
1.0 Biographical Sketches of PI and Participating Faculty

ELIAS N. HOUSTIS, Professor, Department of Computer Sciences, Purdue University

E.N. Houstis is a Professor of Computer Science and Director Computational Science Engineering Program. He has served as acting and associate Head of the Department of Computer Sciences for several years. Houstis is in the editorial board of Neural, Parallel and Scientific Computational and HPC Users web-based Journals and a member of the IFIP-WG 2.5 Working Group in Numerical Software. Houstis's current research interests are in the areas of problem solving environments (PSEs), parallel computation, performance evaluation and modeling, and computational intelligence. He and John Rice are the principal designers of several domain specific PSEs (i.e., Parallel ELLPACK, PDELab) and numerous performance evaluation studies of PDE software and parallel architectures. He is leading the parallel ELLPACK group which is developing infrastructure and implementing methodologies for reusing "legacy" PDE software on a variety of physical and virtual parallel machines and designing a Web Parallel ELLPACK server. Houstis has been involved in the designing of a knowledge based framework (known as PYTHIA) to support the selection of algorithm and machine pairs for a given class of PDE problems based on performance knowledge. He has published several books and over 120 technical articles.

Education

1974 Ph.D., Mathematics, Purdue University

Professional Experience

1974-75 Post Doctoral Fellow, Purdue University (Civil Mechanical Engineering)

1975-78 Assistant Professor, Purdue University

1978-82 Assistant/Associate Professor, University of South Carolina

1980-88 Chair in Applied Mathematics, University of Thessaloniki, Greece

1985-present Professor, Purdue University

1987-88, 1993-94 Acting Head

1989-93 Associate Head

1994-present Director of Computational Science & Engineering Program

Recent Publications

1. S. Weerawarana, E.N. Houstis, J.R. Rice, A.C. Catlin, C.L. Crabill, C.C. Chui and S. Markus, PDELab: An object-oriented framework for building problem solving environments for PDE based applications, Proceedings of 2nd Object-Oriented Numerics Conf., (A.Vermeulen, ed.), RogueWave Software, Corvallis, OR (1994), 79-92.
2. N. Chrisochoides, E.N. Houstis, and J.R. Rice, Mapping algorithms and software environment for data parallel PDE iterative solvers, Journal of Parallel and Distributed Computing, 21, (1994), 75-95.
3. E.N. Houstis, A. Hadjidimos, S.B. Kim, and J.R. Rice, The performance of parallel stationary iterative methods for distributed memory machines, Proc. Intel Supercomputer Users Group (D. Marinescu and R. Frost, eds) (1994), 169-173.
4. S.B. Kim, S. Markus, N.E. Houstis, E.N. Houstis, A.C. Catlin, and P. Wu, Parallel methodologies for legacy scientific software, in Proc. of the Intel Supercomputer Users Group, pp.211-245, 1995.
5. S. Markus, S.B. Kim, K. Pantazopoulos, A.L. Ocken, E.N. Houstis, P. Wu, and S. Weerawarana, Performance evaluation of MPI implementations using the Parallel ELLPACK PSE, in Proc. of the Second MPI Developers Conference, IEEE Society Press, 1996.
6. P. Wu and E.N. Houstis, Parallel adaptive mesh generation and decomposition, Engineering with Computers, 12, (1996), 155-167.
7. P. Wu and E.N. Houstis, EPPD: A parallel electronic prototyping system for physical objects, Journal of Parallel and Distributed Computing, 42, (1997), 157-172.
8. E.N. Houstis, J.R. Rice, S. Weerawarana, A.C. Catlin, P. Papachiou, K.-Y. Wang, and M. Gastatzes, Parallel ELLPACK: A problem solving environment for PDE based applications on multicomputer platforms, ACM = Trans. Math. Software, (1998), to appear.
9. Markus, S., S. Weerawarana, E.N. Houstis, and J.R. Rice, Scientific = computing via the web: The net Pellpack PSE server (with), IEEE Comp. Sci. & Engr. 4 (No. 3), (1997), 43-51.
10. E.N. Houstis, S. Gallopoulos, R. Bramley, and J.R. Rice, Problem solving environments for computational science, IEEE Comp. Sci. & Engr. 4 (No. 3), (1997), 18-21.

THOMAS J. DOWNAR, Professor, School of Nuclear Engineering, Purdue University

T.J Downar is a Professor of Nuclear Engineering. His fields of specialization are Computational Methods, Reactor Physics, High Performance Computing. Downar's current research funding are from Nuclear Regulatory Commission for Parallel Computing, Sciencetech Inc. for Spatial Reactor Kinetics, and Electric Power Research Inst. for Computational Fluid Dynamics. Downar has done consultation for Nuclear Regulatory Commission Sciencetech, Inc., Electric Power Research Institute Commonwealth Edison Co. Idaho, and National Engineering Laboratory Argonne National Laboratory. Downar has published a book: Driscoll, M., Downar, T., and Pilot, E., "The Linear Reactivity Model for Nuclear Fuel Management," American Nuclear Society, 1990.

Education

1984: Ph.D. Massachusetts Institute of Technology Nuclear Engineering

1975: M.S. Massachusetts Institute of Technology Nuclear Engineering

1974: B. S. U.S. Military Academy, West Point, Applied Science and Engineering

Professional Experience

1998-present Professor, School of Nuclear Engineering, Purdue University

1991-1998 Associate Professor, School of Nuclear Engineering, Purdue University

1984-91 Assistant Professor, School of Nuclear Engineering, Purdue University

1984 Instructor, Department of Nuclear Engineering, Massachusetts Institute of Technology

1979-1981 Assistant Professor of Physics, U.S. Military Academy, West Point, NY

Recent Publications

1. "Parallel and Serial Applications of the RETRAN-03 Power Plant Simulation Code Using Domain Decomposition and Krylov Subspace Methods," T. Downar, J.Y. Wu, J. Steill, and R. Janardhan, Nuclear Technology, Vol. 117, February, 1997.
2. "An Incomplete Domain Decomposition Preconditioning Method for Nonlinear Nodal Kinetics Calculations," H. Joo and T. Downar, Nucl. Sci. Eng., July, 1996.
3. "A Weighted Distorted Born Iterative Method for Imaging in a Diffuse Medium with Modulated Low-Coherence Light," J. Ye, K. Webb, T. Downar, R. Millane, J. Opt. Soc. Am A., May, 1997.
4. "The Application of SIMD, MIMD, and Mixed-Mode Parallel Computing to Nuclear Reactor Simulation," R. Janardhan, T. Downar, J. So, H.J. Siegel, Journal of Parallel Computing, February, 1998.
5. "Optimization of PWR Shuffling by Simulated Annealing with Heuristics," J. Stevens, K. Smith, K. Rempe, T. Downar, Nucl. Sci. Eng., Oct., 1994.
6. "Numerical Convergence of Equivalence Theory in the Nodal Expansion Method," M. Zika and T.J. Downar, Nucl. Sci. Eng., Nov., 1993.
7. "Sensitivity Theory for the Closed Nuclear Fuel Cycle," H. Choi and T.J. Downar, Nucl. Sci. Eng., Jun., 1992.
8. "A Nested FGMRES Method for Parallel Calculation of Nuclear Reactor Transients," R. Janardhan and T. Downar, Journal of Scientific Computing, Vol.13, No.1, 65-93, 1998.
9. "Stabilization Techniques for the Nonlinear Analytic Nodal Method," H. Joo, G. Jiang, T. Downar, Nuclear Science and Eng., (to be published) Sep., 1998.
10. "Analysis of the Reactivity During a PWR Main Steam Line Break Transient," G. Gose, T. Downar, and K. Ott, Nuclear Technology., (to be published) Aug. 1998.
11. "The Significance of the Inhomogeneous Wave Equation in Frequency-Resolved Optical Diffusion Imaging," Optics Letter, J. Ye, K. Webb, T. Downar, R. Millane, Submitted for Publication, March, 1998.

HISAO NAKANIHI, Professor, Department of Physics, Purdue University

H. Nakanishi is a Professor of Physics. Nakanishi is the recipient of Gordon Bell Prize (with V. Rego and V. Sunderam), for application of parallel processing to scientific and engineering problems, IEEE, 1992. He has been to Germany and France as visiting Professor.

Education

B.Sc. (Brown, 1974)
M.A. (Harvard, 1976)
Ph.D. (Harvard, 1980)

Professional Experience

1980-1982 Research Associate (with Prof. M. E. Fisher), Cornell University
1982-1983 Assistant Research Physicist, ITP, Univ. of Calif., Santa Barbara
1984-1989 Assistant Professor, Purdue University
1989-1995 Associate Professor, Purdue University
1986-1987 Visiting Professor, Physique de la Matière Condensée, Collège de France
1989-1990 Visiting Professor, Theo. Physics Inst., Univ. of Minnesota
1992-1993 Visiting Professor, HLRZ, KFA-J, Jülich, W-5170 Germany

Recent Publications

1. Multicriticality of wetting, prewetting, and surface transitions (H. Nakanishi and M.E. Fisher), Phys. Rev. Lett. 49, 1565-1568 (1982).
2. Self-avoiding Lévy flight: a numerical test of the ϵ expansion (J. W. Halley and H. Nakanishi), Phys. Rev. Lett. 55, 551-554 (1985).
3. Self-avoiding walks on randomly diluted lattice (S. B. Lee and H. Nakanishi), Phys. Rev. Lett. 61, 2022-2025 (1988).
4. Onset of excluded-volume effect for the statistics of stiff chains (J. Moon and H. Nakanishi), Phys. Rev. A 44, 6427-6442 (1991).
5. Anomalous Diffusion in Disordered Clusters in On Clusters and Clustering: From Atoms to Fractals, ed. P.J. Reynolds, North-Holland (1993).
6. Random and self-avoiding walks in disordered media in Annual Reviews of Computational Physics, ed. D. Stauffer, World Scientific (1994).
7. Markov chain analysis of random walks in disordered media (S. Mukherjee, H. Nakanishi, and N. H. Fuchs), Phys. Rev. E 49, 5032--5045 (1994).
8. On the Effectiveness of Superconcurrent Computations on Heterogeneous Networks (H. Nakanishi, V. Rego and V. Sunderam), J. Par. Dist. Computing 24, 177 (1995).
9. Effect of boundary tethering on vibrational modes of fractals (H. Nakanishi and S. Mukherjee), Fractals, 4, 273-278 (1996); reprinted in Future of Fractals, ed. S. Miyazima, World Scientific (1997).
10. CHIP: Computerized Homework in Physics (V. K. Saxena, H. Nakanishi, D. Elmore, E. Shibata, and D. Bortoletto) in Using Technology to Enhance Learning: How Does It Change What Faculty Do?, ed. Indiana Partnership for Statewide Education, published by Indiana Higher Education Telecommunication System, in press (1998).

RUDOLPH EIGENMANN, Associate Professor, School of Electrical and Computer Engineering, Purdue University

R.Eigenmann is an Associate Professor of Electrical and Computer Engineering. His research interests include Compilers for parallel machines, Tools and Environments for high-performance computer applications, Characterization of computational applications, Performance evaluation and benchmarking, Computer architecture. Eigenmann has research grants from ARPA and NSF, Industrial equipment grant from Sun Microsystems, and Industrial testing agreement with the Standard Performance Evaluation Corporation. Eigenmann is the recipient of NSF CAREER Award 1997.

Education

1988, Ph.D., Computer Science / Electrical Engineering, ETH Zurich, Switzerland
1980, Diploma in Electrical Engineering (1980), ETH Zurich, Switzerland

Professional Experience

1988-1995 Visiting Assistant Professor, University of Illinois
1995-1998 Assistant Professor, Purdue University, School of ECE
1998-present Associate Professor, Purdue University, School of ECE

Recent Publication

1. Brian Armstrong and Rudolf Eigenmann, "Performance forecasting: A methodology for characterizing large computational applications", To appear in Proc. of the Int'l Conf. on Parallel Processing, August 1998.
2. Rudolf Eigenmann, Jay Hoeflinger, and David Padua, "On the Automatic Parallelization of the Perfect Benchmarks." IEEE Transactions on Parallel and Distributed Systems, January 1998.
3. Unsung Park and Rudolf Eigenmann, "Ursa Major: Exploring Web Technology for Design and Evaluation of High-Performance Systems," Int'l Conf. on High-Performance Computing and Networking, HPCN Europe'98, Amsterdam, April 1998, pages 535-544.
4. Brian Armstrong, Seon Wook Kim, Insung Park, Michael Voss and Rudolf Eigenmann, "Compiler-Based Tools for Analyzing Parallel Programs." accepted for publication in Parallel Computing, 1998.
- William Blume and Rudolf Eigenmann, "Non-Linear and Symbolic Data Dependence Testing," accepted for publication in IEEE Transactions on Parallel and Distributed Systems, 1998.
5. William Blume, Rudolf Eigenmann, Jay Hoeflinger, David Padua, Paul Petersen, Lawrence Rauchwerger, and Peng Tu, "Parallel Programming with Polaris," IEEE Computer, December 1996.
6. Gregg M. Skinner and Rudolf Eigenmann, "Parallelization and Performance of a Combustion Chemistry Simulation." Scientific Programming, Special Issue: Applications Analysis, 4(3), pages 127--139, 1995.
7. William Blume, Rudolf Eigenmann, Jay Hoeflinger, David Padua, Paul Petersen, Lawrence Rauchwerger, and Peng Tu, "Automatic Detection of Parallelism: A Grand Challenge for High-Performance Computing." IEEE Parallel and Distributed Technology, 2(3), pages 37--47, Fall 1994.
8. D. Padua, R. Eigenmann, J. Hoeflinger, G. Jaxon, Zhiyuan Li, "Restructuring Fortran Programs for Cedar," Concurrency: Practice and Experience, Vol. 5, No. 7, Oct 1993.
9. William Blume and Rudolf Eigenmann, "Performance Analysis of Parallelizing Compilers on the Perfect Benchmarks Programs," IEEE Trans. on Parallel and Distributed Systems, Vol. 3, No. 6., November 1992.

JOSE' FORTES, Professor, School of Electrical and Computer Engineering, Purdue University

J. Fortes is a Professor of Electrical and Computer Engineering. His research interests include Data distribution independent parallel processing, Algorithm transformations for optimizing compilers and systolic array design, Parallel sparse matrix computations for computational electronics, Advanced computer architecture, Parallel symbolic scientific computation, Fault-tolerant computing, Interconnection networks. Fortes has research grants from NSF, ONR, ATT, and General Electric.

Education

1984: Ph.D., Electrical Engineering and Systems, University of Southern California

1981: M.S.E.E., Electrical Engineering, Colorado State University

1978: B.S.E.E., Electrical Engineering, Univ. de Angola

Professional Experience

1995 -present Professor, Purdue University, School of ECE

1989-1995 Associate Professor, Purdue University, School of ECE

1984-1989 Assistant Professor, Purdue University, School of ECE

1989-1990 National Science Foundation, Washington, DC, Program Director, Microelectronic Systems Architecture

1979-1980 Rotary Foundation Fellowship

1991-1994 IEEE Computer Society Distinguished Visitor

Recent Publications

1. Z. Ben-Miled, J.A.B. Fortes, R. Eigenmann and V. Taylor, On the Cost-Efficiency of Hierarchical Heterogeneous Machines for Compiler- and Hand-Parallelized Applications, Int'l Journal of Parallel and Distributed Systems and Networks, 1998.
2. Nirav H. Kapadia, Mark S. Lundstrom, and Jose A. B. Fortes, A Network-Based Simulation Laboratory for Collaborative Research and Technology Transfer, Semiconductor Research Corporation's TECHCON'96, September 1996.
3. W. Shang, M. T. O'Keefe, and J. A. B. Fortes, "On Loop Transformations for Generalized Cycle Shrinking," IEEE Transactions in Parallel and Distributed Systems, Vol. 5, No. 2, pp. 193--204, February 1994.
4. J. A. B. Fortes, B. W. Wah, W. Shang and K. Ganapathy, "Algorithm-specific parallel processing with linear

- processor arrays," *Advances in Computers*, Vol. 38, M. Yovits, ed., Academic Press, 1994.
5. D. Rau, J. A. B. Fortes and H. J. Siegel "Destination Tag Routing Techniques Based on a State Model for the IADM Network," *IEEE Transactions on Computers*, Vol. 41, No. 3, pp. 274--286, March 1992.
 6. W. Shang and J. A. B. Fortes, "On Mapping Uniform Dependence Algorithms into Lower Dimensional Processor Arrays," *IEEE Transactions on Parallel and Distributed Systems*, Vol. 3, No. 3, pp. 350--363, May 1992.
 7. W. Shang and J. A. B. Fortes, "On the Independent Partitioning of Algorithms with Uniform Dependencies," *IEEE Transactions Computers*, Vol. 41, No. 2, pp. 190--206, February 1992.
 8. W. Shang and J. A. B. Fortes, "Time Optimal Linear Schedules for Algorithms with Uniform Dependencies," *IEEE Transactions Computers*, Vol. 40, No. 6, pp. 723--743, June 1991.
 9. W. W. Carlson and J. A. B. Fortes, "On the Performance of Combined Dataflow and Control Flow Systems: Experiments Using Two Iterative Algorithms," *Journal of Parallel and Distributed Computing* 5, pp. 359--382, August 1988.
 10. D. I. Moldovan and J. A. B. Fortes, "Partitioning and Mapping Algorithms into Fixed Size Systolic Arrays," *IEEE Transactions on Computers Systems*, Vol. C-15, No. 3, pp. 1--13, January 1986.

RAY E. EBERTS, Associate Professor, School of Industrial Engineering, Purdue University

R. Eberts is an Associate Professor of Industrial Engineering. He received National Science Foundation Presidential Young Investigator award 1987-1992 and Halliburton Education Foundation Award of Excellence for outstanding achievement and professionalism in education, research, and service to students, 1985. Eberts was the Bachelor of Arts Magna cum Laude, University of California at San Diego, 1977.

Education

1983: Ph.D., Graduate College, University of Illinois at Urbana-Champaign, Department of Psychology.

1979: M.A., Graduate College, University of Illinois at Urbana-Champaign, Department of Psychology with an emphasis in human factors and a minor in Mathematics/quantitative analysis.

1977: B.A., University of California at San Diego. Major: Psychology, Minor: Mathematics.

Professional Experience

1988-Present Associate Professor, School of Industrial Engineering, Purdue University.

1991 Visiting Associate Professor, Industrial and Systems Engineering Department, University of Southern California

1983-1988 Assistant Professor, School of Industrial Engineering, Purdue University.

1990 Invited Professor, NTT Human-Computer Interface Laboratories, Yokosuka, Japan

1981-1982 Intern in Man-Machine Sciences area at Honeywell's Systems and Research Center in Minneapolis

Recent Publications

1. Eberts, R. E., & Brock, J. B. (1984). Computer applications to instruction. In F. W. Muckler (Ed.), *The annual review of human factors* (pp. 239-284). Santa Monica, CA: The Human Factors Society.
2. Eberts, R. E. (1988). Computer-aided education. In C. J. McDonald (Ed.), *Tutorials* (pp. 37-44).
3. Eberts, R. E. (1997). Computer-based instruction. In M. G. Helander, T. K. Landauer, and P. Prabhu (Eds.), *Handbook of human-computer interaction* (2nd Edition). Amsterdam: Elsevier.
4. Eberts, R. E. (1994). *User Interface Design*. Englewood Cliffs, NJ: Prentice-Hall (659 pp.).
5. Eberts, R. E. (1986). Learning strategies and CAI design. *The International Journal of Applied Engineering Education*, 2, 51-59.
6. Eberts, R. E., Villegas, L., Phillips, C., and Eberts, C. (1992). Using neural nets for user assistance in HCI tasks. *International Journal of Human-Computer Interaction*, 4, 59-77.
7. Eberts, R. E., and Nof, S. Y. (1993). Distributed planning of collaborative production. *International Journal of Advanced Manufacturing Technology*, 8, 258-268.
8. Eberts, R. E., and Bittianda, K. P. (1993). Preferred mental models for direct manipulation and command-based interfaces. *International Journal of Man-Machine Studies*, 38, 769-785.
9. Villegas, L., and Eberts, R. E. (1994). A neural network tool for identifying text-editing goals. *International Journal of Human-Computer Studies*, 40, 813-833.
10. Eberts, R. E., and Habibi, S. (1995). Neural Network-Based Agents for Integrating Information. *International*

Journal of Production Economics, 38, 73-84. 6. RECENT COLLABORATORS

G. Salvendy, L. Bringelson, J. Papastavrou, K. Ogawa, T.-Z. Lee 7. GRADUATE STUDENTS ADVISED OVER

JOHN R. RICE, Professor, Department of Computer Sciences, Purdue University

J.R. Rice is W. Brooks Fortune Distinguished Professor of Computer Sciences and Professor of Mathematics, Purdue University. Rice received his Ph.D. in 1959 from the California Institute of Technology. He came to Purdue University in 1964 as Professor of Mathematics and Computer Science and in 1989 he was appointed W. Brooks Fortune Distinguished Professor of Computer Sciences. His professional career includes terms as Chair of the ACM SIGNUM (197073), Vice-President of IMACS (1991-present), and Chair of the Computing Research Association (1991-93). He was founder and Editor-in-Chief of the ACM Transactions on Mathematical Software (1975-1993). Professional honors include the 1975 Forsythe Memorial Lectureship, Fellow of the AAAS, Fellow of the ACM, and election to the USA National Academy of Engineering. His early research work was in approximation theory, numerical analysis and software, and methods for partial differential equations. His current research work is in mathematical software, scientific computing, problem solving environments, and computational science. He has published 19 books (three in the past five years) and over 200 technical articles (53 in the past five years).

Education

1954	B.S.	Mathematics, Oklahoma State University
1956	M.S.	Mathematics, Oklahoma State University
1959	Ph.D.	Mathematics, California Institute of Technology

Professional Experience

1959-60	NRC-NBS Post doctoral Research Associate, National Bureau of Standards
1960-64	Sr. Research Mathematician, Research Laboratories, General Motors Corporation
1964-89	Professor, Purdue University
1970-71	Visiting Professor, University of California, Santa Barbara
1979-80	Visiting Professor, Math. Research Center, University of Wisconsin
1983-96	Head, Computer Science, Purdue University
1989-present	W. Brooks Fortune Distinguished Professor, Purdue University

Recent Publications

1. H.S. McFaddin and J.R. Rice. Collaborating PDE solvers. *Applied Numerical Mathematics*, 10, (1992), 279-295.
2. I.M. Martin, D.C. Marinescu, and J.R. Rice. Adaptive load balancing strategies for solving irregular problems on distributed memory MIMD systems. *Proc. 9th. Intl. Par. Proc. Symp.*, IEEE Press, Los Alamitos, CA (1995), 57-64.
3. J.R. Rice, E.A. Vavalis, and D. Yang. Analysis of a non-overlapping domain decomposition method for elliptic partial differential equations. *J. Comp. Appl. Math.*, 87, (1997), 11-19.
4. E.N. Houstis, J.R. Rice, S. Weerawarana, A.C. Catlin, P. Papachiou, K.Y. Wang, and M. Gaitatzes. PELLPACK: A problem-solving environment for PDE based applications on multi-computer platforms. *ACM Trans. Math. Software*, (1998). (To appear.)
5. M. Mu and J.R. Rice. Modeling with collaborating PDE solvers - Theory and practice. *Comp. Syst. Engr.*, 6, (1995), 87-95.
6. N. Chrisochoides, E.N. Houstis, S.B. Kim, M.K. Samartzis, and J.R. Rice. Parallel iterative methods. In *Computer Methods for Partial Differential Equations VII*, (R. Vichnevetsky, ed.), IMACS, New Brunswick, NJ, (1992), 134-141.
7. N. Chrisochoides and J.R. Rice. Partitioning heuristics for PDE computations based on parallel hardware and geometry characteristics. In *Computer Methods for Partial Differential Equations VII*, (R. Vichnevetsky, ed.), IMACS, New Brunswick, NJ, (1992), 127-133.
8. N. Chrisochoides, E.N. Houstis, and J.R. Rice. Mapping algorithms and software environments for data parallel PDE iterative solvers. *J. Par. Dist. Comp.*, 21, (1994), 75-95.

9. Joshi, T. Drashansky, J.R. Rice, S. Weerawarana, and E.N. Houstis. Multi-agent simulation of complex heterogeneous models in scientific computing. *Math Computers Simulation*, 44, (1997), 43-59.
10. E.N. Houstis, J.R. Rice, N. Ramakrishnan, T. Drashansky, S. Weerawarana, A. Joshi, and C.E. Houstis. Multi-disciplinary problem solving environments for computational science. In *Advances in Computers*, XX (M. Zelkowitz, ed.), (1998).

RICK P. MILLANE, Professor, Department of Food Science, Purdue University

R. P. Millane is a Professor in the Whistler Center for Carbohydrate Research at the department of Food Science. He is member of Purdue's graduate Program in Computational Science and Engineering. Millane is unusually well-positioned for cross-disciplinary research and graduate training in computational algorithms and structural biology. He has a Ph.D. in electrical engineering (image reconstruction), and for the last 17 years has been applying these skills to developing and improving computational algorithms for biological x-ray crystallography. He also has a good knowledge of other computational issues in biology such as in electron microscopy and optical imaging, which will help to draw other investigators into the IGERT project. Dr. Millane is an active participant in the Graduate Program in Computational Science and Engineering at Purdue, and teaches courses in both biological structure and function, and computational image reconstruction. Dr. Millane currently has two active three-year NSF grants (BIR-9418597 and DBI-9722862), both concerned with the development of new computational algorithms for structural biology. He also has two active grants from Purdue University concerned with simulation of biopolymers, and algorithms for optical biological imaging.

Education

1975: B.E. (E.E.) University of Canterbury, New Zealand
1981: Ph.D. (E.E.) University of Canterbury, New Zealand

Professional Experience

1982-85 Research Associate, Department of Biological Sciences, Purdue University, West Lafayette, Indiana
1986-90 Assistant Professor, Whistler Center for Carbohydrate Research, Purdue University, West Lafayette, Indiana
1990-95 Associate Professor, Whistler Center for Carbohydrate Research, Purdue University, West Lafayette, Indiana
1995- Professor, Whistler Center for Carbohydrate Research, Purdue University, West Lafayette, Indiana
1995- Member of Purdue's graduate Program in Computational Science and Engineering

Recent Publications

1. R. P. Millane and W. J. Stroud, Reconstructing symmetric images from their undersampled Fourier intensities, *J. Opt. Soc. Am. A*, 14, 568--579 (1997).
2. R. P. Millane, Multidimensional phase problems, *J. Opt. Soc. Am. A*, 13, 725--734 (1996).
3. R. P. Millane, Phase problems for periodic images: Effects of support and symmetry, *J. Opt. Soc. Am. A*, 10, 1037--1045 (1993).
4. R. P. Millane, Phase retrieval in crystallography and optics, *J. Opt. Soc. Am. A*, 7, 394--411 (1990).
5. W. J. Stroud and R. P. Millane, Cylindrically averaged diffraction by distorted lattices, *Proc. Roy. Soc. London Ser. A*, 452, 151--173 (1996).
6. J. C. Ye, K. J. Webb, T. J. Downar and R. P. Millane, Weighted cost function reconstruction in optical diffusion imaging, *Proc. SPIE*, 3171, 118-127 (1997).
7. J. C. Ye, R. P. Millane, K. J. Webb, T. J. Downar, Effect of the grad D term in optical diffusion imaging, *Signal Recovery and Synthesis, OSA Technical Digest Series*, in press, (1998).

ANASTASIOS S. LYRINTZIS, Associate Professor, School of Aeronautics and Astronautics, Purdue University

A.S. Lyrantzis is Associate Professor of Aeronautics and Astronautics Engineering. He has been referenced in *Who's Who in America* and *Who's Who in Engineering*. He is a registered Professional Engineer (P. E.), an AIAA Associate Fellow and a member of the AIAA Aeroacoustics Technical Committee, the AHS Acoustics Committee, and the ASME Coordinating Group for CFD. He has organized several Sessions and Forums in AIAA, ASME and AHS Conferences. He has co-authored 39 journal papers and 58 conference papers in the areas of Computational Aeroacoustics, Aerodynamics and Continuum Traffic Flow Modeling. He has been awarded several external grants as well as supercomputer resource grants. Lyrantzis has been involved with the application of Kirchhoff's method in rotorcraft aeroacoustics since 1985. He has numerous publications in this area and has written several codes including the RKIR

code that is part of the TRAC (Tilt Rotor Aeroacoustic Codes) system developed by NASA Langley and used by the entire U. S. rotorcraft industry.

Recent Publications

1. Lyrintzis, A. S., and George, A. R., "Far-Field Noise of Transonic Blade-Vortex Interactions," American Helicopter Society Journal, Vol. 34, No. 3, July 1989, pp. 30--39.
2. Xue, Y., and Lyrintzis, A. S., "Rotating Kirchhoff Formulation for 3-D Transonic BVI Noise for a Hovering Rotor," AIAA Journal, Vol. 32, No. 7, July 1994, pp. 1350--1359.
3. Lyrintzis, A. S. "Review: The Use of Kirchhoff's Method in Computational Aeroacoustics," ASME Journal of Fluids Engineering, Vol. 116, No. 4, Dec.1994, pp. 665--676.
4. Lyrintzis, A., Koutsavdis, E., Berezin, C., Visintainer, J., and Pollack, M., "Kirchhoff Acoustic Methodology Validation and Implementation to TiltRotor Aeroacoustic Codes (TRAC)," Proceedings of the 2nd AHS International Aeromechanics Specialists' Conference, Bridgeport, CT, Oct. 1995; also American Helicopter Society Journal}, Vol. 43, No. 1, Jan. 1998, pp. 48--57.
5. Lyrintzis, A. S., Koutsavdis, E. K., and Strawn R. C., "A Comparison of Computational Aeroacoustic Prediction Methods," Proceedings of the 2nd AHS International Aeromechanics Specialists' Conference, Vol. I, Bridgeport, CT, Oct. 1995, pp. 3-58 -- 3-69; also AHS Journal} Vol. 42, No. 1, Jan. 1997, pp. 54--57.
6. Strawn, R. C., Biswas, R., and Lyrintzis, A. S., "Helicopter Noise Predictions using Kirchhoff Methods", Proceedings of 51st AHS Annual Forum, Fort Worth, TX, May, 1995, Vol. I pp. 495--508, awarded best paper in Acoustics sessions also IMACS Journal of Computational Acoustics}, Vol. 4, No. 3, Sept. 1996, pp. 321--339.
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8. Lyrintzis, A. S., and Koutsavdis, E. K., "Rotorcraft Impulsive Noise Prediction Using a Rotating Kirchhoff Formulation," AIAA Journal of Aircraft} Vol. 33, No. 6, Nov.-Dec. 1996, pp. 1054--1061.
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