

An Analysis of Publication Venues for Automatic Differentiation Research

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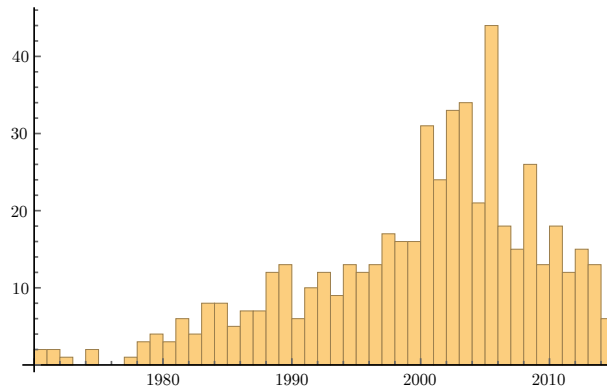
22 September 2014

We present the results of our analysis of publication venues for papers on automatic differentiation (AD), covering academic journals and conference proceedings.

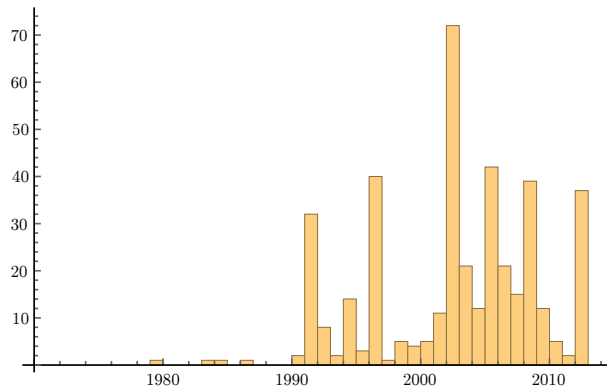
Our data are collected from the *AD publications database* maintained by the autodiff.org community website (<http://www.autodiff.org/>). The database is purpose-built for the AD field and is expanding via submissions by AD researchers. Therefore, it provides a relatively noise-free list of publications relating to the field. However, it does include noise in the form of variant spellings of journal and conference names. We handle this by manually correcting and merging these variants under the official names of corresponding venues. We share the raw data we get after these corrections, at the end of this report.

In the final data, we have 535 journal papers published between 1970–2014 and 410 conference papers published between 1979–2012.

Figure 1 shows the distribution of publication years of AD-related papers. Figures 2 and 3 give the ranking of journals and conferences by the number of AD-related published papers. For keeping the size of these ranking figures manageable, we only include venues with 2 or more publications.



(a)



(b)

Fig. 1: Distribution of publication years of AD-related papers. (a) Journals; (b) Conference proceedings.

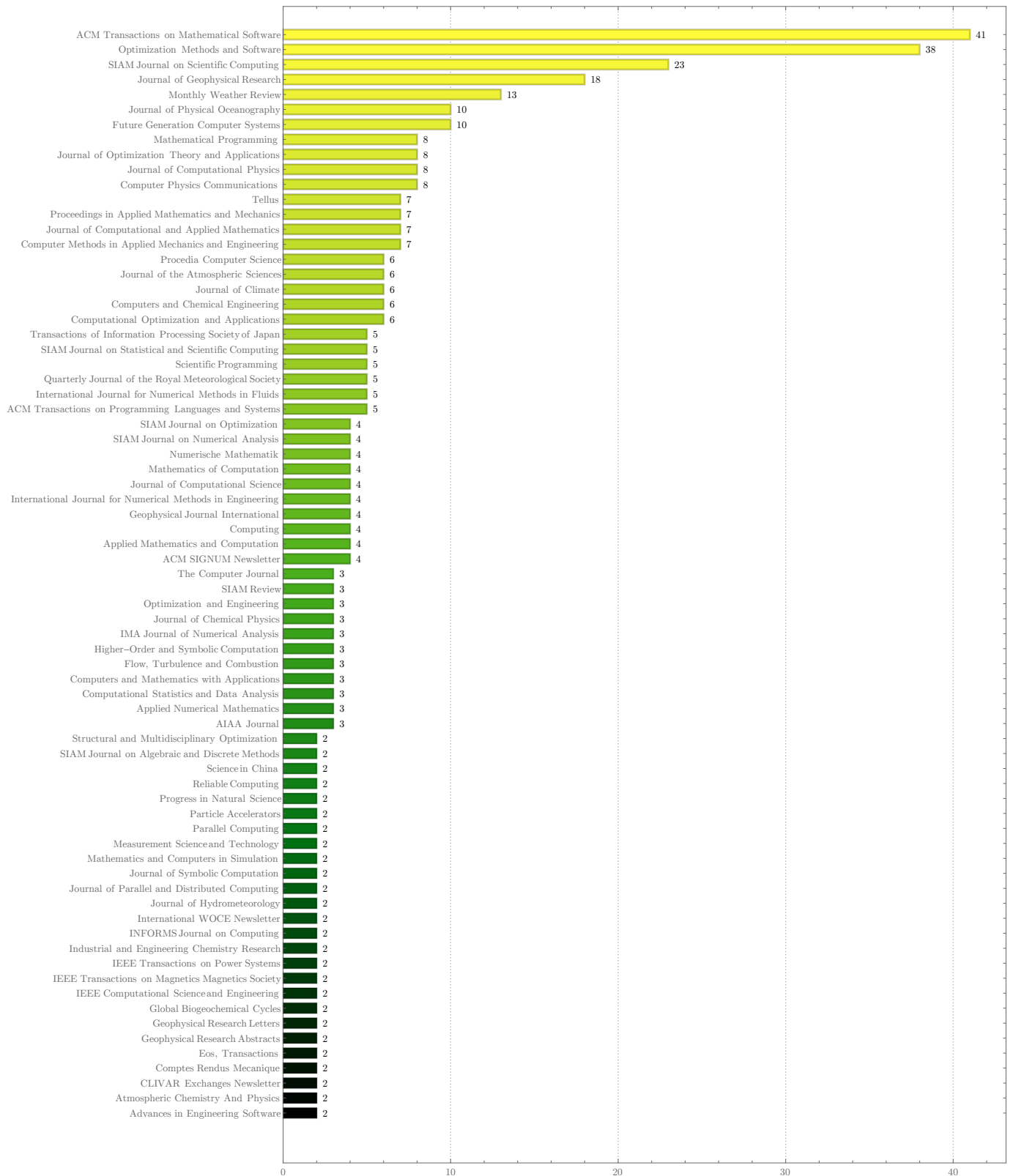


Fig. 2: Ranking of journals by the number of AD-related published papers. Journals with less than 2 papers are not shown.

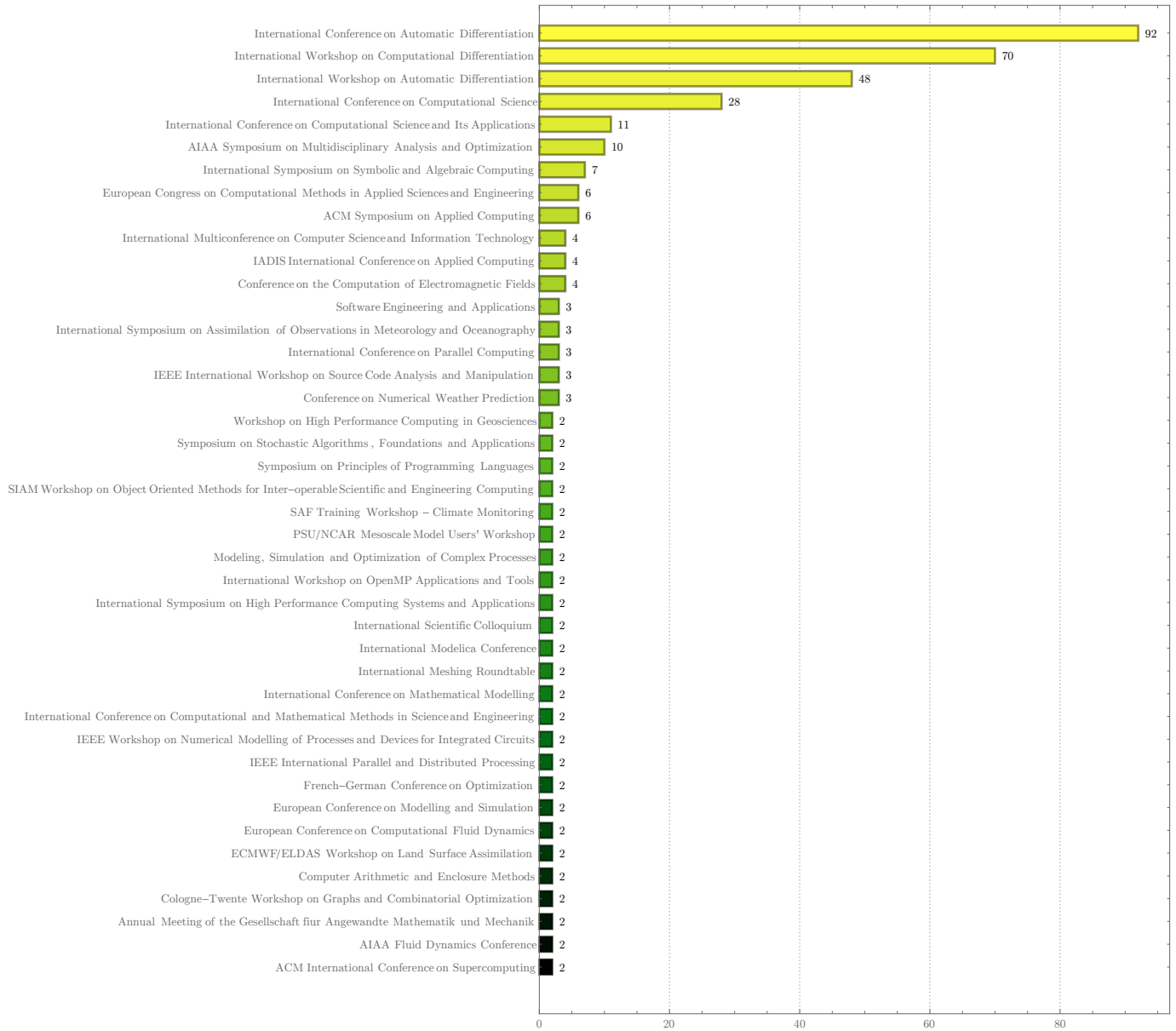


Fig. 3: Ranking of conferences by the number of AD-related published papers. Proceedings with less than 2 papers are not shown.

Cleaned up raw data for journal papers:

ACM Computing Surveys 1994, 1
ACM SIGNUM Newsletter 1987, 1; 1988, 1; 1989, 1; 1995, 1
ACM Transactions on Mathematical Software 1980, 2; 1981, 2; 1982, 2; 1984, 2; 1985, 1; 1992, 1; 1995, 2; 1996, 1; 1998, 1; 1999, 1; 2000, 5; 2002, 1; 2003, 2; 2004, 1; 2005, 2; 2006, 1; 2007, 1; 2008, 4; 2010, 1; 2012, 2; 2013, 4; 2014, 2
ACM Transactions on Programming Languages and Systems 1983, 1; 1989, 1; 1991, 1; 1993, 1; 2008, 1
Acta Crystallographica Section D 2004, 1
Acta Informatica 1972, 1
Acta Oecologica 2004, 1
Advances in Engineering Software 2000, 1; 2003, 1
Advances in Space Research 2000, 1
Advances in Water Resources 2006, 1
Aerosol Science And Technology 2005, 1
AIAA Journal 1997, 1; 2005, 1; 2008, 1
Annales Geophysicae 1996, 1
Annals of Biomedical Engineering 2010, 1
Applied Mathematics and Computation 1987, 2; 1990, 1; 2009, 1
Applied Numerical Mathematics 1992, 1; 1996, 1; 1997, 1
Atmospheric Chemistry And Physics 2003, 1; 2005, 1
Atmospheric Environment 1997, 1
Atmospheric Measurement Techniques 2011, 1
Automatisierungstechnik 2000, 1
Biometrics 1983, 1
BIT 2005, 1
Bulletin of the American Meteorological Society 1997, 1
BYTE 1986, 1
Canadian Journal of Fisheries and Aquatic Sciences 2001, 1
Chemical Engineering Science 2008, 1
Climatic Change 1997, 1
CLIVAR Exchanges Newsletter 2000, 2
CNLS Research Highlights 1998, 1
College Mathematics Journal 1989, 1
Communications in Nonlinear Science and Numerical Simulation 2013, 1
Complex Variables and Elliptic Equations 2009, 1
Comptes Rendus Mecanique 2008, 2
Computational Complexity 1997, 1
Computational Mathematics and Mathematical Physics 1997, 1
Computational Optimization and Applications 1995, 2; 1997, 1; 1998, 1; 2003, 1; 2004, 1
Computational Statistics and Data Analysis 1988, 1; 2006, 1; 2011, 1
Computer Graphics Forum 2013, 1
Computer Journal 1983, 1
Computer Methods in Applied Mechanics and Engineering 1994, 1; 1998, 1; 2005, 1; 2008, 1; 2009, 1; 2010, 1; 2011, 1
Computer Physics Communications 2000, 1; 2002, 1; 2005, 1; 2006, 1; 2007, 1; 2010, 2; 2013, 1
Computer Science and Information Systems 2007, 1
Computers and Chemical Engineering 1988, 1; 1990, 1; 1995, 1; 1998, 1; 2009, 1; 2013, 1
Computers and Fluids 2006, 1
Computers and Geosciences 2002, 1
Computers and Mathematics with Applications 1985, 1; 1986, 1; 1994, 1
Computers and Structures 2010, 1
Computers in Physics 1996, 1
Computing and Visualization in Science 2001, 1
Computing Systems in Engineering 1992, 1
Computing 1979, 1; 1986, 1; 1996, 1; 2012, 1
Current Science 2000, 1
Deep Sea Research Part I: Oceanographic Research Papers 2004, 1
Deep Sea Research Part II: Topical Studies in Oceanography 2011, 1
Discrete and Continuous Dynamical Systems Supplements 2011, 1
Discrete Applied Mathematics 2008, 1
Discussiones Mathematicae, Differential Inclusions, Control and Optimization 2007, 1
Dynamical Systems and Differential Equations, AIMS 2013, 1
Earth and Planetary Science Letters 2007, 1
Econometrics Journal 2003, 1
Electrical Engineering in Japan 2005, 1
Electronic Notes in Theoretical Computer Science 2007, 1
Electronic Transactions on Numerical Analysis 2005, 1
Environmental and Ecological Statistics 2008, 1
Environmental Modelling and Software 2000, 1
Eos, Transactions 2002, 2
Finite Elements in Analysis and Design 1993, 1
Flow, Turbulence and Combustion 2000, 2; 2001, 1
Future Generation Computer Systems 2005, 10
GACM Report 2011, 1
General Relativity and Gravitation 2005, 1
Geophysical Journal International 2005, 1; 2006, 1; 2007, 2
Geophysical Research Abstracts 2003, 2
Geophysical Research Letters 2003, 1; 2006, 1
Geoscience and Remote Sensing Letters 2007, 1
Geoscientific Instrumentation, Methods and Data Systems 2013, 1
Global Biogeochemical Cycles 2002, 1; 2005, 1
Higher-Order and Symbolic Computation 2001, 1; 2008, 2
IEEE Computational Science and Engineering 1996, 1; 1998, 1
IEEE Transactions on Automatic Control 1994, 1
IEEE Transactions on Antennas and Propagation 2009, 1
IEEE Transactions on Electron Devices 1988, 1
IEEE Transactions on Geoscience and Remote Sensing 2008, 1
IEEE Transactions on Magnetics Magnetics Society 2010, 1; 2011, 1
IEEE Transactions on Power Systems 1997, 1; 1999, 1
IEICE Transactions 1991, 1
IMA Journal of Numerical Analysis 1986, 1; 1991, 1; 1992, 1
IMACS Annals of Computing and Applied Mathematics 1992, 1
IMACS Transactions on Scientific Computing 1989, 1
Industrial and Engineering Chemistry Research 1989, 1; 2004, 1
Informatik-Spektrum 2008, 1
INFORMS Journal on Computing 1997, 1; 2009, 1
International Journal for Numerical Methods in Engineering 1998, 1; 2003, 2; 2006, 1
International Journal for Numerical Methods in Fluids 2002, 1; 2005, 1; 2009, 1; 2010, 1; 2011, 1
International Journal of Computational Science and Engineering 2014, 1
International Journal of High Performance Computing and Networking 1999, 1
International Journal of High Speed Computing 2004, 1
International Journal of Numerical Methods in Fluids 2005, 1
International Journal of Radiation Oncology Biology Physics 1993, 1
International Journal on Control 1988, 1
International WOCE Newsletter 1999, 2
Japan Journal of Applied Mathematics 1984, 1
Journal of Applied Meteorology 2002, 1
Journal of Atmospheric and Oceanic Technology 2003, 1
Journal of Atmospheric and Solar-Terrestrial Physics 2004, 1
Journal of Atmospheric Chemistry 2005, 1
Journal of Chemical Physics 1992, 1; 2001, 1; 2005, 1
Journal of Climate 1997, 1; 2001, 1; 2002, 2; 2003, 2

Journal of Computational Acoustics 2004, 1
Journal of Computational and Applied Mathematics 1988, 1; 1991, 1; 1995, 1; 2000, 1; 2002, 1; 2008, 1; 2009, 1
Journal of Computational and Graphical Statistics 1995, 1
Journal of Computational Physics 1981, 1; 1994, 1; 1996, 2; 2000, 2; 2004, 1; 2005, 1; 2010, 1; 2013, 1; 2014, 2
Journal of Econometrics 1994, 1
Journal of Economic Dynamics and Control 1990, 1
Journal of Fluids Engineering 2007, 1
Journal of Geophysical Research 1998, 1; 1999, 3; 2000, 1; 2001, 3; 2002, 3; 2003, 2; 2004, 4; 2005, 1
Journal of Global Optimization 1995, 1
Journal of Graphics, GPU, and Game Tools 2004, 1
Journal of Hydrometeorology 2001, 1; 2003, 1
Journal of Information Processing 1991, 1
Journal of Marine Systems 2001, 1
Journal of Mathematical Analysis and Applications 1983, 1
Journal of Mathematical Physics 1981, 1
Journal of Object Oriented Programming 1990, 1
Journal of Oceanography 2006, 1
Journal of Optimization Theory and Applications 1979, 1; 1983, 1; 1984, 1; 1988, 1; 1989, 2; 2000, 1; 2004, 1
Journal of Parallel and Distributed Computing 1997, 1; 2008, 1
Journal of Physical Oceanography 2002, 4; 2003, 2; 2004, 1; 2005, 2; 2006, 1
Journal of Quantitative Spectroscopy and Radiative Transfer 2014, 1
Journal of Sound and Vibration 1995, 1
Journal of Symbolic Computation 1986, 1; 1994, 1
Journal of Systems and Software 2006, 1
Journal of the Atmospheric Sciences 1982, 1; 1996, 1; 1999, 1; 2003, 2; 2006, 1
Journal of the Institute of Mathematics and Applications 1974, 1
Journal of Volcanology and Geothermal Research 2008, 1
Journal of Water Resources Planning and Management 1999, 1
Journal on Numerical Methods and Computer Applications 2003, 1
Linear Algebra and Its Applications 1991, 1
Magnetics Transactions on 2005, 1
MATEKON 1985, 1
Matematicheskoe Modelirovanie 1989, 1
Mathematica Numerica Sinica 2009, 1
Mathematical and Computer Modelling 2003, 1
Mathematical Geology 2005, 1
Mathematical Modelling and Numerical Analysis 2002, 1
Mathematical Proceedings of the Cambridge Philosophical Society 1978, 1
Mathematical Programming 1978, 1984, 1; 1988, 1; 2002, 1; 2003, 1; 2004, 1; 2006, 1; 2008, 1
Mathematics and Computers in Simulation 2010, 1; 2011, 1
Mathematics Magazine 1986, 1
Mathematics of Computation 1984, 1; 1999, 1; 2000, 1; 2005, 1
Measurement Science and Technology 2002, 1; 2003, 1
Meteorology And Atmospheric Physics 2004, 1
Methoden Und Verfahren Der Mathematischen Physik 1971, 1
Monthly Weather Review 1992, 2; 1997, 1; 1999, 1; 2000, 1; 2001, 2; 2002, 4; 2003, 1; 2005, 1
Neural Computation 1994, 1
Nonlinear Optimization 1981, 1
Numerical Algorithms 1998, 1
Numerische Mathematik 1977, 1; 1982, 1; 1993, 1; 1994, 1
Ocean Modeling Journal 2006, 1
Optimization and Engineering 2001, 1; 2005, 1; 2008, 1
Optimization Methods and Software 1991, 1; 1992, 2; 1993, 2; 1994, 2; 1996, 1; 1997, 1; 1998, 4; 1999, 2; 2000, 2; 2001, 2; 2002, 2; 2003, 1; 2009, 1; 2010, 1; 2011, 1;
2012, 12; 2013, 1
Optimization 2001, 1
ORSA Journal on Computing 1993, 1
Parallel Computing 1990, 1; 2001, 1
Particle Accelerators 1989, 2
Physica D. 2005, 1
Physics and Chemistry of the Earth 1996, 1
Physics of Fluids 2005, 1
Policy Analysis and Information Systems 1979, 1
Procedia Computer Science 2010, 4; 2011, 1; 2013, 1
Proceedings in Applied Mathematics and Mechanics 2003, 3; 2007, 3; 2010, 1
Progress in Natural Science 2002, 1; 2009, 1
Quarterly Journal of the Royal Meteorological Society 1987, 2; 2001, 1; 2002, 1; 2003, 1
Reliable Computing 1998, 1; 2007, 1
Remote Sensing of the Environment 2006, 1
Science in China 2004, 1; 2009, 1
Science 2001, 1
Scientific Programming 1992, 1; 2001, 1; 2003, 1; 2006, 1; 2008, 1
SIAG/OPT Views-and-News 2000, 1
SIAM Journal of Numerical Analysis 1978, 1
SIAM Journal on Algebraic and Discrete Methods 1983, 1; 1986, 1
SIAM Journal on Computing 1988, 1
SIAM Journal on Discrete Mathematics 1981, 1
SIAM Journal on Matrix Analysis and Applications 1996, 1
SIAM Journal on Numerical Analysis 1974, 1; 1979, 1; 1983, 1; 1997, 1
SIAM Journal on Optimization 1991, 1; 2002, 2; 2005, 1
SIAM Journal on Scientific Computing 1994, 2; 1995, 1; 1997, 1; 1998, 2; 1999, 2; 2000, 3; 2001, 1; 2002, 1; 2003, 1; 2005, 3; 2006, 1; 2007, 1; 2008, 3; 2009, 1
SIAM Journal on Statistical and Scientific Computing 1980, 1; 1987, 1; 1988, 1; 1992, 1; 1993, 1
SIAM News 1991, 1
SIAM Review 1988, 1; 2005, 1; 2010, 1
SIGACT News 1985, 1
Simulation Modelling Practice and Theory 2004, 1
Software--Practice and Experience 1997, 1
Structural and Multidisciplinary Optimization 1995, 1; 2000, 1
Studia Geophysica et Geodaetica 2001, 1
Tellus 1985, 1; 1990, 1; 1993, 1; 1996, 1; 2000, 2; 2003, 1
The American Statistician 1984, 1
The Computer Journal 1970, 2; 2008, 1
The Journal of Chemical Physics 2001, 1
The Review of Economics and Statistics 1984, 1
Theoretical Computer Science 1983, 1
Transactions of Information Processing Society of Japan 1987, 1; 1988, 1; 1989, 3
Transactions of the American Nuclear Society 2010, 1
Transactions on Graphics 2011, 1
Weather and Forecasting 2002, 1
Wissenschaftliche Zeitschrift der Technischen Hochschule fuer Chemie, Leuna-Merseburg 1971, 1
WSEAS Transactions on Circuits and Systems 2005, 1
WSEAS Transactions on Mathematics 2006, 1
Yugoslav Journal of Operations Research 1991, 1

Cleaned up raw data for conference papers:

Aachen Symposium on Signal Theory 2001, 1
ACM International Conference on Supercomputing 2001, 2
ACM SIGPLAN International Conference on Functional Programming 1998, 1
ACM SIGPLAN Workshop on Partial Evaluation and Semantics-Based Program Manipulation 2002, 1
ACM Symposium on Applied Computing 2002, 1; 2003, 3; 2004, 1; 2009, 1
ACM Symposium on Parallel Algorithms and Architectures 1999, 1
ACM Symposium on the Theory of Computing 1983, 1
Advances in Reactor Physics 2012, 1
AIAA Aerospace Sciences Meeting and Exhibit 2001, 1
AIAA Computational Fluid Dynamics Conference 1993, 1
AIAA Fluid Dynamics Conference 1994, 2
AIAA Symposium on Multidisciplinary Analysis and Optimization 1992, 2; 1994, 7; 1998, 1; 2012, 1
Annual Meeting of the Gesellschaft für Angewandte Mathematik und Mechanik 2002, 2
Array Conference 1986, 1
Colloque Africain sur la Recherche en Informatique 2002, 1
Cologne-Twente Workshop on Graphs and Combinatorial Optimization 2009, 2
Computer Arithmetic and Enclosure Methods 1992, 2
Computers and Information in Engineering Conference 2007, 1
Conference on Atmospheric and Oceanic Fluid Dynamics 2003, 1
Conference on Engineering Applications and Computational Algorithms 2003, 1
Conference on Numerical Weather Prediction 1998, 1; 2001, 2
Conference on Scientific Computing 2000, 1
Conference on the Computation of Electromagnetic Fields 2007, 2; 2009, 2
Conference on Weather Analysis and Forecasting 2005, 1
Dagstuhl Seminar on Combinatorial Scientific Computing 2009, 1
ECMWF/ELDAS Workshop on Land Surface Assimilation 2005, 2
EURROMECH Nonlinear Dynamics Conference 2005, 1
European Conference on Computational Fluid Dynamics 2006, 2
European Conference on Modelling and Simulation 2006, 2
European Congress on Computational Methods in Applied Sciences and Engineering 1996, 1
European Congress on Computational Methods in Applied Sciences and Engineering 2004, 5
European Simulation Multiconference 2004, 1
EUROSIM Congress on Modelling and Simulation 2001, 1
French-German Conference on Optimization 1994, 2
High Performance Computing Symposium 1995, 1
IADIS International Conference on Applied Computing 2007, 4
IASTED International Conference on Modelling, Identification, and Control 2002, 1
IEEE Conference on Decision and Control 2012, 1
IEEE International Conference on Cluster Computing 2010, 1
IEEE International Conference on Computer Design 1992, 1
IEEE International Parallel and Distributed Processing 1998, 2
IEEE International Workshop on Parallel and Distributed Scientific and Engineering Computing 2009, 1
IEEE International Workshop on Source Code Analysis and Manipulation 2002, 1; 2004, 1; 2006, 1
IEEE Radar Conference 2010, 1
IEEE Workshop on Numerical Modelling of Processes and Devices for Integrated Circuits 1992, 2
International Carbon Dioxide Conference 2001, 1
International Conference of Modeling and Simulation 2008, 1
International Conference on Architecture of Computing Systems 2002, 1
International Conference on Automatic Differentiation 2005, 30; 2008, 31; 2012, 31
International Conference on Computational and Mathematical Methods in Science and Engineering 2010, 2
International Conference on Computational Science 2001, 1; 2002, 10; 2003, 2; 2004, 1; 2005, 1; 2006, 11; 2008, 1
International Conference on Computational Science and Its Applications 2003, 8; 2006, 2; 2009, 1
International Conference on Fuzzy Systems and Knowledge Discovery 2009, 1
International Conference on Heat and Mass Transfer 2009, 1
International Conference on Mathematical Modelling 2003, 1; 2012, 1
International Conference on Metal Forming 2012, 1
International Conference on Parallel and Distributed Processing Techniques and Applications 2001, 1
International Conference on Parallel Computing 2007, 1; 2008, 2
International Conference on Solid-State Sensors, Actuators and Microsystems 2005, 1
International Conference on Underwater System Technology 2008, 1
International Congress on Mathematical Software 2006, 1
International Euro-Par Conference 2000, 1
International Federation for Information Processing Conference 1984, 1
International Meshing Roundtable 2002, 1; 2004, 1
International Modelica Conference 2008, 1; 2012, 1
International MultiConference of Engineers and Computer Scientists 2009, 1
International MultiConference on Computer Science and Information Technology 2007, 3; 2009, 1
International Scientific Colloquium 2000, 1; 2011, 1
International Symposium on Assimilation of Observations in Meteorology and Oceanography 1990, 2; 1995, 1
International Symposium on High Performance Computing Systems and Applications 2002, 1; 2003, 1
International Symposium on Scientific Computing, Computer Arithmetic and Validated Numerics 1996, 1
International Symposium on Symbolic and Algebraic Computing 1992, 1; 1993, 1; 1997, 1; 1999, 1; 2002, 1; 2003, 1; 2007, 1
International Symposium on Symbolic and Numeric Algorithms for Scientific Computing 2004, 1
International Workshop on Aircraft Systems Technologies 2007, 1
International Workshop on Automatic Differentiation 2002, 48
International Workshop on Computational Differentiation 1991, 32; 1996, 38
International Workshop on Equation-Based Object-Oriented Modeling Languages and Tools 2011, 1
International Workshop on Implementation and Application of Functional Languages 2005, 1
International Workshop on OpenMP Applications and Tools 2005, 2
Macsyma User's Conference 1979, 1
Modeling, Simulation and Optimization of Complex Processes 2005, 1; 2008, 1
Modelling, Identification, and Control 2003, 1
North American Power Symposium 1994, 1
PSU/NCAR Mesoscale Model Users' Workshop 2002, 2
Python for Scientific Computing Conference 2010, 1
SAF Training Workshop - Climate Monitoring 2000, 2
Scientific Discovery through Advanced Computing Program 2005, 1
SIAM Workshop on Object Oriented Methods for Inter-operable Scientific and Engineering Computing 1999, 2
Software Engineering and Applications 2002, 1; 2003, 1; 2004, 1
Symposium on Principles of Programming Languages 2007, 2
Symposium on Simulation Techniques 2005, 1
Symposium on Stochastic Algorithms, Foundations and Applications 2001, 1; 2003, 1
Workshop on Applied Parallel Computing in Physics, Chemistry and Engineering Science 1996, 1
Workshop on Automatic Data Layout and Performance Prediction 1995, 1
Workshop on High Performance Computing in Geosciences 1994, 2
Workshop on Parallel Systems and Algorithms 2008, 1
Workshop on Symbolic and Numeric Computing 1994, 1
World Congress on Intelligent Control and Automation 2006, 1