Nikunj C. Oza

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EDUCATION

Ph.D. **University of California, Berkeley**
Computer Science, September 2001.
Thesis: **Online Ensemble Learning**

M.S. **University of California, Berkeley**
Computer Science, May 1998.
Thesis: **Probabilistic Models of Driver Behavior**

B.S. **Massachusetts Institute of Technology**
Mathematics with Computer Science, February 1994.

PUBLICATIONS

Nikunj C. Oza, Boosting with Averaged Weight Vectors, *Fourth International Workshop on Multiple Classifier Systems,* Surrey, UK. 2003.

Nikunj C. Oza, Kagan Tumer, Irem Y. Tumer, and Edward M. Huff, Classification of Aircraft Maneuvers for Fault Detection, *Fourth International Workshop on Multiple Classifier Systems,* Surrey, UK. 2003.

Kagan Tumer and Nikunj C. Oza, Input Decimated Ensembles, *Pattern Analysis and Applications,* 6(1):65-77, 2003.

Nikunj C. Oza, Online Ensemble Learning, Ph.D. thesis, University of California, Berkeley, 2001

Nikunj C. Oza and Stuart Russell, Experimental Comparisons of Online and Batch Versions of Bagging and Boosting, *The Seventh ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, San Francisco, California. 2001.

Nikunj C. Oza and Kagan Tumer, Input Decimation Ensembles: Decorrelation through Dimensionality Reduction, *Second International Workshop on Multiple Classifier Systems*, Cambridge, UK. 2001.

Nikunj C. Oza and Stuart Russell, Online Bagging and Boosting, *Eighth International Workshop on Artificial Intelligence and Statistics*, Key West, Florida. 2001.

Nikunj C. Oza, Online Ensemble Learning, *Proceedings of the 17th National Conference on Artificial Intelligence, Doctoral Consortium*, Austin, TX. 2000.

Nikunj C. Oza and Kagan Tumer, Dimensionality Reduction through Classifier Ensembles, Technical Report NASA-ARC-IC-1999-124.

Nikunj C. Oza, Probabilistic Models of Driver Behavior, *Spatial Cognition Conference*, Berkeley, CA. 1999.

Kagan Tumer and Nikunj C. Oza, Decimated Input Ensembles for Improved Generalization, *International Joint Conference on Neural Networks*, Washington, D.C. 1999, **Recipient: Best Presentation Award**.

Nikunj C. Oza, Probabilistic Models of Driver Behavior, M.S. report, University of California, Berkeley, 1998.

Alex Cuthbert, Christopher Stecker, Inna Aleksandrovsky, Sheryl Ehrlich, Nikunj Oza, and Paula Rogers, Instructional Effects on Spatial and Temporal Memory for Videotaped Events in a Large-scale Environment, *Nineteenth Annual Conference of the Cognitive Science Society*, Stanford, CA. 1997.

Jeffrey Forbes, Nikunj Oza, Ronald Parr, Stuart Russell, Feasibility Study of Fully Automated Vehicles Using Decision-Theoretic Control, California PATH Research Report UCB-ITS-PRR-97-18.

HONORS AND AWARDS

- NASA Incentive Award, 2003.
- Best Presentation Award, International Joint Conference on Neural Networks, Washington, D.C., 1999
- Schlumberger Foundation Fellowship, 1999
- NSF Graduate Research Training Program in Cognitive Science (Fellowship), 1996-1998
- California Fellowship in Microelectronics, 1994-1995
- MIT Class of 1950 Scholarship 1990-1993
- Life Membership, California Scholarship Federation, 1990

RESEARCH EXPERIENCE

Sep. 2001 to Present — *Research Scientist, **NASA Ames Research Center,** Moffett Field, California.* Worked on fault detection for aircraft. Currently working on ensemble learning methods (input decimation, bagging, boosting), applications of machine learning to satellite image understanding and water distribution system monitoring.

Jun. 1998—Aug. 1998 and Jun. 1999—Aug. 1999 — *Researcher, **NASA Ames Research Center**, Moffett Field, California.* Worked on input decimation--a new method of correlation reduction in ensemble classifiers that presents different features to different individual classifiers within the ensemble. Achieved classification results several standard deviations above the level of standard neural networks on several well-known datasets within the UCI Machine Learning Repository and numerous synthetic datasets.

Aug. 1996 — *Member, **NSF Graduate Research Training Program in Spatial***

to May 1998 ***Cognition, Institute for Cognitive Studies, University of California, Berkeley.***
Worked with Professor Stephen Palmer and students from several departments on the issue of separability of spatial and sequential mental representations as revealed by having subjects view a video depicting movement through a large-scale space and having them draw maps and make ordered lists of events occurring in the video.

Oct. 1995 to Aug. 2001 *Graduate Student Researcher,* ***Computer Science Division, University of California, Berkeley.***
Worked with Professor Stuart Russell on Bayesian Automated Taxi project.
Worked on learning probabilistic models of automobile driver behavior to allow an automated vehicle to predict the actions of nearby vehicles, thereby improving its own driving. Designed online versions of the bagging and boosting ensemble learning algorithms.

Jun. 1995 to Aug. 1995 *Researcher,* ***Information Technology Laboratory, General Electric Corporate Research and Development,*** *Schenectady, New York.*
Worked with Dr. Tomek Strzalkowski on the Natural Language Toolkit, a C++ library of tools to analyze documents. Specifically, designed and implemented module to classify sentences as imperative, declarative, fragments, or questions. Used this module to find procedures---sequences of imperative sentences---in maintenance manuals.

PROFESSIONAL ACTIVITIES

Reviewed articles for Journal of Machine Learning Research, International Journal for Pattern Recognition and Artificial Intelligence, SIAM Workshop on Data Mining and Machine Learning for Counter-Terrorism, and Experimental Program to Stimulate Competitive Research.

NASA Grant Writing Seminar, September 10-11, 2003.

NASA Project Management course, Jan 27, 2003—Feb 6, 2003.

Invited Presentation, “Machine Learning and Data Mining in System Health and Safety,” California Menay Institute, July 1, 2002.

TEACHING EXPERIENCE

Jan. 1995 to Dec. 1999 *Teaching Assistant,* ***University of California, Berkeley***
Structure and Interpretation of Computer Programs (Fall 1999), Artificial Intelligence (Fall 1995, Fall 1998), Computer Architecture (Spring 1995).

May 1999 to May 2000 *Member, Part-time Instructor Pool,* ***City College of San Francisco, California.***
Awarded membership in part-time pool, allowing members to choose each semester whether to teach and which courses to teach each semester.

Jan. 1998 to May 1998 — *Instructor,* ***City College of San Francisco, California.***
Designed and lectured intermediate C++ course.

Jan. 1993 to May 1993 — *Instructor,* ***MIT Educational Studies Program,*** *Cambridge, Massachusetts*
Designed and taught a course in Artificial Intelligence at MIT.

Sep. 1990 to Nov. 1991 — *Instructor,* ***MIT Educational Studies Program,*** *Cambridge, Massachusetts*
Taught courses on the Mathematics portion of the Scholastic Aptitude Test. (SAT).

OTHER PROFESSIONAL EXPERIENCE

Nov. 1996 to Nov. 1998 — *Independent Item Writer,* ***Educational Testing Service,*** *Oakland, California*
Independent author of questions for the new Graduate Record Examination (GRE) Mathematical Reasoning (MR) test.

Jan. 1994 to Aug. 1994 — *Engineer,* ***General Electric Nuclear Energy,*** *San Jose, California*
Evaluated several potential document management solutions for GE Nuclear Energy. Performed Database and Document Management System Administrator duties for Verity TOPIC databases (required C, UNIX, shell script, and MS-DOS batch programming). Established network remote access for Materials Services Site Representatives.

Jun. 1993 to Aug. 1993 — *Summer Intern,* ***General Electric Nuclear Energy,*** *San Jose, California*
Tested and wrote operator's manual for General Electric's ultrasonic Remote Inspection System and Motion Control System (a four-axis motor control system).

Jun. 1992 to Sep. 1992 — *Summer Intern,* ***General Electric Nuclear Energy,*** *San Jose, California*
Set up data acquisition and analysis system for fuel rod vibration data analysis using Viewdac software. Established it as part of standard operating procedure for vibration testing by performing required testing and writing appropriate documentation.

Apr. 1992 to May 1993 — *Chairman,* ***MIT Educational Studies Program,*** *Cambridge, Massachusetts*
Made all major executive decisions and oversaw the work of the directors of each educational program.

Jan. 1992 to Apr. 1992 — *Director,* ***SAT Preparation Program, MIT Educational Studies Program,*** *Cambridge, Massachusetts*
Directed program of 16 teachers and 150 students. Made all executive decisions specifically involving the SAT Preparation Program, presented reports on this program as a member of the Executive Board, and provided support to teachers.

May 1991 to Sep. 1991 — *Researcher, Undergraduate Research Opportunity Program,* ***Massachusetts Institute of Technology,*** *Cambridge, Massachusetts*
Designed and wrote a Survival Analysis software package for Professor Michael Rappa of the Sloan School of Management at MIT. Wrote the package in the C programming language for the Apple Macintosh series computers. Designed and

implemented the user interface, algorithms, and code to perform survival data analysis.

PROFESSIONAL MEMBERSHIPS

American Association for Artificial Intelligence (AAAI)
Association for Computing Machinery (ACM)