Robert Louis Stevenson

Curriculum Vitae

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Professional Experience

10/2013–Present	Associate Chair, Director of Undergraduate Studies Department of Electrical Engineering University of Notre Dame, Notre Dame, Indiana
08/2002–Present	Professor Department of Electrical Engineering University of Notre Dame, Notre Dame, Indiana
01/2003–6/2017	Professor Department of Computer Science and Engineering University of Notre Dame, Notre Dame, Indiana
08/1996–08/2002	Associate Professor Department of Electrical Engineering University of Notre Dame, Notre Dame, Indiana
08/1996–06/1997	Visiting Associate Professor Department of Electrical and Computer Engineering University of Delaware, Newark, Delaware
06/1994–08/1994	Research Associate Intel Corporation, Hillsboro, Oregon
05/1993–08/1993	Research Associate Air Force Office of Scientific Research Rome Laboratories, Griffiss AFB, Rome, New York

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08/1990–08/1996	Assistant Professor Department of Electrical Engineering University of Notre Dame, Notre Dame, Indiana
08/1989–08/1990	Graduate Research Assistant School of Electrical Engineering Purdue University, West Lafayette, Indiana
08/1986–08/1990	Graduate Teaching Assistant School of Electrical Engineering Purdue University, West Lafayette, Indiana
06/1986–08/1986	Intern Engineering Physics Laboratory, E. I. duPont de Nemours & Company, Wilmington, Delaware
06/1985–08/1985	Intern Corporate Technology Center Sperry Corporation, Reston, Virginia

Education

08/1986–08/1990 *Ph.D., Electrical Engineering*, August 1990
Purdue University, West Lafayette, Indiana
Thesis: *Invariant Reconstruction of Curves and Surfaces with Discontinuities with Applications in Computer Vision*
Advisor: Professor Edward J. Delp
GPA: 6.0/6.0

09/1982–06/1986 *B.S.E.E., Electrical Engineering*, June 1986
University of Delaware, Newark, Delaware
Thesis: *On the Theoretical Properties of Morphological Filters*
Advisor: Professor Gonzalo R. Arce
GPA: 4.0/4.0

Honors and Awards

1983	University of Delaware, Tau Beta Pi Prize
1984	University of Delaware, Engineering Scholar
1985–1986	University of Delaware, Liston A. Houston Scholarship
1986	IEEE Delaware Bay Section Engineering Award

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1986	Valedictorian, University of Delaware
1986	Purdue University Graduate Instructor Fellowship
1986	Phi Kappa Phi Graduate Fellowship
1986–1990	DuPont Graduate Fellowship in Electrical Engineering
1986–1989	National Science Foundation Graduate Fellowhip
1993	University of Notre Dame, Department of Electrical Engineering Outstanding Teacher Award
2012	ICIP 2012 Outstanding Reviewer
2013	IS&T 2013 Service Award
2023	University of Notre Dame, Department of Electrical Engineering Outstanding Teacher Award
2023	University of Notre Dame, The Rev. Edmund P. Joyce, C.S.C., Award for Excellence in Undergraduate Teaching, University of Notre Dame
2024	University of Notre Dame, The College of Engineering Outstanding Teacher Award

Honor Societies

1985–Present	Eta Kappa Nu, Electrical Engineering Honor Society
1985–Present	Tau Beta Pi, Engineering Honor Society
1985–Present	Phi Kappa Phi, Academic Honor Society

Professional Activities

Associate Editor

IEEE Trans. on Image Processing, 1999–2003
IEEE Trans. on Circuits and Systems for Video Tech., 1997–2002
Journal of Electronic Imaging, 1995–1998

Special Issue Editor

Multimedia Systems, *Journal of Electronic Imaging*, 04/1996
Still Image Compression, *Electronic Imaging Newsletter*, 01/1996

Best Paper Award Board Membership

IEEE Trans. on Circuits and Systems for Video Technology, 2002

Symposium Chairman

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SPIE/IS&T Symposium on Electronic Imaging, 02/2004

Conference Chairman

IS&T Conf. Computational Imaging XXI, 01/2023
IS&T Conf. Computational Imaging XX, 01/2022
IS&T Conf. Computational Imaging XIX, 01/2021
IS&T Conf. Computational Imaging XVIII, 01/2020
IS&T Conf. Computational Imaging XVII, 01/2019
IS&T Conf. Computational Imaging XVI, 02/2018
IS&T Conf. Computational Imaging XV, 02/2017
IS&T Conf. on Visual Information Proc. & Comm. VIII, 02/2017
IS&T Conf. on Visual Information Proc. & Comm. VII, 02/2016
SPIE/IS&T Conf. on Visual Information Proc. & Comm. VI, 02/2015
SPIE/IS&T Conf. on Visual Information Proc. & Comm. V, 02/2014
SPIE/IS&T Conf. on Visual Information Proc. & Comm. IV, 02/2013
SPIE/IS&T Conf. on Visual Information Proc. & Comm. III, 01/2012
SPIE/IS&T Conf. on Visual Information Proc. & Comm. II, 01/2011
SPIE/IS&T Conf. on Visual Comm. and Image Processing, 01/2009
SPIE/IS&T Conf. on Computational Imaging, 02/2003
SPIE/IS&T Conf. on Image and Video Comm. and Proc., 02/2000
SPIE/IS&T Conf. on Visual Comm. and Image Processing, 02/1999
41st Midwest Symposium on Circuits and Systems, 08/1998
SPIE Conf. on Electronic Imaging and Signal Processing, 11/1996
SPIE/IS&T Conf. on Still Image Compression II, 02/1996
SPIE/IS&T Conf. on Image and Video Processing IV, 02/1996
SPIE/IS&T Conf. on Image and Video Processing III, 02/1995
SPIE/IS&T Conf. on Image and Video Processing II, 02/1994

Steering Committee Member

Visual Communications and Image Processing, 1998–2010
Midwest Symposium on Circuits and Systems, 1994–1999
Electronic Imaging, 2003–2005

Organizing Committee Member

Nonlinear Signal and Image Processing Workshop, 2001

Technical Program Committee

International Conference on Image Processing, 1998 – Present
SPIE Computational Imaging, 2003–2016
Visual Communications and Image Processing, 1997–2008
European Signal Processing Conference, 2015
IEEE Symposium on Industrial Electronics & Applications, 2012
International Conference on Multimedia & Expo, 2009–2010

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Image and Video Communications and Processing III, 2005
Computational Imaging, 2004
International Conference on Pattern Recognition, 2000
Int. Conf. on Acoustics, Speech, & Signal Proc., 2000, 2006–Present
International Symposium on Circuits and Systems, 1998, 2005
9th IEEE Image and Multi. Signal Processing Workshop, 1996
Midwest Symposium on Circuits and Systems, 1994

Member
Institute of Electrical and Electronics Engineers, IEEE
Society of Photographic Instrumentation Engineers, SPIE
The Society for Imaging Science and Technology, IS&T

Panel Member for the following funding agencies
National Science Foundation

Reviewer for the following funding agencies
National Science Foundation
U.S. Army Research Office
Israel Science Foundation
Hong Kong Research Grants Council
Kentucky EPSCoR Program
North Dakota EPSCoR Program
Louisiana Board of Regents

Reviewer for the following archival journals
IEEE Transactions on Signal Processing
IEEE Transactions on Image Processing
IEEE Transactions on Circuits and Systems
IEEE Transactions on Circuits and Systems for Video Technology
IEEE Transactions on Instrumentation and Measurement
IEEE Transactions on Medical Imaging
IEEE Transactions on Pattern Analysis and Machine Intelligence
IEEE Transactions on Systems, Man, and Cybernetics
IEEE Transactions on Neural Networks
Pattern Recognition Letters
Signal Processing Letters
Computer Vision, Graphics, and Image Processing
Journal of the Optical Society of America
Journal of Mathematical Imaging and Vision
Applied Optics
IET Image Processing

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Reviewer for the following textbook companies
Van Nostrand Reinhold, Electrical Engineering Division
McGraw-Hill, College/Schaum Division
MacMillan Publishing Company
Prentice Hall

Publications

Journals

R. L. Stevenson and G. R. Arce, "Binary Display of Hexagonally Sampled Continuous–Tone Images," *Journal of the Optical Society of America A*, Vol. 2, pp. 1009–1013, July 1985.

G. R. Arce and **R. L. Stevenson**, "On the Synthesis of Median Filter Systems," *IEEE Transactions on Circuits and Systems*, Vol. CAS-34, No. 4, pp. 420–429, April 1987.

R. L. Stevenson and G. R. Arce, "Morphological Filters: Statistics and Further Syntactic Properties," *IEEE Transactions on Circuits and Systems*, Vol. CAS-34, No. 11, pp. 1292–1305, November 1987.

R. L. Stevenson and E. J. Delp, "Invariant Recovery of Curves in M–Dimensional Space from Sparse Data," *Journal of the Optical Society of America A*, Vol. 7, No. 3, pp. 480–490, March 1990.

R. L. Stevenson and E. J. Delp, "Viewpoint Invariant Recovery of Visual Surfaces from Sparse Data," *IEEE Transactions on Pattern Analysis and Machine Intelligence,* Vol. 14, No. 9, pp. 897–909, September 1992.

R. L. Stevenson and S. M. Schweizer, "A Nonlinear Filtering Structure for Image Smoothing in Mixed Noise Environments," *Journal of Mathematical Imaging and Vision*, Vol. 2, No. 2/3, pp. 137–154, November 1992.

R. L. Stevenson, G. B. Adams, L. H. Jamieson and E. J. Delp, "Parallel Implementation for Iterative Image Restoration Algorithms on a Parallel DSP Machine," *Journal of VLSI Signal Processing*, Vol. 5, No. 2/3, pp. 261–272, April 1993.

R. L. Stevenson, B. E. Schmitz, and E. J. Delp, "Discontinuity Preserving Regularization of Inverse Visual Problems," *IEEE Transactions*

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on Systems, Man and Cybernetics, Vol. 24, No. 3, pp. 455–469, March 1994.

R. R. Schultz and **R. L. Stevenson**, "Improved Definition Image Expansion," *IEEE Transactions on Image Processing*, Vol. 3, No. 3, pp. 233–242, May 1994.

T. P. O'Rourke and **R. L. Stevenson**, "Human Visual System Based Wavelet Decomposition for Image Compression," *Journal of Visual Communications and Representation*, Vol. 6, No. 2, pp. 109–121, June 1995.

R. R. Schultz and **R. L. Stevenson**, "Stochastic Modeling and Estimation of Multispectral Image Data," *IEEE Transactions on Image Processing*, Vol. 4, No. 8, pp. 1109–1119, August 1995.

B. E. Schmitz and **R. L. Stevenson**, "Color Palette Restoration," *CVGIP: Graphical Models and Image Processing*, Vol. 57, No. 5, pp. 409–419, September 1995.

S. Choi, R. R. Schultz, **R. L. Stevenson**, Y. Huang, and R. Liu, "Contrast Enhancement of Missile Video Sequence via Image Stabilization and Product Correlation," *Optical Engineering*, Vol. 35, No. 12, pp. 3495–3507, December 1995.

T. P. O'Rourke and **R. L. Stevenson**, "Improved Image Decompression for Reduced Transform Coding Artifacts," *IEEE Transactions on Circuits and Systems for Video Technology*, Vol. 5, No. 6, pp. 490-499, December 1995.

R. R. Schultz and **R. L. Stevenson**, "Extraction of High-Resolution Frames from Video Sequences," *IEEE Transactions on Image Processing,* special issue on Nonlinear Image Processing, Vol. 5, No. 6, pp. 996–1011, June 1996.

R. L. Stevenson, "Inverse Halftoning via MAP Estimation," *IEEE Transactions on Image Processing*, Vol. 6, No. 4, pp. 574-583, April 1997.

B. E. Schmitz and **R. L. Stevenson**, "Enhancement of Sub-Sampled Color Image Data," *IEEE Transactions on Image Processing,* special issue on Color Image Processing, Vol. 6, No. 7, pp. 1052–1056, July

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1997.

R. R. Schultz, L. Meng, and **R. L. Stevenson**, "Subpixel Motion Estimation for Super-Resolution Image Sequence Enhancement," *Journal of Visual Communication and Image Representation*, special issue on High-Fidelity Media Processing, Vol. 9, No. 1, pp. 38–50, March 1998.

R. Llados-Bernaus and **R. L. Stevenson**, "Fixed Length Entropy Coding for Robust Video Compression", *IEEE Transactions on Circuits and Systems for Video Technology*, Vol. 8, No. 6, pp. 745–755, October 1998.

R. Llados-Bernaus and **R. L. Stevenson**, "Edge Assisted Upper Band Coding Techniques", *International Journal of Imaging Systems and Technology*, Vol. 10, pp. 67–75, January 1999.

Z. Peng, Y.-F. Huang, D. J. Costello, Jr., and **R. L. Stevenson**, "A Pyramidal Image Coder Using Generalized Rank-Ordered Prediction Filter", *IEEE Transactions on Circuits & Systems for Video Technology*, Vol. 9, No. 4, pp. 540–544, June 1999.

M. A. Robertson and **R. L. Stevenson**, "Reduced-Complexity Iterative Post-Filtering of Video," *IEEE Transactions on Circuits and Systems for Video Technology* Vol. 11, No. 10, pp. 1121–1128, October 2001.

M. A. Robertson and **R. L. Stevenson**, "Temporal Resolution Enhancement in Compressed Video Sequences," *EURASIP Journal on Applied Signal Processing*, Special Issue on Nonlinear Signal Processing, pp. 230–238, December 2001.

B. E. Marino and **R. L. Stevenson**, "Improving the Performance of Single Chip Image Capture Devices," *Journal of Electronic Imaging*, Vol. 12, No. 2, pp. 209–218, April 2003.

M. A. Robertson, S. Borman, and **R. L. Stevenson**, "Estimation-Theoretic Approach to Dynamic Range Improvement Through Multiple Exposures," *Journal of Electronic Imaging* Vol. 12, No. 2, pp. 219–228, April 2003.

R. Magill, C. E. Rohrs, and **R. L. Stevenson**, "Output-Queued Switch Emulation by Fabrics with Limited Memory," *IEEE Journal on Se-*

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lected Areas in Communications, Special Issue on High-Performance Electronic Switches/Routers for High-Speed Internet, Vol. 21, No. 4., pp. 606–615, May 2003.

M. A. Robertson and **R. L. Stevenson**, "DCT Quantization Noise in Compressed Images," *IEEE Transactions on Circuits and Systems for Video Technology*, Vol. 15, No. 1, pp. 27-38, January 2005.

J. Gai and **R. L. Stevenson**, "Studentized Dynamical System for Robust Object Tracking," *IEEE Transactions on Image Processing*, Vol. 20, No. 1, pp. 186-199, January, 2011.

J. Gai and **R. L. Stevenson**, "Robust Contour Tracking Based On A Coupling Between Geodesic Active Contours and Conditional Random Fields," *Journal of Visual Communications and Image Representations*, Vol. 22, No. 1, pp. 22-47, January 2011.

J. Simpkins and **R. L. Stevenson**, "A Parameterized Spatially-Varying PSF Model," *Journal of Electronic Imaging*, Vol. 23, No. 1, January, 2014.

Y. Li, and **R. L. Stevenson**, "Incorporating Global Information in Feature-Based Multimodal Image Registration," *Journal of Electronic Imaging*, Vol. 23, No. 2, March-April 2014.

Y. Li, and **R. L. Stevenson**, "A Similarity Metric for Matching Incomplete Edge Curves," *International Journal of Machine Intelligence and Sensory Signal Processing*, Vol. 1, No. 2, pp. 153-173, 2014.

L. Hollmann and **R. L. Stevenson**, "Pole-Zero Placement Algorithm for the Design of Digital Filters with Fractional-Order Rolloff," *Signal Processing* special issue on fractional signal processing and applications, Vol. 107, pp. 218-229, February 2015.

R. Zhen, and **R. L. Stevenson**, "Multi-Image Motion Deblurring Aided By Inertial Sensors," *Journal of Electronic Imaging,* Vol. 25, No. 1, February 2016 .

Y. Li, and **R. L. Stevenson**, "Multimodal Image Registration With Line Segments By Selective Search," *IEEE Transactions on Cybernetics*, Vol. PP, No. 99, April 2016.

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L. Hollmann and **R. L. Stevenson**, "Adaptive whitening of ambient ocean noise with narrowband signal preservation" *Journal of the Acoustical Society of America*, Vol. 129, No. 6, pp. 3122, 3133, June, 2016.

R. Zhen and **R. L. Stevenson**, "Inertial Sensor Aided Multi-Image Nonuniform Motion Blur Removal Based on Motion Decomposition," *Journal of Electronic Imaging,* Vol. 27, No. 5, October, 2018.

Y. Li, L. Wang, **R. L. Stevenson**, L. Wei, and R. Fan, "Reliable Line Segment Matching for Multispectral Images Guided by Intersection Matches," *IEEE Transactions on Circuits and Systems for Video Technology*, Vol. 29, No. 10, October 2019

M. R. Izadi, **R. L. Stevenson**, and L. N. Kloepper "Separation of Overlapping Sources in Bioacoustic Mixtures," *Journal of the Acoustical Society of America*, Vol. 147, No. 3, March 2020.

S. Zhang, A. Zhen, and **R. L. Stevenson**, "Deep Motion Blur Removal Using Noisy/Blurry Image Pairs," *Journal of Electronic Imaging*, Vol. 30, No. 3, 2021.

K. Kniazev, I. Pavlovets, S. Zhang, J. Kim, **R. Stevenson**, K. Doudrick, M. Kuno, "Using Infrared Photothermal Heterodyne Imaging to Characterize Micro- and Nano-Plastics in Complex Environmental Matrices," *Environmental Science & Technology,* Vol. 55, No. 23, November 2021.

S. Zhang, K. Kniazev, I. Pavlovetc, S. Zhang, **R. Stevenson**, Masaru Kuno, "Deep Image Restoration for Infrared Photothermal Heterodyne Imaging," *The Journal of Chemical Physics,* Vol. 155, No. 21, December 2021.

S. Zhang, A. Zhen, and **R. L. Stevenson**, "DeblurExpandNet: Image Motion Deblurring Network Aided by Intertial Sensor Data," *Signal and Image Processing*, January, 2022 (https://doi.org/10.1007/s11760-021-02067-1).

K. Eveland, **R. Stevenson**, P. Domski, D. Vanderelst, L. Kloepper, " Spatial Differences in Soundscape for Bats on the Edge Versus Center of a Bat Swarm," to appear in *Proceedings of Meetings on Acoustics,* 51,(1), 2023.

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L. N. Kloeepper, G. K. Taylor, P. Domski, D. Vanderelst, K. Eveeland, and **R. L. Stevenson**, "HawkEar: a bird-borne visual and acoustic platform for eavesdropping the behavior of mobile animals," to appear in *Methods in Ecology and Evolution*, 2024.

Journals Articles Reprinted in Books

R. L. Stevenson and G. R. Arce, "Binary Display of Hexagonally Sampled Continuous–Tone Images," originally appeared as *Journal of the Optical Society of America A*, Vol. 2, pp. 1009–1013, July 1985, reprinted in *Selected Papers on Digital Halftoning*, SPIE Milestone Series, Vol. MS 154, J. Allebach, Ed., 1999.

Book Chapters

R. L. Stevenson and E. J. Delp, "Investigation into Building an Invariant Surface Model from Sparse Data," in *NATO ASI: Active Perception and Robot Vision*, A. Sood and H. Wechsler, Eds., Springer Verlag, pp. 539–558, 1992.

R. L. Stevenson and E. J. Delp, "Three–Dimensional Surface Reconstruction: Theory and Implementation," in *3D Object Recognition Systems*, A. K. Jain and P. J. Flynn, Eds., Elsevier, pp. 89–114, 1993.

D. L. Cohn and **R. L. Stevenson**, "Using Redundancy to Speed up Disk Arrays," in *Communications and Cryptography: Two Sides of One Tapestry*, R. E. Blahut, D. J. Costello, Jr., U. Maurer and T. Mittelholzer, Eds., Kluwer Academic Publishers, pp. 59–68, 1994.

R. Llados-Bernaus, M. Robertson and **R. L. Stevenson**, "A Stochastic technique for the removal of artifacts in compressed images and video", in *Signal Recovery Techniques for Image and Video Compression and Transmission*, A. K. Katsaggelos and N. P. Galatsanos, Eds., Kluwer Academic Publishers, 1998.

S. Borman and **R. L. Stevenson**, "Image Sequence Processing," in *Dekker Encyclopedia of Optical Engineering*, R. B. Johnson, C. Hoffman, and R. G. Driggers, Eds., Marcel Dekker, Inc., 2003.

R. Schultz and **R. L. Stevenson**, "Bayesian Image and Video Enhancement Using a Non-Gaussian Prior," in *Nonlinear Signal and Im-*

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age Processing: Theory, Methods, and Applications, K. Barner and G. Arce, Eds., CRC Press, 2003.

J. Simpkins and **R. L. Stevenson**, "An Introduction to Super-Resolution Imaging," in *Mathematical Optics: Classical, Quantum, and Imaging Methods*, V. Lakshminarayanan, Ed., Taylor & Francis Books, Inc., 2012.

J. Simpkins, **R. L. Stevenson**, and S. Borman, "Image Sequence Processing," in *Encyclopedia of Optical Engineering*, R. G. Driggers and C. Hoffman, Eds., Taylor & Francis., 2015.

R. Zhen and **R. L. Stevenson**, "Image Demosaicing," *Color Image and Video Enhancement*, pp. 13–54, Springer, 2015.

Edited Conference Proceedings

S. A. Rajala and **R. L. Stevenson**, Eds., *Image and Video Processing II*, SPIE Proceedings Series, 1994.

R. L. Stevenson and S. A. Rajala, Eds., *Image and Video Processing III*, SPIE Proceedings Series, 1995.

R. L. Stevenson and M. I. Sezan, Eds., *Image and Video Processing IV*, SPIE Proceedings Series, 1996.

R. L. Stevenson, A. Drukarev, and T. R. Gardos, Eds., *Still Image Compression II*, SPIE Proceedings Series, 1996.

C.-S. Li, **R. L. Stevenson**, and L. Zhou, Eds., *Electronic Imaging and Multimedia Systems*, SPIE Proceedings Series, 1996.

R. L. Stevenson, Ed., *Proceeding of the Midwest Symposium on Circuits and Systems*, 1998.

K. Aizawa, **R. L. Stevenson**, and Y.-Q. Zhang, Eds., *Visual Communications and Image Processing '99*, SPIE Proceedings Series, 1999.

B. Vasudev, T. R. Hsing, A. G. Tescher, and **R. L. Stevenson**, Eds., *Image and Video Communications and Processing 2000*, SPIE Proceedings Series, 2000.

C. Bouman and **R. L. Stevenson**, Eds., *Computational Imaging 2003*,

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SPIE Proceedings Series, 2003.

M. Rabbani and **R. L. Stevenson**, Eds., *Visual Communications and Image Processing 2009*, SPIE Proceedings Series, 2009.

A. Said, O. G. Guleryuz, and **R. L. Stevenson**, Eds., *Visual Information Processing and Communication II*, SPIE Proceedings Series, 2011.

A. Said, O. G. Guleryuz, and **R. L. Stevenson**, Eds., *Visual Information Processing and Communication III*, SPIE Proceedings Series, 2012.

A. Said, O. G. Guleryuz, and **R. L. Stevenson**, Eds., *Visual Information Processing and Communication IV*, SPIE Proceedings Series, 2013.

A. Said, O. G. Guleryuz, and **R. L. Stevenson**, Eds., *Visual Information Processing and Communication V*, SPIE Proceedings Series, 2014.

A. Said, O. G. Guleryuz, and **R. L. Stevenson**, Eds., *Visual Information Processing and Communication VI*, SPIE Proceedings Series, 2015.

A. Said, O. G. Guleryuz, and **R. L. Stevenson**, Eds., *Visual Information Processing and Communication VII*, IS&T, 2016.

R. L. Stevenson and E. Delp, Eds., *Visual Information Processing and Communication VIII*, IS&T, 2017.

C. Bouman and **R. L. Stevenson**, Eds., *Computational Imaging XV*, IS&T, 2017.

C. Bouman and **R. L. Stevenson**, Eds., *Computational Imaging XVI*, IS&T, 2018.

C. Bouman, G. T. Buzzard, and **R. L. Stevenson**, Eds., *Computational Imaging XVII*, IS&T, 2019.

C. Bouman, G. T. Buzzard, and **R. L. Stevenson**, Eds., *Computational Imaging XVIII*, IS&T, 2020.

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C. Bouman, G. T. Buzzard, and **R. L. Stevenson**, Eds., *Computational Imaging XIX*, IS&T, 2021.

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Conference Papers

G. R. Arce and **R. L. Stevenson**, "On the Synthesis of Median Filter Systems," *Proceedings of the 1986 Princeton Conference on Information Sciences and Systems*, pp. 711–716, Princeton, New Jersey, March 1986.

R. L. Stevenson and G. R. Arce, "Theoretical Analysis of Morphological Filters," *Proceedings of the 24th Annual Allerton Conference on Communication, Control, and Computing*, pp. 353–362, Allerton, IL, October 1986.

R. L. Stevenson and E. J. Delp, "Investigation into Building an Invariant Surface Model from Sparse Data," *NATO ASI on Active Perception and Robot Vision*, Maratea, Italy, July 16–29, 1989.

R. L. Stevenson, "Machine Vision Systems for Component Assembly and Measurements," *Proceedings of the Fluid Power Technical Update Seminar*, pp. 98–107, West Lafayette, IN, August 2–4, 1989.

J. Song, **R. L. Stevenson**, and E. J. Delp, "The Use of Mathematical Morphology in Image Enhancement," *Proceedings of the 32nd Midwest Symposium on Circuits and Systems*, pp. 67–70, Urbana, IL, August 14–16, 1989.

R. L. Stevenson and E. J. Delp, "Invariant Reconstruction of Visual Surfaces," *Proceedings of the IEEE Workshop on the Interpretation of 3D Scenes*, pp. 131–137, Austin, TX, November 27–29, 1989.

R. L. Stevenson and E. J. Delp, "Fitting Curves with Discontinuities," *Proceedings of the IEEE International Workshop on Robust Computer Vision*, pp. 127–136, Seattle, WA, October 1–3, 1990.

R. L. Stevenson, G. B. Adams, L. H. Jamieson and E. J. Delp, "Three–Dimensional Surface Reconstruction on the AT&T Pixel Machine," *Proceedings of the 24th Annual Asilomar Conference on Signals,*

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Systems and Computers, pp. 544–548, Pacific Grove, CA, November 5–7, 1990.

R. L. Stevenson and E. J. Delp, "Invariant Reconstruction of 3D Curves and Surfaces," *Proceedings of the SPIE Conference on Intelligent Robots and Computer Vision*, pp. 364–375, Boston, MA, November 4–9, 1990.

R. L. Stevenson and E. J. Delp, "Viewpoint Invariant Recovery of Visual Surfaces from Sparse Data," *Proceedings of the Third International Conference on Computer Vision*, pp. 309–312, Osaka, Japan, December 4–7, 1990.

R. L. Stevenson and E. J. Delp, "Surface Reconstruction with Discontinuities," *Proceedings of the SPIE Conference on Curves and Surfaces in Computer Vision and Graphics II*, pp. 46-57, Boston, MA, November 10–15, 1991.

R. L. Stevenson, "A Nonlinear Estimation Technique for Filtering Images Corrupted with Gaussian Noise," *Proceedings of the SPIE/IS&T Conference on Nonlinear Image Processing III*, pp. 210–221, San Jose, California, February 9–14, 1992.

R. R. Schultz and **R. L. Stevenson**, "Improved Definition Image Expansion," *Proceedings of the 1992 International Conference on Acoustics, Speech and Signal Processing*, pp. III:173–176, San Francisco, California, March 23–26, 1992.

J. Wang, **R. L. Stevenson**, and Richard R. Schultz, "Recovery of Image Information from Halftone Information," *Proceedings of the Fifth Digital Signal Processing Workshop,* pp. 6.3.1–6.3.2, Starved Rock State Park, IL, September 13–16, 1992.

R. R. Schultz and **R. L. Stevenson**, "Parameter Estimation for Discontinuity– Preserving Stochastic Signal Models," *Proceedings of the Thirtieth Annual Allerton Conference on Communication, Control, and Computing*, pp. 319–328, Allerton, IL, September 30 – October 2, 1992.

S. M. Schweizer and **R. L. Stevenson**, "Predetection of Impulse Locations in a Mixed Noise Environment," *Proceedings of the Third Annual Argonne Symposium for Undergraduates in Science, Engineering*

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and Mathematics, p. 73, Argonne National Laboratory, Argonne, IL, November 6–7, 1992.

S. M. Schweizer and **R. L. Stevenson**, "A Bayesian Approach to Inverse Halftoning," *Proceedings of the SPIE/IS&T Conference on Human Vision, Visual Processing and Digital Display IV,* pp. 282–292, San Jose, CA, January 31 – February 5, 1993.

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"Stochastic Modeling for Image/Video Processing," Purdue University, West Lafayette, IN, Nov. 12, 1998.

"High Performance Multimedia Applications Reserach," Sun Microsystems, Sunnyvale, CA, Jan. 25, 1999.

"Video over the Internet," D. E. Shaw & Co., New York, NY, May 4, 2000.

"Entertainment Video over the Internet," Sun Microsystems, Sunnyvale, CA, Nov. 16, 2000.

"The Creative Scientist," Keynote address at 16th Annual Undergraduate Research Symposium, University of Delaware, Newark, DE, May 5, 2001.

"Super-Resolution Camera Systems," Thomson Consumer Electronics, Indianapolis, IN, November 28, 2001.

"Three-Dimensional Signal Processing," Air Force Research Laboratory, Rome, New York, September 26, 2002.

"Bayesian Image and Video Restoration," ECE Distinguished Speaker Seminar Series at the Illinois Institute of Technology, October 24, 2003.

"Error Resilient Video Coding," Purdue University, West Lafayette, IN, May 17, 2005.

"Robust Video Compression Using Multiple Description Coding," Indiana University-Purdue University Indianapolis, Indianapolis, IN, November 2, 2006.

"Bayesian-Based Image and Video Enhancement," Digimarc Corporation, Beaverton, OR, July 27, 2011.

Dissertations/Theses Supervised

Ph.D. Dissertations

R. R. Schultz, "Multichannel Stochastic Image Models: Theory, Applications, and Implementations," Ph.D. Dissertation, University of Notre Dame, November 1994.

T. P. O'Rourke, "Robust Image Communication: An Improved Design," Ph.D. Dissertation, University of Notre Dame, January 1996.

B. E. Schmitz, "Enhancement of Sub-Sampled Color Image Data," Ph.D. Dissertation, University of Notre Dame, March 1996.

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R. Llados-Bernaus, "Entropy Coding Techniques for Robust Video Compression," Ph.D. Dissertation, University of Notre Dame, March 1998.

M. A. Robertson, "High-Quality Reconstruction of Digital Image and Video from Imperfect Observations," Ph.D. Dissertation, University of Notre Dame, April 2001.

R. Magill, "Emulating an Output Queued Packet Switch with Systems Containing Input and Output Queueing," Ph.D. Dissertation, University of Notre Dame, May 2003.

K. Erickson, "Quality Optimization of Standards - Compliant Encoded Video," Ph.D. Dissertation, University of Notre Dame, May 2003.

S. Borman, "Topics in Multiframe Superresolution Restoration," Ph.D. Dissertation, University of Notre Dame, May 2004.

G. Zhang, "Robust Scalable Video Compression Using Multiple Description Coding," Ph.D. Dissertation, University of Notre Dame, May 2007.

J. Gai, "Robust Target Tracking: Theory, Applications and Implementations," Ph.D. Dissertation, University of Notre Dame, May 2010.

Y. Li, "Multimodal Image Registration Through Iteratively Searching Correspondences of Keypoints and Line Segments," Ph.D. Dissertation, University of Notre Dame, December 2012.

J. Simpkins, "Modeling, Approximation, and Estimation of Spatially-Varying Blur in Photographic Systems," Ph.D. Dissertation, University of Notre Dame, May 2016.

L. Hollmann, "Modeling, Approximation, and Estimation of Spatially-Varying Blur in Photographic Systems," Ph.D. Dissertation, University of Notre Dame, November 2016.

R. Zhen, "Aided Blind Deblurring Image Degraded by Motion Blur," Ph.D. Dissertation, University of Notre Dame, February 2017.

S. Zhang, "Deep Image Deblurring Networks Aided by Auxiliary Information," Ph.D. Dissertation, University of Notre Dame, August 2021.

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J. Li, "Information Fusion for Machine Perception in Challenging Environments," Ph.D. Dissertation, University of Notre Dame, May 2023.

M. Izadi, "Audio Representation Learning with Deep Neural Networks," Ph.D. Dissertation, University of Notre Dame, December 2023.

M.S.E.E. Theses

R. R. Schultz, "Improved Definition Image Expansion," M.S.E.E. Thesis, University of Notre Dame, January 1992.

T. P. O'Rourke, "Human Visual Based Wavelet Decomposition for Image Compression," M.S.E.E. Thesis, University of Notre Dame, December 1992.

B. E. Schmitz, "Curve Reconstruction: A Balance Between Smoothness and Discontinuity Preservation," M.S.E.E. Thesis, University of Notre Dame, February 1993.

H. M. Zayed, "A Tunable Analog VLSI Network for Preserving Discontinuities in One-Dimensional Signals," M.S.E.E Thesis, University of Notre Dame, November 1993 (co-adviser: G. Bernstein).

M. J. Wahoske, "Dual-Receiver Blind Identification for Image Blurs," M.S.E.E Thesis, University of Notre Dame, August 1996 (co-adviser: R. Liu).

M. Robertson, "Computationally Efficient Post-Processing of Compressed Video Streams," M.S.E.E Thesis, University of Notre Dame, February 1998.

G. Zhang, "Modified Fixed-Length Entropy Coding for Robust Video Compression," M.S.E.E Thesis, University of Notre Dame, December 2002.

J. D. Simpkins, "Modeling and Estimation of Spatially-Varying Point-Spread Functions Due to Lens Aberrations and Defocus," M.S.E.E. Thesis, University of Notre Dame, December 2011.

R. Zhen, "Enhanced Raw Image Capture and Deblurring," M.S.E.E. Thesis, University of Notre Dame, May 2013.

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Research Funding

Current Funding

Principal Investigator, EE Chair Fund, $575,000 for "Video Enhancement Research."

Prior Funding

Principal Investigator, Jesse H. Jones Faculty Research Fund, University of Notre Dame, $9,750 for "Reliable Surface Parameter Estimation in Three–Dimensional Vision," (with P. Flynn).

Principal Investigator, Jesse H. Jones Faculty Research Equipment Fund, University of Notre Dame, $7,675 for "Hardware for the Acquisition and Display of Real–Time Video Signals," (with K. Sauer).

Co-Principal Investigator, Rome Laboratory, F30602-92-C-0138, $85,000 for "Multi-Frame Integration," (with Y. Huang and R. Liu).

Co-Principal Investigator, National Science Foundation, CDA92-22905, $58,126 for a "High Resolution Video Processing System," (with D. Costello, K. Sauer, P. Bauer, Y. Huang and R. Liu).

Principal Investigator, Indiana Space Grant Consortium, $7,300 for "Real–Time Vision for Teleoperated Control of Unmanned Vehicles and Robots," $7,500 for "Robust Video Coding," $5,889 for "Robust Video Coding,"

Principal Investigator, Apple Computer, Inc., $15,000 for "Color Palette Restoration," $16,467 equipment donation.

Co-Principal Investigator, Office of University Computing, University of Notre Dame, $20,000 for "Computing for System Engineering," (with D. Costello and A. Lumsdaine).

Co-Principal Investigator, National Aeronautics and Space Administration, NASA-NAG 3-1549, $50,795 for "Integrated System Design for the Transmission of Image Data over Low Bit Rate Noisy Channels," (with D. Costello and Y. Huang).

Principal Investigator, Rome Laboratory, F30602-94-1-0017, $35,408 for "Multi-Frame Integration for the Extraction of High Resolution

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Still Images from Video Sequences."

Principal Investigator, Rome Laboratory, F30602-94-1-0016, $50,785 for "Parallel and Distributed Algorithms for High-Speed Image Processing," (with A. Lumsdaine).

Principal Investigator, Intel Corp., $68,000 for "Post-Processing Compressed Video Data," $15,000 equipment donation.

Co-Principal Investigator, Lockheed Martin, $150,000 for "Robust Transmission of Images over Noisy Channels," (with D. Costello and Y. Huang).

Principal Investigator, Apple Computer, Inc., $19,100 for "Quicktake Image Enhancement," $15,000 equipment donation.

Co-Principal Investigator, Office of University Computing, University of Notre Dame, $21,600 for "Multidisciplinary Engineering Design Laboratory," (with J. Brockman, J. Kantor, J. Renaud, D. Kirkner, S. Batill, and P. Kogge).

Principal Investigator, Motorola Corp., $91,252 for "Robust Transmission of Image Data over Low-Bit-Rate Noisy Channels," (with D. Costello, R. Liu and Y. Huang).

Principal Investigator, Rome Laboratory, F30602-96-C-0235, $199,964 for "Parallel and Distributed Algorithms for High-Speed Image Processing," (with A. Lumsdaine).

Co-Principal Investigator, Office of University Computing, University of Notre Dame, $23,000 for "An ATM Network for High-Speed Communications," (with A. Lumsdaine).

Principal Investigator, Sun Microsystems, $21,400 for "VIS-Based Image Enhancement."

Co-Principal Investigator, IBM, $309,544 for "Scalable Shared Memory: Case Studies," (with A. Lumsdaine, N. Chrisochoides, J. Westerink, E. Maginn, M. Stadtherr).

Co-Principal Investigator, Army Research Office, DAAG55-98-1-0091, $250,000 for "Scalable Meta-Computing for Computational Science and Engineering," with A. Lumsdaine, N. Chrisochoides, J. Westerink, E.

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Maginn, M. Stadtherr).

Principal Investigator, Graduate School, University of Notre Dame, $71,980 for "High-Resolution Video Processing,".

Principal Investigator, Department of Defense, MDA904-98-C-B224, $124,150 for "Temporal Image Enhancement," (with A. Lumsdaine).

Co-Principal Investigator, Graduate School, University of Notre Dame, $215,000 for "Scalable Meta-Computing for High Performance Computational Science and Engineering," (with A. Lumsdaine, N. Chrisochoides, J. Westerink, E. Maginn, M. Stadtherr).

Principal Investigator, Sun Microsystems, $55,060 for "Multimedia Architectures."

Principal Investigator, Graduate School, University of Notre Dame, $75,000 for "Sun Microsystems Embedded Center."

Co-Principal Investigator, Indiana's 21st Century Research & Technology Fund, $829,714 for "Entertainment Video over the Internet," (with E. Delp, B. Beyers, C. Rosenberg, P. Salama, and N. Shroff).

Principal Investigator, Sun Microsystems, $40,000 for "Entertainment Video."

Co-Principal Investigator, National Science Foundation, $248,887 for "Instrumentation for Multidimensional Imaging and Applications", (P. Flynn, K. Bowyer, and D.Z. Chen).

Principal Investigator, Department of the Air Force, $75,000 for "Multi-Source Image Correlation and Analysis," (with P. Flynn, and K. Bowyer).

Co-Principal Investigator, Indiana's 21st Century Research & Technology Fund, $856,576 for "Advanced Digital Video Compression: New Techniques for Security Applications," (with E. Delp, L. Chrisopher, B. Brenner, C. Armstrong, and P. Salama).

Principal Investigator, Office of Naval Research, $39,461 for "Biologically Inspired Approaches to Overcome Mutual-Interference by Active Sensor Systems."

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Principal Investigator, Office of Naval Research, $54,073 for "Signal Processing Methods to Isolate Individual Bat FM calls from within the noise of a swarm."

Teaching and Course Development

EE220	Devices and Systems in Electrical Engineering Developed: Fall 1998 Taught: Fall 1998, 1999, 2000
EE224/EE20224	Introduction to Electrical Engineering Taught: Fall 1990, 1992, 1995, 1999, 2000, 2006, 2007, 2008
EE242/EE20242	Electronic Circuits Taught: Spring 2001, 2002, 2003, 2004, 2005
EE30363	Random Phenomena in Electrical Engineering Taught: Spring 2010, 2011, 2012, 2013
EE20231	Digital Systems Developed: Spring 2023 Taught: Spring 2023, 2024, Summer 2023
EE30321	Embedded Systems Developed: Spring 2016 Taught: Spring 2016, 2017, 2018, 2019, 2020, 2021, 2022
EE30025/40354	Multimedia Signals and Systems Developed: Fall 2012 Taught: Fall 2012, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023; Spring 2014
EE471/EE40471	Digital Signal Processing Taught: Spring 1992, 1993, 1995, 1996, 2000, 2008
EG498	Multidisciplinary Engineering Design Laboratory Developed: Fall 1995 Taught: Fall 1995
EE498	Topics in Image Processing Taught: Fall 1994
EE573/EE60573	Random Processing, Estimation and Detection Theory Taught: Spring 2007, 2009
EE581/EE60581	Digital Image Processing

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	Taught: Spring 1991, 1994, 1999, 2006, 2015; Fall 1997, 2001, 2003, 2010
EE598/EE60671	Advanced Digital Signal Processing Developed: Fall 2004 Taught: Fall 2004, 2005, 2011, 2013, 2014
EE598	Computer Vision Developed: Fall 1991 Taught: Fall 1991, 1993
EE663/EE80663	Advanced Stochastic Processes Developed: Spring 1998 Taught: Spring 1998, Fall 2002, 2009
ELEG631	Applications of Digital Signal Processing Developed: Fall 1996 Taught: Fall 1996, University of Delaware
CSE498P	Digital Multimedia Hub System Design Developed: Spring 2003 Taught: Spring 2003

University Services

University

Chair, Science and Technology Subcommittee of the Core Curriculum Committee
2018–2022

Core Curriculum Committee
2018–2022

Club Supervisor, Notre Dame Machine Learning Club
2018–2023

Committee on Advising
2018–2019

Club Supervisor, Rubik's Cube Club of Notre Dame
2011–2015

University Committee on Research and Sponsored Programs
2006–2010

Intellectual Property Committee
2003–2006

ND's Technical Liaison to the Indiana Governor for Sun Microsystems
2000–2001

Committee on Technical Computing

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1995–1996
University Committee on Computer and Information Sciences
1995–1996, 2002–2003
University Committee on Academic Technology
2003–2006
Faculty Senate
1993–1996
Freshman Orientation
1993–1995, 1998–2007, 2021-Present
Ad-hoc College of Engineering and Science DUS Committee 2022

Engineering College
Undergraduate Curriculum Committee
2021–Present
Ad-hoc Committee on First Year Engineering
2018–2019
Four Horsemen Venture Capital Fund Advisory Committee
2003–2004
CSE Chairman Search Committee
1999–2001
College Council
1997–2000
Undergraduate Studies Committee
1994–1996, 1998–1999, 2013–Present
College Computer Committee
1995–1996, 1997–2013
Ad hoc College Computer Committee
2001–2002, 2007
Friends of the MEP mentoring initiative
1992

Electrical Engineering Department
Ad-hoc Committee on the Curriculum
2017–2022
Director of Undergraduate Studies
2014–Present
ABET Coordinator
2016–2017, 2022–2023
Committee on Appointments and Promotions
2007–2009, 2017–Present
Area Committee Chairman
2002–2013

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Graduate Committee
1991–1994, 2003–2005, 2006–2008, 2010–2012
Undergraduate Committee
1994–1996, 1998–2000, 2001–2003, 2005–2007, 2011–Present
Undergraduate Coordinator
1994–1996, 1998–1999
Undergraduate Mentor
2006–2014
Qualifying Exam Coordinator
1991–1993
Computer Committee, Chair
1994–1996, 1997–2013
Electrical Engineering Commencement Coordinator
2002, 2013–Present
Graduate Admissions Committee
1997–1998, 2008, 2013
Facilities Committee
1997-1998
Honesty Committee
1993–1994
Eta Kappa Nu Faculty Advisor
1991–1996

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