

VINCENT P. HEURING

Department of Electrical and Computer Engineering
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Education

Ph.D. University of Florida, 1969

B.S. University of Cincinnati, 1966, High Honors

Professional Experience

University of Colorado, Boulder, Department of Electrical and Computer Engineering, Associate/Acting Chair, 2006-, Associate Professor, 1993. Assistant Professor, 1986-1992. Lecturer, 1984-5.

University of Cincinnati Department of Electrical and Computer Engineering, Res. Assoc, 1983.

Zonic Corporation, Cincinnati, Ohio. Manager, Computerized Monitoring Products Division, 1980-1982.

Intelligent Devices, Inc., Cincinnati, Ohio. President, 1977-80.

Procter & Gamble Co., Cincinnati, Ohio. Section Head, Product Development Management, PS&DD Division, 1973-1977. Procter & Gamble Co., Miami Valley Laboratories, Cincinnati, Ohio. Research Department. Research Staff Member, 1969-1973.

Professional Societies and Activities

Associate Director for Education, Optoelectronic Computing Systems Center, Univ. of Colorado, Boulder. 1992-1996.

Program Manager, Digital Optical Computing Program, Center for Optoelectronic Systems, Univ. of Colorado, Boulder. 1990-1991.

Associate Editor for Computing, IEEE Transactions on Education, 1992-1995.

Senior Member, IEEE.

Member, IFIP Working Group 2.4.

Member ACM, AAAS.

Honorary Societies

Phi Beta Kappa, Sigma Xi

Books Published

Miles Murdocca and Vincent P. Heuring, "Computer Architecture & Organization, An Integrated Approach," John Wiley & Sons, Inc., 2007, ISBN-13: 978-0471733881.

Vincent P. Heuring and Harry F. Jordan, "Computer Systems Design and Architecture," 2nd Ed. Prentice-Hall, 2004.

Miles Murdocca and Vincent P. Heuring, "Principles of Computer Architecture," Prentice-Hall, Upper Saddle River NJ, 2000.

Journal Publications

Irvin R. Jones Jr., Vincent P. Heuring. "Modeling and Simulating Free-Space Optoelectronic Architectures with Petri Nets," *Applied Optics*, , 6127-6135, **37** #26, 1998.

Lianhua Ji and Vincent P. Heuring, "The Impact of Gate Fanin and Fanout Limits on Optoelectronic Digital Circuits," *Applied Optics*, 3927-3940, **36** #17, 1997.

Harry F. Jordan, Vincent P. Heuring, Robert Feuerstein, "Optoelectronic Time-of-Flight Design and the Demonstration of an All-Optical, Stored Program Digital Computer," *Proc. IEEE*, **82** #11, Nov. 1994.

Vincent Heuring, Lian H. Ji, R. J. Feuerstein, V. N. Morozov, "Toward a free-space parallel optoelectronic computer: a 300 MHz optoelectronic counter using holographic interconnects," *Applied Optics*, **33** #32, 7579- 7587, 1994.

Todd Main, Robert J. Feuerstein, Harry F. Jordan, Vincent P. Heuring, John Feehrer, Carl Love, "Implementation of a General Purpose Stored Program Digital Optical Computer," *Applied Optics*, **33** #8, 1619-1628, 1994.

Jonathan P. Pratt, Vincent P. Heuring, "Designing Digital Optical Computing Systems: Power Distribution and Crosstalk," *Applied Optics*, #23, 4657-4661, 1992.

V. P. Heuring, H. F. Jordan, J. P. Pratt. "A Bit Serial Architecture for Optical Computing." *Applied Optics*. #17, 3213-3224, 1992.

Jonathan P. Pratt, Vincent P. Heuring, "Delay Synchronization in Time-of-Flight Optical Systems." *Applied Optics*. #14, 2430-2437, 1992.

T. J. Soukup, R. J. Feuerstein, V. P. Heuring "Implementation of a fiber optic delay line memory." *Applied Optics*. #17, 3233-3240, 1992.

A. Gayler Harford, Vincent P. Heuring, Michael G. Main, "A New Parsing Method for Non-LR(1) Grammars," *Software - Practice and Experience*, #5, 419-437, 1992.

Robert W. Gray, Vincent P. Heuring, Steven P. Krane, Anthony M. Sloane, William M. Waite, "Eli: A Complete, Flexible Compiler Construction System." *Communications of the ACM.*- #2, 121-131, 1992.

Vincent P. Heuring, "Systems Considerations in the Implementation of a Bit Serial Optical Computer." *Optical Engineering.* #12, 1931-1935, 1991.

Alan F. Benner, Harry F. Jordan, and Vincent P. Heuring, "Digital Optical Computer with Optically Switched Directional Couplers," *Optical Engineering.* #12, 1936-1941, 1991.

R. J. Feuerstein, T. Soukup, V. P. Heuring, "100 MHz Optical Counter using Directional Coupler Switches." *Optics Letters.* #20, 1599-1601, 1991.

A. F. Benner, J. Bowman, T. Erkkila, R. J. Feuerstein, V. P. Heuring H. F. Jordan, J. Sauer and T. Soukup, "Digital Optical Counter using Directional Coupler Switches," *Applied Optics.* #29, 4179-4189, 1991.

David B. Sarrazin, Harry F. Jordan, and Vincent P. Heuring, "Fiber-Optic Delay Line Memory," *Applied Optics,* #5, 627-637, 1990.

V. P. Heuring, "The Robot as a Finite State Machine," *Laboratory Robotics and Automation,* 55-63, 1990.

V. P. Heuring, U. Kastens, G. Plummer, W. Waite. "COMAR, A Data Format for Integration of Context Free Grammar Tools," *The Computer Journal,* #5, 445-452, 1989.

V. P. Heuring. "The Automatic Generation of Fast Lexical Analyzers," *Software - Practice & Experience* #9, 801-818, 1986.

V. P. Heuring, "The Teaching of Assembly Language to Computer Science and Computer Engineering Majors" *SIGCSE Bulletin, ACM,* **16** #4, 12, 1984.

V. P. Heuring and W. S. Brey. "The Moment Method as a Tool for the Study of Chemical Exchange by Nuclear Magnetic Resonance." *J. Magnetic Resonance,* **3**, 468, 1970.

V. P. Heuring and K. N. Scott. "Spectrum Simplification by Broadband Homonuclear Decoupling." *J. Magnetic Resonance*, **2**, 302, 1970.

V. P. Heuring and W. S. Brey. "NMR Studies of Chemical Exchange: The Moment Method," *J. Chemical Physics*," **50**, 1025, 1969.

Conference Proceedings

January, 1998. Irvin R. Jones Jr., Vincent P. Heuring. "Modeling and Simulating Free-Space Optoelectronic Architectures with Petri Nets," Invited paper accepted for publication in *IFIP Proceedings of SI2000*, Berlin, Germany

Vincent P. Heuring, Melanie D. Berg, "The Design of an Optoelectronic Graphics Display Processor," in *Optical Computing*, Vol. 10, 1995, Optical Society of America Technical Digest Series, 43-45, March, 1995.

Lianhua Ji, Vincent P. Heuring, "The Impact of Gate Fanin and Fanout Limits on Optoelectronic Circuit Speed," in *Optical Computing*, Vol. 10, 1995, Optical Society of America Technical Digest Series, 52-54, March, 1995.

Vincent P. Heuring and Valentin N. Morozov, "Synchronizing and Controlling Fast Digital Optical Processors," in *Optical Computing Technical Digest*, 1993, Optical Society of America, Washington DC, pp. 188-191, 1993.

Invited Speaker -- Vincent P. Heuring, "Time of Flight Latchless Architectures," 1993 IEEE Winter VLSI Workshop, Asilomar CA, Feb. 8-10, 1993.

Vincent P. Heuring and Valentin N. Morozov, "Synchronizing and Controlling Fast Digital Optical Processors," in *Optical Computing Technical Digest*, 1993, Optical Society of America, Washington DC, pp. 188-191, 1993.

P. T. Main, R. J. Feuerstein, V. P. Heuring, H. F. Jordan, J. R. Feehrer, C. E. Love, "Implementation of a General Purpose Stored Program Digital Optical Computer," in *Optical Computing Technical Digest*, 1993, Optical Society of America, Washington DC, pp. 322-325, 1993.

Vincent P. Heuring, Valentin Morozov, "An all-optical finite-state machine controller with holographic control-store ROM." *Optical Society of America Annual Meeting*, Paper No. C-00207, Albuquerque, NM, Sept. 20-25, 1992.

Valentin Morozov, Vincent P. Heuring, "Parallel algorithms for an all optical boolean matrix ALU." Paper No. C-00261, *Optical Society of America Annual Meeting*, Albuquerque, NM, Sept. 20-25, 1992.

Vincent P. Heuring, Valentin Morozov, "An Optically Controlled Digital Optical Matrix Processor." *Proc. SPIE*, Paper 1773b-03, San Diego, CA., July 19-24,, 1992.

Harry F. Jordan, Vincent P. Heuring, "Time-Multiplexed Optical Computers." Supercomputing '91, Albuquerque, NM, Nov. 18-22, 1991

Todd J. Soukup, Vincent P. Heuring, "Implementation of a Fiber Optic Delay Line Memory." Optical Computing, 1991, Technical Digest Series, Optical Society of America, , 112-115 (1991).

Jonathan P. Pratt, Vincent P. Heuring, "Designing Digital Optical Computing Systems: Power Distribution and Crosstalk." International Congress on Optical Science and Engineering, Proc. SPIE, , Paper No. 14, Mar. 11-15, 1991.

Jonathan P. Pratt, Vincent P. Heuring, "Designing Continuous Dataflow Optical Computing Systems, I. Synchronization," Optical Society of America 1990 Annual Meeting Technical Digest, 123, November 4-9, 1990.

Invited Speaker -- "Language Development Systems in Support of Software Engineering," Proceedings of the Workshop on Software Tools for Distributed Control Systems, 121-126, July 17-19, 1990, Pacifica, CA.

Vincent P. Heuring. "Implementation of a Bit Serial Optical Computer," Proc. SPIE, 322-329 (1990).

A. F. Benner, H. F. Jordan, V. P. Heuring. "Optically Switched Lithium Niobate Directional Couplers for Digital Optical Computing," Proc. SPIE, 343-352 (1990).

D. B. Sarrazin, H. F. Jordan, V. P. Heuring. "Digital Fiber Optical Delay Line Memory," Proc. SPIE, 366-375 (1990).

Invited Speaker -- U. S. Army Research Office Strategic Planning Workshop -- "Automated Tools for Software Engineering," June 19-22, Pinehurst, NC.

J. Sauer, V. P. Heuring, H. F. Jordan, J. P. Pratt. "The Bit Serial Optical Computer Project," Proc. OSA Annual Meeting, Santa Clara, CA, October, 1988.

V. P. Heuring, H. F. Jordan, J. P. Pratt. "Bit Serial Optical Computer Design," Proc. SPIE, 346-353, 1988.

W. M. Waite, V. P. Heuring, U. Kastens. "Configuration Control in Compiler Construction," in Proceedings of the 1988 International Workshop on Software Version and Configuration Control. Teubner, Stuttgart, FRG, 1988.

Other Publications

Murdocca, M. J. and V. P. Heuring, "The Memory Hierarchy," in: Encyclopedia of Computer Science, 4/e, van Nostrand Reinhold, (2000).

Grants and Contracts

Vincent P. Heuring, Addison-Wesley-Longman, "Software Modules for the TTL, Teaching Training and Learning System, \$22,500. June, 1997 - August, 1997.

Vincent P. Heuring, Office of Naval Research Grant, "An Optoelectronic Graphic Display Processor, \$350,259. March, 1993 - March 1996.

V. P. Heuring, W. M. Waite, Army Research Office Grant, "A Domain Specific Software Development System," \$75,000, June 1992 - May 1995.

W. T. Cathey, V. P. Heuring, K. M. Johnson, G. Moddel, W. T. Rhodes, "Center for Optoelectronic Computing Systems," \$3,312,526, May 1991 - Apr, 1992.

V. P. Heuring, W. M. Waite, Army Research Office Grant, "Accelerating the Transfer of Technology for Implementing Domain Specific Software Architectures," \$55,000, Nov, 1991 - June, 1992.

V. P. Heuring, National Science Foundation, "Research Experiences for Undergraduates," \$28,000. June, 1990 - August, 1990.

V. P. Heuring, W. M. Waite, and G. Fischer, Army Research Office Grant: "Automatic Compiler Construction," \$322,204. June, 1986 - October, 1989.

W. M. Waite, V. P. Heuring, U. Kastens, Martin Marietta (Center for Software System Science): "Compiler Construction Tools," \$17,304. Sept. 1989 - Dec 1989.

V. P. Heuring and W. M. Waite. National Science Foundation Grant: "Minicomputer for Expert System Research and Development," \$165,866. September, 1985 - February, 1987. With W. M. Waite.

V. P. Heuring. AT&T Foundation Grant: "Computer Laboratory," \$22,000. January, 1985 - January, 1986.

Recent Consulting

US Patent and Trademark Office
Addison-Wesley-Longman Publishing

Patents Granted

Vincent P. Heuring, Optoelectronic Computer Graphics System and Method, US Patent # 5,515,498, May 7, 1996.

Vincent P. Heuring, Harry F. Jordan, Jonathan P. Pratt, Optical Logic Circuit Useful for Bit Serial Optical Computing, US. Patent No. 4,900,115, February 13, 1990.