C. Richard Johnson, Jr.

DEGREES

1977 :: Ph.D.E.E. (Electrical Engineering) with minors in Engineering-Economic Systems and Art History, Stanford University, Stanford, CA.

1975 :: M.S.E.E., Stanford University, Stanford, CA.

1973 :: B.E.E. with high honors, Georgia Institute of Technology, Atlanta, GA.

ACADEMIC/RESEARCH APPOINTMENTS

2016 - present :: Jacobs Fellow in Computational Arts and Humanities, Jacobs Technion-Cornell Institute, Cornell Tech, New York, NY

2016 - present :: Visiting Research Scholar, Conservation Center of the Institute of Fine Arts, New York University, New York, NY

2013 - present :: Computational Art History Advisor, RKD - Netherlands Institute for Art History, the Hague, the Netherlands

2013 - present :: Scientific Researcher, Rijksmuseum, Amsterdam, the Netherlands

2008 - present :: Geoffrey S. M. Hedrick Senior Professor of Engineering, Cornell University, Ithaca, NY

2007 - 11 :: Adjunct Research Fellow, Van Gogh Museum, Amsterdam, the Netherlands

1987 - present :: Professor, Electrical and Computer Engineering, Cornell University, Ithaca, NY

1981 - 87 :: Associate Professor, Electrical Engineering, Cornell University, Ithaca, NY

1977 - 81 :: Assistant Professor, Electrical Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA

ADMINISTRATIVE APPOINTMENTS

2016 - present :: Director, PhD Program, Cornell Tech, New York, NY

1988 -91 :: Associate Director, School of Electrical Engineering, Cornell University, Ithaca, NY

PROFESSIONAL HONORS

2005 :: Selected a Fulbright Research Scholar to Conservatoire National des Arts et Métiers (Paris, France) on "adaptive signal processing algorithms and communication systems applications"

2004 :: Designated a Stephen H. Weiss Presidential Fellow of Cornell University "for effective, inspiring, and distinguished teaching of undergraduate students and for outstanding contributions to undergraduate education"

1991 :: Selected a Distinguished Lecturer of the Signal Processing Society of the Institute of Electrical and Electronics Engineers (IEEE)

1989 :: Elected a Fellow of the IEEE "for contributions to adaptive parameter estimation theory with applications in digital control and signal processing".

1983 :: Selected the (Eta Kappa Nu) C. Holmes MacDonald Outstanding (Young Electrical Engineering) Teacher [national award]

1982 :: Selected the Eta Kappa Nu Outstanding Young Electrical Engineer [national award] for "his outstanding contributions to the field of control technology, his cultural achievements, and his involvement in professional activities"

1982 :: Received a Senior (Best Paper) Award from the IEEE Acoustics, Speech, and Signal Processing Society for "SHARF Convergence Properties" (appearing June 1981 in the *IEEE Transactions on Acoustics, Speech, and Signal Processing* and co-authored with M. G. Larimore, J. R. Treichler, and B. D. O. Anderson)

RECENT TEACHING

Digital feedback control (Senior level), Art support analysis algorithms (Senior level), Applications of one- and two-dimensional signal processing (Masters level), and Applications of adaptive signal processing (Masters level)

PRIMARY RESEARCH INTERESTS

1977-1991: Adaptive Feedback Systems Theory; 1991-2005: Blind Equalization in Digital Communication Receivers; 2005-present: Signal Processing in Computational Art History

BOOKS AND SELECTED BOOK CHAPTERS

- D. H. Johnson, C. R. Johnson, Jr., and E. Hendriks, "Automated Thread Counting" in *Van Gogh's Studio Practice*, M. Vellekoop, M. Geldof, E. Hendriks, L. Jansen, and A. de Tagle, editors, pp. 142-155, Mercatorfonds, 2013.

- E. Hendriks, C. R. Johnson, Jr., D. H. Johnson, and M. Geldof, "Automated Thread Counting and the Studio Practice Project" in *Van Gogh's Studio Practice*, M. Vellekoop, M. Geldof, E. Hendriks, L. Jansen, and A. de Tagle, editors, pp. 156-181, Mercatorfonds, 2013.

- C. R. Johnson, Jr., W. A. Sethares, and A. G. Klein, *Software Receiver Design: Build Your Own Digital Communication System in Five Easy Steps*, Cambridge University Press, 2011 (revision of Johnson and Sethares, *Telecommunication Breakdown: Concepts of Communication Transmitted via Software-Defined Radio*, Prentice Hall, 2004).

- J. R. Treichler, C. R. Johnson, Jr., and M. G. Larimore, *Theory and Design of Adaptive Filters*, Prentice-Hall 2001 (revision of Treichler, Johnson, and Larimore, *Theory and Design of Adaptive Filters*, Wiley/Interscience, 1987).

- C. R. Johnson, Jr., P. Schniter, I. Fijalkow, L. Tong, J. D. Behm, M. G. Larimore, D. R. Brown, R. A. Casas, T. J. Endres, S. Lambotharan, A. Touzni, H. H. Zeng, M. Green, and J. R. Treichler, "The Core of FSE-CMA Behavior Theory" in *Unsupervised Adaptive Filtering, vol. II: Blind Deconvolution*, Simon Haykin, editor, pp. 13-112, Wiley, 2000.

- C. R. Johnson, Jr., *Lectures on Adaptive Parameter Estimation*, Prentice Hall, 1988.

- B. D. O. Anderson, R. R. Bitmead, C. R. Johnson, Jr., P. V. Kokotovic, R. L. Kosut, I. M. Y. Mareels, L. Praly, and B. D. Riedle, *Stability of Adaptive Systems: Passivity and Averaging Analysis*, MIT Press, 1986.

SELECTED JOURNAL PUBLICATIONS

- C. R. Johnson, Jr. and W. A. Sethares, "Canvas Weave Match Supports Designation of Vermeer's *Geographer* and *Astronomer* as a Pendant Pair," *Journal of Historians of Netherlandish Art* (Special issue for Walter Liedtke), vol. 9, issue 1, Winter 2017. (DOI: 10.5092/jhna.2017.9.1.17)

- C. R. Johnson, Jr., W. A. Sethares, M. H. Ellis, and S. Haqqi, "Hunting for Paper Moldmates Among Rembrandt's Prints," *IEEE Signal Processing Magazine* (Special Section - Signal Processing for Art Investigation), vol. 32, pp. 28-37, July 2015.

- P. Doing and C. R. Johnson, Jr., " On Applying Signal Processing to Computational Art History: An Interview," *International Journal for Digital Art History*, issue 1, pp. 64-75, 2015.

- C. R. Johnson, Jr., P. Messier, W. A. Sethares, A. G. Klein, C. Brown, A. H. Do, P. Klausmeyer, P. Abry, S. Jaffard, H. Wendt, S. Roux, N. Pustelnik, N. van Noord, L. van der Matten, E. Postma, J. Coddington, L. A. Daffner, H. Murata, H. Wilhelm, S. Wood, and M. Messier, "Pursuing Automated Classification of Historic Photographic Papers from Raking Light Images," *Journal of the American Institute for Conservation*, vol. 53, no. 3, pp. 159-170, 2014.

- C. R. Johnson, Jr., D. H. Johnson, I. Verslype, R. Lugtigheid, and R. G. Erdmann, "Detecting Weft Snakes," *Art Matters*, vol. 5, pp. 48-52, 2013.

- D. H. Johnson, E. Hendriks, and C. R. Johnson, Jr., "Interpreting Canvas Weave Matches," *Art Matters*, vol. 5, pp. 53-61, 2013.

- D. H. Johnson, C. R. Johnson, Jr., and R. G. Erdmann, "Weave Analysis of Paintings on Canvas from Radiographs," *Signal Processing* (Special Issue on Image Processing for Art Investigation), vol. 93, pp. 527-540, March 2013.

- W. Liedtke, C. R. Johnson, Jr., and D. H. Johnson, "Canvas Matches in Vermeer: A Case Study in the Computer Analysis of Fabric Supports," *Metropolitan Museum Journal*, vol. 47, pp. 99-106, 2012.

- P. Pérez d'Ors, C. R. Johnson, Jr., and D. H. Johnson, "Velázquez in Fraga: a New Hypothesis about the Portraits of El Primo and Philip IV," *The Burlington Magazine*, vol. CLIV, pp. 620-625, September 2012.

- L. van Tilborgh, T. Meedendorp, E. Hendriks, D. H. Johnson, C. R. Johnson, Jr., and R. G. Erdmann, "Weave Matching and Dating of Van Gogh's Paintings: An Interdisciplinary Approach," *The Burlington Magazine*, vol. 153, pp. 112-122, February 2012.

- C. R. Johnson, Jr., D. H. Johnson, N. Hamashima, H. S. Yang, and E. Hendriks, "On the Utility of Spectral-Maximum-Based Automated Thread Counting from X-Rays of Paintings on Canvas," *Studies in Conservation*, vol. 56, no. 2, pp. 104-114, 2011.

- C. R. Johnson, Jr., E. Hendriks, I. J. Berezhnoy, E. Brevdo, S. M. Hughes, I. Daubechies, J. Li, E. Postma, and J. Z. Wang, "Image Processing for Artist Identification: Computerized Analysis of Vincent van Gogh's Painting Brushstrokes," *IEEE Signal Processing Magazine* (Special Section - Signal Processing in Visual Cultural Heritage), vol. 25, pp. 37-48, July 2008.

- J. Balakrishnan, R. K. Martin, and C. R. Johnson, Jr., "Blind, Adaptive Channel Shortening by Sum-Squared Auto-Correlation Minimization (SAM)," *IEEE Trans. on Signal Processing*, vol. 51, pp. 3086-3093, December 2003.

- R. K. Martin, J. Balakrishnan, W. A. Sethares, and C. R. Johnson, Jr., "A Blind, Adaptive TEQ for Multicarrier Systems," *IEEE Signal Processing Letters*, vol. 9, pp. 341-343, November 2002.

- C. R. Johnson, Jr., P. Schniter, T. J. Endres, J. D. Behm, D. R. Brown, and R. A. Casas, "Blind Equalization Using the Constant Modulus Criterion: A Review," *Proc. IEEE* (Special Issue on Blind System Identification and Estimation), vol. 86, pp. 1927-1950, October 1998.

- J. R. Treichler, I. Fijalkow, and C. R. Johnson, Jr., "Fractionally Spaced Equalizers: How Long Should They Really Be?," *IEEE Signal Processing Magazine*, vol. 13, pp. 65-81, May 1996.

- Z. Ding, R. A. Kennedy, B. D. O. Anderson, and C. R. Johnson, Jr., "Ill-Convergence of Godard Blind Equalizers in Data Communication Systems," *IEEE Trans. on Communications*, vol. 39, pp. 1313-1327, September 1991.

- C. R. Johnson, Jr., "Adaptive IIR Filtering: Current Results and Open Issues," *IEEE Trans. on Information Theory* (Special Issue on Linear Adaptive Filtering), vol. IT-30, pp. 237-250, March 1984.

- B. D. O. Anderson and C. R. Johnson, Jr., "Exponential Convergence of Adaptive Identification and Control Algorithms," *Automatica*, vol. 18, pp. 1-13, January 1982.

- M. G. Larimore, J. R. Treichler, and C. R. Johnson, Jr., "SHARF: An Algorithm for Adapting IIR Digital Filters," *IEEE Trans. on Acoustics, Speech, and Signal Processing*, vol. ASSP-28, pp. 428-440, August 1980.

- B. Widrow, J. M. McCool, M. G. Larimore, and C. R. Johnson, Jr., "Stationary and Nonstationary Learning Characteristics of the LMS Adaptive Filter," *Proc. IEEE* (Special Issue on Adaptive Systems), vol. 64, pp. 1151-1162, August 1976.