Manufacturing Systems II, Vladimir R. Milacic (editor), Proceedings of Second International Seminar on Intelligent Manufacturing Systems, August 24-29, 1987, Dubrovnik, Yugoslavia. published by Elsevier. pages 143-160, 1987.

2. Alan H. Bond and Zia Ahmed. *Rule-based automatic dimensioning* . In IEEE WESTEX Conference on Expert Systems Applications 1987, pages 128-135, 1987.

3. Alan H. Bond and Basuki Soetarman. *Integrating Prolog and CADAM to produce an Intelligent CAD System* . In IEEE WESTEX Conference on Expert Systems Applications 1987, pages 152-161, 1987.

4. Alan H. Bond and Rajanish Jain. *The formal definition and automatic extraction of group technology codes* . In SME Meeting on Group Technology, September 1987, El Segundo, 1987.

5. Alan H. Bond and Kang J. Chang. *Feature-based process planning for machining parts* . In ASME

- Conference on Artificial Intelligence in Engineering, volume San Francisco, August 1988, pages 571-576, 1988.
6. Alan H. Bond and Rajanish Jain. *The formal definition and automatic extraction of group technology codes* . In ASME Conference on Artificial Intelligence in Engineering, volume San Francisco, August 1988, pages 537-542, 1988.
  7. Alan H. Bond and Basuki Soetarman. *Multiple Abstraction in Knowledge-based Simulation* . In Proceedings of Simulation and Artificial Intelligence Conference of the Society for Computer Simulation, San Diego, Feb 1988, pages 61-66, 1988.
  8. Alan H. Bond and Kang J. Chang. *The use of manufacturing knowledge in process planning* . In Proceedings of NCGA Conference on Aerospace and Electronics, Santa Clara, California, September 12-15, pages 13-22, 1989.
  9. Michel A. Melkanoff and Alan H. Bond. *Bridging the CAD-CAM gap* . MEP report 8931, University of California, Los Angeles, 1989. presented at Fourth International Conference in Metal Cutting, Non-Conventional Machining and their Automation, Beijing, China, April 25-27, 1989.
  10. Alan H. Bond. *The cooperation of experts in engineering design* . In Distributed Artificial Intelligence, Volume II, pages 463-484, 1989.
  11. Alan H. Bond and S. Zia Ahmed. [Knowledge-based automatic dimensioning](#) . International Journal for Artificial Intelligence in Engineering, 4:32-40, 1989.
  12. Alan H. Bond and Basuki Soetarman. *Integrating Prolog and CADAM to produce an Intelligent CAD System*. Software Practice and Experience, 20:1049-1076, 1990.
  13. Alan H. Bond. *A predicate logic approach to CAD/CAM modeling* . AI/EDAM, 6:39-58, 1992.

## **Papers on Organizations**

1. Alan H. Bond and Richard Ricci. *Cooperation in aircraft design* , 1989. Presented at MIT-JSME Workshop on Cooperative Product Design, MIT, November 1989, published in "Computer-Aided Cooperative Product Development", edited by D. Sriram, R. Logcher and S. Fukuda.
2. Alan H. Bond. *Projects: A normative model of collaboration in organizations* . In Proceedings of The Tenth AAAI International Workshop on Distributed Artificial Intelligence, held at The Flying L Ranch, Bandera, Texas, October 23-27, 1990, 1990. proceedings published as MCC Technical Report.
3. Alan H. Bond. *Distributed Decision-Making in Organizations* . In Proceedings of the IEEE Systems, Man and Cybernetics Conference, November 1990, Los Angeles, California, pages 896-901, 1990.
4. Alan H. Bond. *Commitments and Projects* . In Luc Steels and Barbara Smith, editors, Proceedings of the AISB Conference, Leeds, UK, pages 26-35, 1991.
5. Alan H. Bond. *Satellite Cooperation* , 1993. Presented at USAF Conference on Software for Satellite Autonomy, Albuquerque, New Mexico, July 1993.

## **Papers on Data Modeling**

1. Charles M. Eastman, Alan H. Bond, and Scott C. Chase. *A Formal Approach For Product Model Information* . Research in Engineering Design, 2:65-80, 1991.
2. Charles M. Eastman, Alan H. Bond, and Scott C. Chase. *Application and Evaluation of an Engineering Data Model* , . Research in Engineering Design, 2:185-207, 1991.
3. Charles M. Eastman, Alan H. Bond, and Scott C. Chase. *A Data Model for Engineering Design Databases* . In National Science Foundation Design and Manufacturing Grantees Conference, Austin, Texas, January, 1991. not included in the bound proceedings.
4. Charles M. Eastman, Alan H. Bond, and Scott C. Chase. *A data model for defining databases supporting modular definition of design information* . In Proceedings of Conference of American Society of Civil Engineers, May 1991.
5. Charles M. Eastman, Alan H. Bond, and Scott C. Chase. *A Data Model for Designed Products* . In Louis F. Cohn and William Rasdorf, editors, Computing in Civil Engineering and Symposium on Data Bases, pages 679-688. American Society for Civil Engineering, May 1991.
6. Charles M. Eastman, Alan H. Bond, and Scott C. Chase. *A data model for design databases*. In J. S. Gero, editor, Artificial Intelligence in Design '91, pages 339-365. Butterworth-Heinemann, Oxford, 1991.

## **Papers on Parallel computers**

1. Alan H. Bond. *Parallel computers and vision* . In Rank Prize Funds International Symposium on Physical and Biological Processing of Images, London, pages 349-358, 1982.
2. Alan H. Bond and Hilary Buxton. *The Use of Programmable Parallel Hardware for Industrial Vision* . In Society of Photo-Optical Instrumentation Engineers, Technical Symposium East '82, Arlington, Virginia, 1982.
3. Alan H. Bond. *The use of programmable broadcast architecture for computer vision* . In Parallel Computing 83 conference, Berlin, published 1984, M. Feilmeier, J. Joubert and U. Schendel (eds), North-Holland, Amsterdam. pages 287-292, 1983.
4. Alan H. Bond. *Self-broadcasting arrays - a new computer architecture suitable for easy fabrication* . In Parallel Computing 83 conference, Berlin, 1984 M. Feilmeier, J. Joubert and U. Schendel (eds), North-Holland, Amsterdam. pages 489-494, 1983.
5. Alan H. Bond and David Fashena. *Programming Computer Vision Techniques on the Hypercube* . In The Third Conference on Hypercube Concurrent Computers and Applications, pages 1007-1010, 1988.

## **Papers on Computer vision**

1. Alan H. Bond. *The effect of environmental variation upon the performance of a second generation*

*industrial vision system* . In International Conference and Robotics, Vision and Sensory Control, ROVISEC, Boston, Mass., pages 711-718, 1983.

2. Alan H. Bond. *An industrial vision system recognising overlapping industrial parts using grey scale images under a wide range of lighting conditions* . In Proceedings of SPIE conference, San Diego, pages 120-128, 1983.

3. Alan H. Bond, Roger S. Brown, and Chris Rowbury. *A Real-Time Industrial Vision System* . In Proceedings of Third International Conference on Artificial Intelligence and Information-Control Systems of Robots, I.Plander(ed), North-Holland, Amsterdam, pages 97-100, 1984.

4. Daniel D. Sheu and Alan H. Bond. [A Generalized Method for 3-D Object Location From Single 2-D Images](#) . Pattern Recognition, 25:771-786, 1992.

### **Other publications**

1. Alan H. Bond. [A Systematic Study of the Balazs Bootstrap Method](#) . Physical Review, Second Series 147:1058-1070, 1966.

2. Alan H. Bond. *Interactive Programming at Carnegie Tech* . In Machine Intelligence 3 , edited by Donald Michie, Edinburgh University Press, Edinburgh, Scotland}, pages 257-267, 1968.

3. Alan H. Bond, Jerry Rightnour, and L. Steven Coles. [An Interactive Graphical Display Monitor in a Batch Processing Environment with Remote Entry](#) . Communications of the ACM, 12:595-603, 1969.

4. Alan H. Bond. *A Descriptor Indexed Bibliography of Computer Chess* . In Computer Chess edited by Bell A.G., Proceedings of Science Research Council Conference, 1973.

5. Alan H. Bond. *Psychology and Computer Chess*. In Computer Chess edited by Bell A.G., Proceedings of Science Research Council Conference, 1973.

6. Alan H. Bond. *AI simplifies banker/customer relationships* Applied Artificial Intelligence Reporter, April 1987, pages 9 and 11.

7. David Devault and Alan H. Bond. [A flexible eyetracker for psychological applications](#) . In Proceedings of Fifth IEEE Workshop on Applications of Computer Vision WACV2000, Palm Springs, California, 4-6 December 2000, pp. 201-206.

### **RESEARCH PAPERS - NON-PEER REVIEWED**

1. Alan H. Bond, Shirley Reilly, and Paul Heckman. *Software reference manual for free swimmer submersible vehicle* . Technical report, Ocean Technology Department, Naval Ocean Systems Center, San Diego, 1982.

2. Alan H. Bond and David H. Mott. [An investigation of a learning system with a mobile robot](#), 1985.

3. Alan H. Bond. [Broadcasting Arrays - A Highly Parallel Computer Architecture Suitable For Easy](#)

*Fabrication*, 1987.

4. Alan H. Bond and Mark Burton. *Stream Architecture and its Application to a Real Time Computer Vision System*, 1989.

5. Alan H. Bond. *A Negotiation Logic System*. . Technical Report, The Aerospace Corporation, 1992.

6. Alan H. Bond and Frank G. McCabe. *April for the not so foolish: A Tutorial and User's Guide*, Technical report, Caltech and Fujitsu Network Agents Research Group, December 1999.

7. Alan H. Bond. *Toward a system-level model of episodic memory*, presented at Joint Symposium on Neural Computation, UCLA, May 14th 2005.

## **ABSTRACTS**

1. Alan H. Bond. *A computational model for the primate brain based on its functional architecture*. Society for Neuroscience Conference, New Orleans, Louisiana, 1997

2. Alan H. Bond. *Problem-solving and memory mechanisms in a systems-level model of the primate brain*. Society for Neuroscience Conference, San Diego, California, November 1998.

3. Alan H. Bond. *A psycholinguistically and neurolinguistically plausible computational model of natural-language processing by the human brain*. Society for Neuroscience Conference, San Diego, California, November 2001.

4. Alan H. Bond. *Learning of problem-solving strategies by a system-level model of the cortex*. Society for Neuroscience Conference, Orlando, Florida, November 2002.

## **UNPUBLISHED POSITION PAPERS:**

see <http://www.exso.com/position.html>

1. Alan H. Bond. *An approach to artificial intelligence*, 1979.

2. Alan H. Bond. *What I have in mind*, 1990.

## **PAPERS IN PREPARATION:**

1. Alan H. Bond. *Modeling mental dynamics: and mundane properties of consciousness*, to be submitted to Journal of Consciousness Studies. Derives some properties of consciousness from the dynamics of my brain model.

2. Alan H. Bond. *A system-level model of spatial working memory*, A report on design, implementation and matching to data for normals and schizophrenics.

3. Alan H. Bond. *Myths for brain modeling*, A discussion of fundamental assumptions used in my approach.

4. Alan H. Bond. *Using a brain model to develop an ontology for neuropsychology and cognitive psychology*,

Discusses how to develop a foundational ontology based on information processing concepts, from my brain modeling ideas.

5. Alan H. Bond. *Variation and cooperation in cognitive ontologies*, Discusses how cognitive ontologies change with time and how different levels of ontology need to interact.

### **BOOK IN PREPARATION:**

Alan H. Bond. *Brain science, or A Computer Science for the Brain*. Rough draft manuscript of a complete book on my approach.

### **STUDENTS' THESES:**

(These are included, as, at London University, a professor may not put his name on any work by any of his students.)

#### **Ph.D. Theses**

1. Lawrence Shafe, "Process Models of Natural Language Semantics", London University, 1976.
2. Tunch Balman, "General Problem Solving Techniques for Recognition", London University, 1976.
3. John J. Scott, "High Level Machines and the INTELL Programming System", London University, 1978.
4. Duncan F. Gillies, "A Theory of Information Storage in the Central Nervous System", London University, 1978.
5. David H. Mott, "Sensory-motor Learning in a Mobile Robot", London University, 1980.
6. Michael H. M. Turner, "A Model of the Visual Perception of Surface Layout through Motion", London University, 1982.
7. Nicolas Williams, "Parallel Computer Mechanisms for Computer Vision", London University.
8. C. Mark Witkowski, "Computer Learning using a Rule-based Representation", London University, in preparation.
9. Daniel Sheu, "Model Based Three Dimensional Object Recognition using Generalized Features", UCLA, June 1989, de facto advisor (joint with Prof. Melkanoff)
10. Kang J. Chang, "Knowledge-based Process Planning for Machining Parts". UCLA, June 1989, de facto advisor (joint with Prof. Melkanoff).
11. Basuki Soetarman, "Logic Approach to Factory Simulation" (approx title). UCLA, December 1989, de facto advisor (joint with Prof. Melkanoff).

#### **Masters Theses**

1. Ray Barker, "Psychological Models of Halma Playing", London University, 1973.
2. John J. Scott, "Adaptive Data Structures", London University, 1974.
3. Phil Marks, "An Implementation of a Fuzzy Set Language", London University, 1974.
4. Alan W. Beard, "Frame Representations for Semantic and Visual Understanding", London University, 1976.
5. Roger Carsley, "An Implementation and Criticism of Purr-Puss", London University, 1976.
6. Keith A. Simpson, "Purr-Puss the Criticism and After", London University, 1977.
7. Paul Bradshaw, "Robot Path Finding", London University, 1977.
8. Hanno S. Fairburn, "Knowledge Structure and Search in Machine Vision", London University, 1978.
9. Roger S. Brown, "An Intelligent Camera", London University, 1978.

10. Alan S. Jolley, "An Empirical Study of Robot Control", London University, 1978.
11. Jay J. Sarah, "Learning using a Production System", London University, 1978.
12. James Beard, "Interfacing the CCD Camera", London University, 1978.
13. Shandor Szabo, "Textures in Computer Vision", London University, 1979.
14. Nicolas Taylor, "A Functional Model of the Hippocampus", London University, 1979.
15. Mark Wallace, "An Exegesis of Winograd's Natural Language Suite", London University, 1979.
16. Plutarco Naranjo, "An English to Spanish Mechanical Translator Prototype", London University, 1980.
17. Nicolas Williams, "STM - a Computer Simulation of Morton's Functional Model of Short Term Memory", London University, 1980.
18. David P. Barnes, "The Use of Proximity Sensors in Robot Manipulation", London University, 1981.
19. George Georgiou, "Robot Navigation in a Partially Unknown Environment", London University, 1981.
20. Martin Jacquez, "An Intelligent Mobile Robot", USC, December 1982.
21. Rajanish Jain, "Formal Definition and Automatic Extraction of Group Technology Codes", UCLA, 1988, de facto advisor (joint with Prof. Melkanoff) .

### **ROBOTICS PROJECTS:**

1. 1972-1984, Artificial Intelligence and Robotics Laboratory at Queen Mary College. Supervised the development of several autonomous robotic vehicles.
2. 1981-1984, Free swimmer project at Naval Oceans Systems Center, San Diego. Team leader: Paul Heckman. Developed software for submersible vehicle.
3. 1984-1985, University of Southern California, Developed experimental robotic vehicle, with Geoffrey Shifflet.
4. 2001-3, California Institute of Technology. Commissioned Nomad robot vehicle and interfaced intelligent software, with Matt Ashton.

### **TECHNICAL REPORTS FROM RESEARCH GROUPS:**

1. Report series from the Artificial Intelligence and Robotics Laboratory, Queen Mary College, 1974-1984, see <http://www.exso.com/qmc.html>
2. Report series from the Intelligent CAD/CAM Research Group, at UCLA, 1985-1991, see <http://www.exso.com/ucla.html>

### **TEACHING:**

For details of my Caltech courses, see <http://www.exso.com/courses.html>

#### **Courses taught:**

1. Brain models and multiagent systems. at advanced undergraduate level, California Institute of Technology, Winter and Spring quarters, 2002.
2. Logic programming and artificial intelligence. at advanced undergraduate level, California Institute of Technology, Fall quarter, 2002.
3. Functional programming, logic programming and multiagent systems at advanced undergraduate level, California Institute of Technology, Fall, Winter and Spring quarters, 1998-2001.
4. Computational modeling of biological systems at advanced undergraduate level, California Institute of Technology, Fall, Winter and Spring quarters, 1998-2001.
5. Metaphorical programming. The Art Center, Pasadena, Industrial design program, co-taught with Michael Dobry. Fall and Spring semesters, 2001-2.
6. Scheme at freshman computer science level, UCLA, Winter and Spring quarters 1995.

7. Introduction to databases at 3rd and 4th year undergraduate level, UCLA, Spring quarter 1995.
8. Artificial Intelligence at 2nd, 3rd and 4th year undergraduate levels - London University 1970-1984, USC CS461 1982.
9. Expert Systems at graduate level - EE599 at USC 1982-85. USC made a video course of my lectures which was sold.
10. Programming Languages at second year undergraduate level - London University 1970-1976, at CMU 1967.
11. Representation of data structures at second year undergraduate level - London University 1976-80.
12. Introductory programming at first year undergraduate levels, for computer scientists - London University 1978, UCLA 1968, for engineers - London University 1975-1980.
13. Masters level courses in Artificial Intelligence (72 hours) - London University 1976-84.
14. Masters level reading courses in Brain Theory, and in Robotics - London University 1978-1981.

**Course design:** All these courses were developed for the first time by me. They were taught every year in the intervals indicated. They are all 36 hours presentation time unless otherwise indicated.

**Evaluations:** Although in London I voluntarily used student feedback forms designed by myself, the only independently administered student questionnaires have been done in the US, namely: (i) EE599 at USC in 1984, this gave an above average evaluation (ii) CS22 at UCLA, an overall rating of 6.5 which was well above average, and (iii) at Caltech in 2001, I had a three year review of my teaching and was given high scores and my position renewed.

**Teaching the teachers:** Tutor in three day courses at the London University Teaching Methods Research Unit, which help beginning professors to become more aware of teaching techniques.

## **RESEARCH MANAGEMENT:**

### **Managing Artificial Intelligence Laboratory**

Built the Artificial Intelligence Research and Teaching Laboratory at Queen Mary College, University of London. Nine Completed Funded Projects in Artificial Intelligence and Robotics. Obtained funding, directed research, developed teaching programs at B.Sc. and M.Sc. levels. Laboratory produced over 250 technical reports and six Ph.D s. Developed approach to artificial intelligence based on computer system design for autonomous intelligent mobile robots.

### **Intelligent CAD/CAM group**

Ran Intelligent CAD/CAM research group at UCLA for four years. About 100 technical reports and 3 PhDs. Developed approach to computer-aided design and manufacturing based on logic-based representations and models of cooperation of distributed experts.

### **Industrial Liaison**

Cooperation with Xerox, El Segundo, on cost management (one year),  
Lockheed, Burbank, on concurrent design (four years),  
Rockwell, El Segundo, and Rocketdyne, Canoga Park, on process planning (one year so far).  
Collaboration with Naval Oceans Systems Center, San Diego, on submersible vehicle control.  
Industrial Collaborations in the UK with United Kingdom Atomic Energy Authority (remote viewing) and with Microconsultants (Quantel), Ltd. (industrial vision).