Curriculum Vitae

John Levine

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Name:	**Dr John Michael LEVINE**
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Date of birth:	2nd December 1963
Current post:	Informatics Research Fellow (AR2)

Degrees Awarded

M.A. in Natural Sciences and Computer Science, St Catharine's College, University of Cambridge, June 1986.

M.Phil. in Computer Speech and Language Processing, Department of Engineering, University of Cambridge, October 1987.

Ph.D. in Computer Science, Computer Laboratory, University of Cambridge, July 1992.

Appointments Held

April 1990 – February 1997: Research Associate (AR1A), Department of Artificial Intelligence, University of Edinburgh.

February 1997 – present: Research Fellow (AR2), Centre for Intelligent Systems and their Applications, University of Edinburgh.

Profile

Dr. John Levine is an Informatics Research Fellow working on evolutionary computation, swarm intelligence, machine learning, and automated planning and scheduling. His current research program consists of applying evolutionary and adaptive computation techniques to real-world problems in AI planning, adaptive scheduling, data analysis and modelling, and Grid computation for e-Science. He has an MA in Computer Science, an MPhil in Computer Speech and Language Processing, and a PhD in Computer Science, all from the University of Cambridge.

Dr. Levine is a member of the EPSRC Review College 2003-05, a member of the review board of Applied Intelligence Journal and was the chair of the PLANSIG 2001 conference on AI Planning and Scheduling systems. He is the node coordinator for the Edinburgh node of PLANET, the European Network of Excellent in AI Planning, and also the main point of contact for the Edinburgh node of EvoNET, the European Network of Excellence in Evolutionary Computing. He is a member of the recently funded EPSRC Research Cluster in Swarm Intelligence and will be leading Edinburgh's contribution to this work.

Dr. Levine leads the Evolutionary Computation and Swarm Intelligence group at the Centre for Intelligent Systems and their Applications, which consists of 13 research students (8 PhD, 5 MSc) who are investigating various aspects of adaptive search and learning applied to problems in AI planning, optimisation and machine learning. The group holds a weekly seminar which is attended by other EC researchers in Edinburgh working on problems in bioinformatics, robotics, artificial life and machine learning. The group is growing rapidly, with 5 new PhD students joining the group in October 2003.

Dr. Levine is the author of over 50 publications on artificial intelligence and evolutionary computation. He has taught a wide range of undergraduate and postgraduate courses in Informatics, including Genetic Algorithms and Genetic Programming, Common Lisp, Planning and Search, Knowledge Representation, Fuzzy Logic and Practical Reasoning Methodologies.

Teaching Experience

I have been lecturing in Informatics at Edinburgh since October 1998. I have now lectured five different modules and was course organiser of a large undergraduate course for two years. I have supervised 31 MSc and Honours projects (all successful).

Lecturing

- Honours/MSc Genetic Algorithms and Genetic Programming (2001-2003), 9-week module. I wrote a complete set of new lectures for this module, including two taken directly from my own research. I further redesigned the module for 2002 with new tutorial exercises and two new lectures taken from my own research.

- MSc Programming in Lisp (2000), 9-week module. I redesigned this module, basing much of the material on AIAI's very successful commercial Common Lisp training course.

- Honours Knowledge Representation and Inference (1998, 1999), 9-week module. I wrote a complete new set of lectures and tutorial exercises for this module.

- 1st year Knowledge Representation and Inference (2000), 2 week module. This was already a mature and well-liked module, but I added one new lecture to the existing material.

- 1st year Planning and Search (2001), 4 week module. I redesigned about half the lecture material for this module, and included one new lecture from my own research.

Teaching Administration

I was the course organiser for Artificial Intelligence 1 from October 1999 to June 2001. This is an undergraduate course which attracts approximately 200 students. It is a preparatory course for all undergraduates taking Artificial Intelligence 2 in their second year. During my second year as course organiser, I reorganised the order of the material to give better understanding of the introductory programming, while also reducing the load on lecturing staff through a reduction in number of the assessed exercises.

Research

Major Research Interests

My overall research goal is to apply ideas from evolutionary and adaptive systems research to problems in AI planning, adaptive scheduling, data analysis and modelling, and Grid computation for e-Science. The techniques used offer robust performance for search, optimisation and machine learning; the problems my group is tackling offer opportunities for exploring and extending the techniques in all three of these areas.

The members of the Evolutionary Computation Group are currently investigating the use of various evolutionary and adaptive techniques (genetic algorithms, genetic programming, ant colony optimisation, neural networks) in solving real-world problems, such as AI planning, adaptive scheduling, bioinformatics, data analysis and model induction, fuzzy rule induction and Grid applications. Some research themes which are emerging in our work are as follows:

- The use of complex adaptive systems consisting of communities of simple agents. We take inspiration from the information processing and problem solving abilities of biological communities and use this in the solution of hard computational problems.

- Hybrid systems consisting of evolutionary computation with local neighbourhood search. The two techniques can complement each other very well if a good coupling can be found.

- Hybrid symbolic-adaptive systems, where symbolic knowledge (ontologies, knowledge bases) is used alongside adaptive and evolutionary search techniques.

- The induction of empirical predictive models from data using swarm intelligence, neural networks, genetic programming and support vector regression. We have applied

these ideas in bioinformatics, for the induction of gene expression networks from microarray data, and in ecology, for learning predictive models of carbon dioxide fluxes over forests using environmental data.

- The induction of declarative knowledge for solving symbolic problems and forming predictive models using evolutionary and adaptive search techniques.

Research Grants and Project Leadership

I have listed here all major grants which I have played a significant part in securing and/or leading. I have included consultancy work and commercial work only where this is relevant to my overall research aims.

Grants Awarded

- Co-Investigator (with Austin Tate), Coalition Agents Experiment (CoAX), awarded under the DARPA Control of Agent-Based Systems program, $800,000, Feb 2000 – Dec 2002.

- Principal grant holder and project leader: Preparation of Continuing Professional Development Courses (Artificial Intelligence Programming in Java, Genetic Algorithms and Genetic Programming) funded by SHEFC via the Office of Lifelong Learning, £35,205, Jul 2001 – Sep 2002.

- Principal grant holder and project leader: Collaborative Requirements Capture Tool Extension, funded by Racal Instruments Ltd., £20,000, Jan 1998 – Sep 1998.

- Principal grant holder and project leader: Coalition Joint Planning Aids, funded by the Defense and Evaluation Research Agency (DERA), £18,000, Dec 1999 – Nov 2000.

- Principal grant holder and project leader: A Web-Based Repository of Applied Planning and Scheduling Research, funded by the European Union under the PLANET, the European Network of Excellence in AI Planning, 20,500 Euros, Feb 2003 – Jul 2003.

Project Leadership

- Research fellow and technical project leader: Collaborative Requirements Capture Tool (CORECT) project, a £1.1M collaboration between Racal Instruments Ltd., Racal Research Ltd., Intelligent Applications Ltd. and the Universities of Edinburgh and Sussex, jointly funded by EPSRC and the Department of Trade and Industry, Oct 1993 – Jan 1997.

Grants Proposals under Review

- Co-Investigator: The Use of Data-Mining Techniques for the Automatic Formation of Tactics, submitted to EPSRC, £88,192, Nov 2003 – Nov 2005. The PI on this grant proposal is Alan Bundy and the named research student is Hazel Duncan.

Grant Proposals in Preparation

- Co-Investigator, A Toolkit for the Automatic Discovery of Gene Expression Networks, to be submitted to EPSRC, Jan 2004 – Jan 2007. The PI on this grant proposal will be Douglas Armstrong and the named research student will be Mark Cumiskey.

- Co-Investigator, An Investigation into Dynamic Tracking and Scheduling of Vehicle Fleets, to be submitted to EPSRC, Jan 2004 - Jan 2006. The PI on this grant proposal will be Andrew Sherlock of the School of Engineering.

- Co-Investigator, Smart Personalised Access to the Grid using AI Planning and Dynamic Scheduling, in collaboration with Maria Fox and Derek Long (Durham) and Dave Berry (National e-Science Centre, Edinburgh), to be submitted to the EPSRC under the e-Science initiative.

- I am actively pursuing a number of grant applications associated with the Swarm Intelligence cluster, to be submitted to the EPSRC in January 2004. These are in the area of characterising the computational problem solving abilities of social insect colonies and the possible applications of this in data mining, bioinformatics and network/grid computing.

Commercial Work and Consultancies

I have performed commercial and consultancy work for the following organisations and companies: British Aerospace, British Telecom, the Imperial Cancer Research Fund, Racal Instruments, ISX Corporation, GEC Marconi Avionics, DERA and the Royal Air Force.

Professional Contributions

- Member of the EPSRC Review College, 2003-2005

- Programme Chair, 20th Workshop of the the UK Planning and Scheduling Special Interest Group (PlanSIG 2001), Edinburgh, December 2001

- Member of the Review Board for International Journal of Applied Intelligence

- Node coordinator and main point of contact for the University of Edinburgh Node of PLANET, the European Network of Excellence in AI Planning

- Main point of contact for the University of Edinburgh Node of EvoNet, the European Network of Excellence in Evolutionary Computing

- Programme Committee, EvoSTIM 2003, April 2003

- Programme Committee, PlanSIG 2002, December 2002

- Programme Committee, EvoSTIM 2002, April 2002

- Programme Committee, UK Workshop on Computational Intelligence (UKCI-01), September 2001

- Programme Committee, ICAI-01 Workshop on Learning and Adapting in Planning

- Reviewer for the Journal of Automated Reasoning

- Reviewer for the Journal of Artificial Intelligence Research

- Reviewer for International Joint Conference on Artificial Intelligence (IJCAI-01), August 2001

- Reviewer for European Conference on Planning (ECP-01), September 2001

Invited Seminars

I have given invited seminars on my work at:

- Advanced Computation Laboratory, Imperial Cancer Research Fund, 1994.

- The 10th Young Operational Research Conference (Young OR10), 1997.

- Unicom Seminar on Multi-Agent Planning, London, 1998.

- Informatics Jamboree, University of Edinburgh, 2002.

Research Supervision

I am first supervisor to the following four PhD students:

- Henrik Westerberg, October 2000, Genetic Programming for the Creation and Optimisation of Plans

- Georgios Yannakakis, October 2001, Emerging Multi-Agent Behaviours in Complex Environments using Evolutionary Computation

- Mark Collins, July 2002, The Use of Reduced Entropy Node Selection Methods in Genetic Programming

- Tom McCallum, October 2002, Ant Colony Optimisation applied to Generic Planning Problems

I am second supervisor for the following four PhD students:

- Clauirton Siebra, October 2001, A Coalition-Based Approach to Support Relief Operations (with Austin Tate, School of Informatics).

- Natasha Lino, October 2001, Plan Delivery and Visualisation in Collaborative Environments (with Austin Tate, School of Informatics).

- Hazel Duncan, October 2002, Data Mining Techniques for the Automatic Formation of Proof Tactics (with Alan Bundy, School of Informatics).

- Michelle Galea, October 2002, Ant Colony Optimisation applied to Rule Induction (with Qiang Shen, School of Informatics).

Project Supervision

I have supervised the following honours and MSc research projects:

1998: Steve Willmott, MSc

1999: Eva Safar, MSc
Francis Chantree, MSc

2000: Henrik Westerberg, AI/CS4
Alex Nixon, MSc
Lea Ruscio, MSc
John Gair, MSc
Kenny Marshall, MSc
Caroline Rogers, MSc

2001: Mark Collins, AI/CS4
Frederick Ducatelle, MSc
Sunil Kothari, MSc
Kushan Nammuni, MSc
John Lawson, MSc
Alejandro Gonzalez-Romero, MSc

2002: Anna Griffiths, AI/Maths4
Tom McCallum, AI/CS4
Georges Necer-Lisboa, AI/CS4
Martin Clarke, AI/CS4
Alan Stubbs, MSc
Natalia Villanueva-Rosales, MSc
David Humphreys, MSc
Daniel Costich, MSc
Mark Cumisky, MSc (with Douglas Armstrong)

2003: Cathy McGill, AI/Maths4
Tom Baker, AI/CS4
Giorgos Petkos, MSc
Graham Ritchie, MSc
Arnkell Petursson, MSc
Jeong Keun Park, MSc
Michael Good, MSc (with Douglas Armstrong)

Internal Examining

I have been appointed as the internal PhD examiner for the following five PhD students: DaeEun Kim (IPAB), Joao Cavalcanti (CISA), Emma Hart (AIAI), Elias Biris (CISA) and John Atkinson-Abutridy (CISA).

Publications

Levine, J. and Ducatelle, F. (2003). Ant Colony Optimisation and Local Search for Bin Packing and Cutting Stock Problems. *Journal of the Operational Research Society*, Special Issue on Local Search Techniques, accepted subject to minor revisions.

Levine, J. and Ducatelle, F. (2003). Ants Can Solve Difficult Bin Packing Problems. *Proceedings of the 1st Multidisciplinary International Conference on Scheduling: Theory and Applications (MISTA 2003)*, Nottingham, UK, August 13-16th.

Westerberg, H. and Levine, J. (2003). Apollo 13: A Challenge Domain for the Planning Community. *Proceedings of the Workshop on the Planning Competition held at the 13th International Conference on Automated Planning and Scheduling (ICAPS'03)*, Trento, Italy, June 9-13th.

Yannakakis, G., Levine, J., Hallam, J. and Papageorgiou, M. (2003). Performance, Robustness and Effort Cost Comparison of Machine Learning Mechanisms in *FlatLand*. *Proceedings of the 11th Mediterranean Conference on Control and Automation (MED'03)*, Rhodes, Greece, June 18-20th.

Cumiskey, M., Levine, J. and Armstrong, D. (2003). Gene Network Reconstruction Using a Distributed GA with a Backprop Local Search. In Raidl, G. et al. (eds.) *Applications of Evolutionary Computing: EvoWorkshops 2003*, LNCS 2611, Springer.

Levine, J. and Humphreys, D. (2003). Learning Action Strategies for Planning Domains using Genetic Programming. In Raidl, G. et al. (eds.) *Applications of Evolutionary Computing: EvoWorkshops 2003*, LNCS 2611, Springer.

Garcia, S., Levine, J. and Gonzalez, F. (2003). Multi Niche Parallel GP with a Junk-code Migration Model. In Ryan, C., Soule, T., Keijzer, M., Tsang, E., Poli, R. and Costa, E. (eds.) *Genetic Programming: 6th European Conference*, LNCS 2610, Springer.

Tate, A., Dalton, J., Levine, J. and Nixon, A. (2003). Task Achieving Agents on the World Wide Web. In Fensel, D., Hendler, J., Lieberman, H. and Wahlster, W. (eds.) *Spinning the Semantic Web*, MIT Press.

Nammuni, K., Levine, J. and Kingston, J. (2002). Skill-based Resource Allocation using Genetic Algorithms and Ontologies. *Proceedings of the International Workshop on Intelligent Knowledge Management Techniques (I-KOMAT 2002)*, IOS Press, Amsterdam.

Levine, J. (ed.) (2001). *PLANSIG 2001: Proceedings of the 20th Workshop of the UK Planning and Scheduling Special Interest Group.* Edinburgh, UK, December 13-14th.

Westerberg, H. and Levine, J. (2001). Optimising Plans using Genetic Programming. *Proceedings of the UK Workshop on Computational Intelligence (UKCI-01)*, Edinburgh, UK, September 10-12th.

Ducatelle, F. and Levine, J. (2001). Ant Colony Optimisation for Bin Packing and Cutting Stock Problems. *Proceedings of the UK Workshop on Computational Intelligence (UKCI-01)*, Edinburgh, UK, September 10-12th.

Westerberg, H. and Levine, J. (2001). Optimising Plans using Genetic Programming. *Proceedings of the 6th European Conference on Planning (ECP-01)*, Toledo, Spain, September 12-14th.

Westerberg, H. and Levine, J. (2001). Investigation of Different Seeding Strategies in a Genetic Planner. In Boers, E. et al. (eds.) *Applications of Evolutionary Computing: EvoWorkshops 2001*, LNCS 2037, Springer.

Willmott, S., Richardson, J., Bundy, A. and Levine, J. (2001). Applying Adversarial Planning Techniques to Go. *Theoretical Computer Science*, Vol. 252, No. 1-2, February 2001, Elsevier, 45–82.

Westerberg, H. and Levine, J. (2000). GenPlan: Combining Genetic Programming and Planning. *Proceedings of the 19th Workshop of the UK Planning and Scheduling Special Interest Group (PLANSIG 2000)*, Open University, Milton Keynes, UK.

Ruscio, L., Levine, J. and Kingston, J. (2000). Applying Genetic Algorithms to Hierarchical Task Network Planning. *Proceedings of the 19th Workshop of the UK Planning and Scheduling Special Interest Group (PLANSIG 2000)*, Open University, Milton Keynes, UK.

Nixon, A., Levine, J. and Tate, A. (2000). Limited Media Interface for AI Planning System. *Proceedings of the 19th Workshop of the UK Planning and Scheduling Special Interest Group (PLANSIG 2000)*, Open University, Milton Keynes, UK.

Levine, J., Tate A. and Dalton, J. (2000). O-P³: Supporting the Planning Process using Open Planning Process Panels. *IEEE Intelligent Systems*, Vol. 15, No. 5, September/October 2000, 56–62.

Tate, A., Dalton, J. and Levine, J. (2000). O-Plan: a Web-based AI Planning Agent, AAAI-2000 Intelligent Systems Demonstrator, in *Proceedings of the National Conference of the American Association of Artificial Intelligence (AAAI-2000)*, Austin, Texas, USA.

Tate, A., Levine, J., Jarvis, P. and Dalton, J. (2000). Using AI Planning Technology for Army Small Unit Operations. *Proceedings of the Fifth International Conference on Artificial Intelligence Planning and Scheduling (AIPS-2000)*, AAAI Press, 379–386.

Tate A., Levine, J., Dalton, J. and Aitken, S. (1999). O-P³: Supporting the Planning Process using Open Planning Process Panels. *Proceedings of the AAAI-99 Workshop on Agent Based Systems in the Business Context*, Orlando, USA, July 1999.

Tate, A., Dalton, J., Levine, J. and Jarvis, P., (1999). Using Shared Models of Activity to Underpin Coalition Planning. *Proceedings of the International Workshop on Knowledge-Based Planning for Coalition Forces*, Edinburgh, Scotland, May 1999.

Tate, A., Dalton, J. and Levine, J. (1999). *Multi-Perspective Planning – Using Domain Constraints to Support the Coordinated Development of Plans.* Technical Report AFRL-IF-RS-TR-1999-60, Air Force Research Laboratory, Rome, NY, USA, April 1999. Available from the U.S. National Technical Information Service (NTIS).

Willmott, S., Richardson, J., Bundy, A., and Levine, J. (1999). An Adversarial Planning Approach to Go. In H.J. van den Herik and H. Iida (eds.), *Computers and Games: First International Conference*, LNCS 1558, Springer, 93–112.

Tate A., Levine, J., Dalton, J. and Aitken, S. (1998). O-P³ – Open Planning Process Panels. Proceedings of the ARPI Fall Workshop, Washington DC, USA, October 1998.

Tate, A., Dalton, J. and Levine, J. (1998). Generation of Multiple Qualitatively Different Plan Options. *Proceedings of Fourth International Conference on AI Planning Systems (AIPS-98)*, Pittsburgh, USA, 27–34.

Reiter, E., Mellish, C. and Levine, J. (1998). Automatic Generation of Technical Documentation. In Maybury, M. and Wahlster, W. (eds.) *Readings in Intelligent User Interfaces*, Morgan Kaufmann, 141–156.

Willmott, S., Bundy, A., Levine, J. and Richardson, J. (1998). Adversarial Planning in Complex Domains. DAI Research Paper 889, Department of Artificial Intelligence, University of Edinburgh.

Rogers, I., Levine, J., Pattison, C. and Plowman, L. (1996). The Collaborative Requirements Capture Tool: A Multiparadigm Solution to a Real-World Problem. In Macintosh, A. and Cooper, C. (eds.) *Applications and Innovations in Expert Systems IV (Proceedings of Expert Systems 96, Applications Stream)*, SGES Publications, 55–68.

Levine, J., Rogers, I., Bennington, A. and Pattison, C. (1996). Class Hierarchies as a Multi-Purpose Knowledge Representation in a Requirements Capture and Design Tool. In Nealon, J. and Hunt, J. (eds.) *Research and Development in Expert Systems XIII (Proceedings of Expert Systems 96, Technical Stream)*, SGES Publications, 255–272.

Rogers, I., Levine, J., Pattison, C. and Plowman, L. (1996). A Domain Aware Tool for Guiding Requirements Capture and Design. *Proceedings of OzCHI'96*, November 1996, New Zealand.

Mellish, C., Levine, J., Milne, R., Pattison, C., Bennington, A., Høhne, R., Middleton, S., Tyson, P., Walker, J., Plowman, L., Rogers, I. and Sharples, M. (1996). CORECT: The Collaborative Requirements Capture Tool. *Proceedings of CSCW Programme Symposium*, Ambleside, Cumbria, EPSRC/DTI, 66–78.

Levine, J. and Mellish, C. (1996). CORECT: Using Natural Language Generation as an Integral Part of a CSCW Tool for Requirements Capture. In Connolly, J. and Pemberton, L. (eds.) *Linguistic Concepts and Methods in CSCW*, Springer, 163–176.

Mellish, C., Reiter, E. and Levine, J. (1996). NLG Applications to Technical Documentation – A View Through IDAS. In Adorni, G. and Zock, M. (eds.) *Trends in Natural Language Generation: an Artificial Intelligence Perspective*, LNCS 1036, Springer, 368–382.

Reiter, E., Mellish, C. and Levine, J. (1995). Automatic Generation of Technical Documentation. *Applied Artificial Intelligence*, Volume 9, 259–287.

Levine, J. and Mellish, C. (1995). The IDAS User Trials: Quantitative Evaluation of an Applied Natural Language Generation System. *Proceedings of the Fifth European Workshop on Natural Language Generation*, Leiden, The Netherlands, 75–93.

Levine, J. and Mellish, C. (1994). CORECT: Combining CSCW with Natural Language Generation for Collaborative Requirements Capture. *Proceedings of the Seventh International Workshop on Natural Language Generation*, Kennebunkport, Maine, 236–239.

Levine, J. and Mellish, C. (1994). *CORECT: Combining CSCW with Natural Language Generation for Collaborative Requirements Capture*. DAI Research Paper 674, Department of Artificial Intelligence, University of Edinburgh.

Levine, J. (1993). Combining Plan-Based and Feature-Based Algorithms for the Generation of Cooperative Responses. In Bramer, M. and Macintosh, A. (eds.) *Research and Development in Expert Systems X (Proceedings of Expert Systems 93)*, BHR Group Ltd., 261–276.

Levine, J. (1992). *A Flexible Bidirectional Question-Answering System.* Ph.D. thesis, Computer Laboratory, University of Cambridge.

Reiter, E., Mellish, C. and Levine, J. (1992). Automatic Generation of On-Line Documentation in the IDAS Project. *Proceedings of the Third Conference on Applied Natural Language Processing*, Association for Computational Linguistics, 64–71.

Poynter, L., Levine, J., Walker, J., Reiter, E., Tyson, P. and Mellish, C. (1992). The Intelligent Documentation Advisory System. *Proceedings of the IEEE Colloquium on Industrial Applications of AI.*

Levine, J., Cawsey, A., Mellish, C., Poynter, L., Reiter, E., Tyson, P. and Walker, J. (1991). IDAS: Combining Hypertext and Natural Language Generation. *Proceedings of the Third European Workshop on Natural Language Generation*, Judenstein, Austria, 55–62.

Reiter, E., Levine, J. and Mellish, C. (1991). *Tailoring Plans to Users With Different Levels of Expertise.* DAI Research Paper 548, Department of Artificial Intelligence, University of Edinburgh.

Mellish, C., Poynter, L., Tyson, P., Walker, J. and Levine, J. (1990). *The Intelligent Documentation Advisory System.* DAI Research Paper 492, Department of Artificial Intelligence, University of Edinburgh.

Levine, J. (1990). PRAGMA – A Flexible Bidirectional Dialogue System. *Proceedings of the Eighth National Conference on Artificial Intelligence (AAAI–90)*, The MIT Press, 964–969.

Levine, J. and Fedder, L. (1989). *The Theory and Implementation of a Bidirectional Dialogue System.* Technical Report No. 182, Computer Laboratory, University of Cambridge.

Levine, J. (1989). Taking Generation Seriously in a Natural Language Question Answering System. *Proceedings of the Second European Workshop on Natural Language Generation*, Department of Artificial Intelligence, University of Edinburgh, 45–51.

Levine, J. (1987). *Generating Sentences from Logical Forms.* M.Phil. thesis, Department of Engineering, University of Cambridge.

Levine, J. (1986). *Explanations from a Rule-Based Expert System.* Dissertation for the Computer Science Tripos, Computer Laboratory, University of Cambridge.

Referees

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