

Karl Ricanek, Jr. Ph.D.

UNCW
Computer Science
601 South College Road
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CSC 105	Introduction to Computing and Computer Applications
CSC 121	Introduction to Computer Science I (Into to OOP w/ Java)
CSC 221	Introduction to Computer Science II (Advance OOP w/ Java)
CSC 241	Introduction to Computer Systems and Assembly Language

Instructor	NORTH CAROLINA A&T STATE UNIVERSITY	Greensboro, NC
	Department of Electrical Engineering	8/95 to 5/99

Courses Taught:

Undergraduate

ELEN 100	Numerical Methods in Engineering
ELEN 201	Introduction to Circuits Lab I
ELEN 301	Introduction to Circuits Lab II
ELEN 327	Digital Logic Lab

Graduate

ELEN 650	Digital Signal Processing I
ELEN 651	Digital Signal Processing I Lab
ELEN 750	Digital Image Processing
ELEN 751	Digital Image Processing Lab

Substitute Teacher	GUILFORD TECHNICAL COMMUNITY COLLEGE	Greensboro, NC
	Basic Skills Department	1999 to 2000
	Pre-GED Mathematics	

2.2 Industry Experience

Supervisor Process Measurement	CORNING INCORPORATED	Wilmington, NC
	Measurement Dept., Division Engineering	2001 to 2002

Led a group of advanced degree optical, mechanical, and electrical engineers to develop solutions for in process measurements. Responsible for all process measurements associated with the draw. Led international group of senior Corning engineers to address technical issues associated with manufacturing process instrumentation for optical fiber and synchronization of said instrumentation.

Member of Technical Staff	CORNING INCORPORATED	Wilmington, NC
	Project Engineering	1999 to 2001

Core work revolves around developing algorithms to increase work productivity and efficiency through non-traditional methodologies. These methodologies include vision systems, i.e., camera based/gauge based/light curtain, fuzzy controls, neural networks, and evolutionary computing. Algorithm development and implementation is performed over all process controls within Corning corporate and partnerships. Also, identification of new technologies and processes that can reduce costs associated with the Corning production environment, e.g., Agent based analysis and design for heterogeneous process environments.

Manager (Facility)	NAVAL UNDERSEA WARFARE CENTER	Newport, RI
	Advanced Interactive Media Technology Center	1995 to 1999

Technology Manager - analyze and test current/breaking technologies for insertion into the core business areas of the AIMTC facility. AIMTC core business areas are Web-based technologies, Multimedia derived technical documentation, life cycle management (product data management and knowledge data management systems), computer based authoring/training, and technical drawings.

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Business Manager - maintain current customer base and attract new customers within NUWC community, Department of Defense, and Commercially. This includes identifying new customers and markets as well as implementing quality assurance principles and practices to ensure customer satisfaction. This includes making the AIMTC facility ISO-9000/1 certified.

AIMTC IPT - responsible for coordinating and developing an Integrated Product Team (IPT) for AIMTC. The objective of the IPT is to combat the depleting Department of Defense dollars by combining forces: critical expertise, knowledge, and resources in order to produce the most cost effective solutions for the customer.

Member of
BRAC Team **NAVAL UNDERSEA WARFARE CENTER** **Newport, RI**
 Special Assignment (Base Realignment & Closure) **1994 to 1995**
Responsible for executing the disestablishment and disposition on NUWC Detachment Norfolk Code 20 functional tasks and resources.

Software
Engineer **NAVAL UNDERSEA WARFARE CENTER** **Newport, RI**
 Special Assignment (Base Realignment & Closure) **1993 to 1994**
Lead software engineering for graphics and man-machine interface for Combat System Evaluation Laboratory, which is proving ground/test bed for enhancements to combat systems for submarines. Evaluated and made recommendation for object oriented tools for department.

2.3 Industry Recognition

NUWC Special Action Award 1998
NUWC Incentive Award 1998
NUWC Special Recognition Award 1997
NUWC Special Recognition Award 1995

2.4 Department of Defense Clearance

Secret (Year of last use: 1999)

3.0 RESEARCH

3.1 Directed Thesis

Yi Chen, Department of Mathematics and Statistics, "QTL Detection from Stochastic Process by Bayesian Hierarchical Regression Model", December 2007.

Ryan Wilkins, Department of Computer Science, "Neurocognitive Inspired Hierarchical Face Recognition System, July 2007.

Kathleen Karlton, Department of Mathematics and Statistics, "Time Series Competition Among Three Sophisticated Paradigms", June 2006.

Tamirat Tesafaye, Department of Computer Science, Addis Ababa University, Addis Ababa, Ethiopia, "Impact of Face Image Currency on Recognition Rates of the Eigenface Algorithm," June 2005.

Yeusheng Zhia, Department of Mathematics and Statistics, University of North Carolina Wilmington, Wilmington, NC, "Time Series Forecasting Competition Among Three Sophisticated Paradigms," May 2005.

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3.2 Research Grant Submissions

1. Co-principle investigator, Digital Visualization and Analysis Tool, with R. Huber, L. Calhoun, D. Simmonds, National Oceanic Atmospheric Association, Amount \$289,000, February 2008. (In Review)
2. Principle Investigator/Project Director, Center for Academic Studies in Identity Sciences, with G. Dozier (NC A&T), K. Ricanek Jr. (PI), D. Woodard (Clemson), M. Savvides (CMU), Central Intelligence Agency, Amount \$2,000,000, December 2007. (In Review)
3. Co-principle investigator, Genetic Architecture of Combined Drought and Ultraviolet Radiation Stress Responses in Maize, with E. Stapleton (PD-UNCW), B. Methe (TIGR), Susan Simmons (UNCW), J. Holland (USDA ARS NCSU), USDA CSREES NRI Plant Responses to the Environment 56.0, Amount \$350,000, November 2007. (In Review)
4. Principle Investigator, 3D Representations of Craniofacial Aging, with A.M. Albert, E. Patterson, A. Sethuram Unisys Corporation, Amount \$160,000, August 2007. (Funded)
5. Principle Investigator, Craniofacial Morphology: Development of Models of Human Adult Aging, with A.M. Albert, E. Patterson, A. Sethuram Dyncorp International, Amount \$100,000, December 2007. (Funded)
6. Contributor, Genetic Architecture of Combined Drought and Ultraviolet Radiation Stress Responses in Maize, with E. Stapleton (PD-UNCW), L. McIntyre (University of Florida), Susan Simmons (UNCW), J. Holland (USDA ARS NCSU) USDA CSREES NRI Plant Responses to the Environment 56.0, Amount \$350,000, December 2006. (Unfunded)
7. Co-principle investigator, North Carolina Upward Bound Math Science, with Bowling (ASU-PD) et al Department of Education Upward Bound Math Science, Amount \$250,000, October 2006. (Unfunded)
8. Co-principle investigator, Virtual Studies of the Past, with T. Burgh, NEH Grants for Teaching and Learning Resources and Curriculum Development, Amount \$130,000, October 2005. (Unfunded)
9. Co-principle investigator, Virtual Studies of the Past, with T. Burgh and S. Baptista, ITSD Innovations Grant, Amount \$2,500, January 2005. (Funded)
10. K. Ricanek, CAS Travel Award, Amount \$1,500, Summer 2005. (Funded)
11. K. Ricanek, International Travel Award-International Program Committee, UNCW, Amount \$2,000, Summer 2005. (Funded)
12. K. Ricanek, International Travel Award-International Program Committee, UNCW, Amount \$1,500, Summer 2004. (Funded)
13. Co-principle investigator, A Set of Web Services to Improve Information Technology Fluency, with R. Vetter (UNCW CSC), T. Janicki (UNCW ISON), D. Kline (UNCW ISOM), J. Brown, and B. Heath, NSF CCLI 2004, NSF Proposal No. 0442325, Submitted June 2004. (Unfunded)
14. K. Ricanek, Student Assistance Grant, CTE, UNCW, Amount \$720, Fall 2004. (Funded).

3.3 Industry Collaboration/Consulting

"Optical Signal Analysis and Classification for Optical Time Domain Reflectometry", collaboration with Corning Inc., Optical Fiber Division, Wilmington NC.

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"Precision Machine Vision Based Metrology for Inspection of Optically Pure Glass Cylinders", is consulting for Corning, Inc. Optical Fiber Division, Wilmington NC.

3.4 Past Research

- Wavelet Analysis/De-noising of Polarization Optical Time Domain Reflectometry
- Ultra high precision diameter measurement of optical transparent glass cylinders (7.0" cylinders with .002" accuracy) with digital camera technology
- Small package precision bubble detection using COTS photo-electronics achieving 4x improvement of tube-diameter-to-bubble-size over conventional ultrasonic detectors
- Target recognition systems using optimized neural networks
- Face recognition systems using hybrid Hopfield neural networks
- Geological positioning and guidance system for Mars Rovers
- Multi-resolution image compression using wavelets

3.5 Publications

Technical Reports & White Papers

1. E.K. Patterson, K. Ricanek, and A.M. Albert, "Models and Techniques for Facial Aging of Digital Images of Adults," Dyncorp International Technical Report, March 2006.
2. A.M. Albert, K. Ricanek, and E.K. Patterson, "The Aging Adult Skull and Face: A Critical Update to the Review of the Literature on Factors and Processes of Change Focusing on Interaction Between Bodyweight, Facial Fat, and Aging," Dyncorp International Technical Report, April 2006.
3. K. Ricanek, E.K. Patterson, and A.M. Albert, "Age-Related Morphological Changes: Effects on Facial Recognition Technologies," UNCW Technical Report, CALL #WRG FSC-\$, 2004.

A.M. Albert, K. Ricanek, and E.K. Patterson, "The Aging Adult Skull and Face: A Review of the Literature and Report on Factors and Processes of Change," UNCW Internal Technical Report, UNCW Technical Report, CALL #WRG FSC-A, 2004.

4. M. Albert, K. Ricanek, and E. Patterson, "The Aging Adult Skull and Face: A Review of the Literature and Report on Factors and Processes of Change", Technical Report, Dyncorp, July 2004.
5. K. Ricanek, E. Patterson, and M. Albert, "Age Related Morphological Changes: Effects on Facial Recognition Technologies", White Paper for Dept. of Defense, July 2003.
6. K. Ricanek and J. Meacham, "Coating Vision System", Invention Disclosure, Oct 2002.
7. K. Ricanek, "Comparative Analysis of Draw Tension Instrumentation", White Paper, Corning, Inc. 2000.

Referred Articles

1. C. Pearson, S. Simmons, K. Ricanek, and E. Boone, "Comparative Analysis of a Hierarchical Bayesian Method for Quantitative Trait Loci Analysis for the Arabidopsis Thaliana", *Pattern Recognition in Bioinformatics, Second IAPR International Workshop*, October 2007.

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2. E. Patterson, A. Sethuram, M. Albert, K. Ricanek, and M. King, "Aspects of Age Variation in Facial Morphology Affecting Biometrics," *Proceedings of the IEEE Conference on Biometrics: Theory, Applications, and Systems*, Washington, D.C., September, 2007.

E. Patterson, A. Sethuram, M. Albert, and K. Ricanek, "Comparison of Synthetic Face Aging to Age Progression by Forensic Sketch Artist," *Proceedings of the Seventh IASTED International Conference on Visualization, Imaging, and Image Processing*, ACTA Press, pages 247-252, Palma de Mallorca, Spain, August, 2007.
3. K. Ricanek, R.B. Wilkins, A. Sethuram, and E. Patterson, "A Novel Cognitive-Psychology Based Face Recognition System for Improved Identification Rates for the Problem of Age-Progression" *Proceedings of the Seventh IASTED International Conference on Visualization, Imaging, and Image Processing*, ACTA Press, pages 289-294, Palma de Mallorca, Spain, August, 2007.
4. E. Boone, K. Ricanek, and S. Simmons, "Quantitative Trait Loci Analysis Using a Bayesian Framework", *Proceedings of the International Joint Conference on Neural Networks*, pp 1217-1220, Orlando FL, August 12-17, 2007.
5. Midori Albert, Jr., Karl Ricanek and Eric Patterson, A review of the literature on the aging adult skull and face: Implications for forensic science research and applications, *Journal of Forensic Science International*, 16 April 2007, <http://www.sciencedirect.com/science/article/B6T6W-4NH6N87-4/2/32387a10f5d792b909910ac112f32a6c>.
6. E. Patterson, K. Ricanek, M. Albert, and E. Boone, "Automatic Representation of Adult Aging in Facial Images" *Proc. 6th IASTED International Conference on Visualization, Imaging, and Image Processing*, Palma de Mallorca, Spain, August 2006, pp 171-176.
7. K. Ricanek, E. Boone, and E. Patterson, "Craniofacial Aging on the Eigenface Biometric", *Proc. 6th International Association of Science and Technology for Development International Conference on Visualization, Imaging, and Image Processing*, Palma de Mallorca, Spain, August 2006, pp 249-253.
8. Yusheng Zhai, Kathleen Karlson, Karl Ricanek, and Edward Boone, "An Assessment of Dynamic Linear Modeling and Artificial Neural Networks Against the M3 Forecasting Competition", *Hawaiian International Conference on Statistics*, Honolulu, Hawaii, January 2006. (electronic dissemination only; no page numbers issued)
9. Karl Ricanek, Jr. and Tamirat Tesafaye, "MORPH: A Longitudinal Image Database of Normal Adult Age-Progression", *IEEE 7th International Conference on Automatic Face and Gesture Recognition*, Southampton, UK, April 2006, pp 341-345.
10. K. Ricanek and E. Boone, "The Effect of Normal Adult Aging on Standard PCA Face Recognition Accuracy Rates," *International Joint Conference on Neural Networks*, Montreal, Canada, July 2005, pp 2018-2023.
11. K. Ricanek, and E. Boone, "Landmark Based Statistical Measures for Face Recognition," *Hawaiian International Conference on Statistics*, Honolulu, Hawaii, January 2005. (electronic dissemination only; no page numbers issued)

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12. M. C. King, G. L. Lebby, K. Ricanek Jr., "Context Realization Utilizing Hierarchical Mutually Exclusive Neural Experts", SCI 2001/ISAS 2001, VOLUME XVI, *International Conference on Information Systems Analysis and Synthesis, World Multi-conference on Systemics, Cybernetics And Informatics: Concepts And Applications*, Vol. 16, July 22-25, 2001.
13. M.C. King, G.L. Lebby, and K. Ricanek, "A Dialog Control Strategy Using a Hierarchical Controller of Mutually Exclusive Neural Experts," *IASTED International Conference on Artificial Intelligence and Soft Computing*, Cancun, Mexico, 21-24 May 2001.
14. K. Ricanek and G.L. Lebby, "*Variable Lateral Pose Face Recognition using Anthropometric Analysis*", **Ph.D. Dissertation May, 1999.**
15. K. Heywood, G.L. Lebby, K. Ricanek, "Hopfield Like Networks for Pattern Recognition with Applications to Face Recognition", International Joint Conference on Neural Networks, July 10-16 1999.
16. K. Ricanek, G.L. Lebby, F.J. Ricanek, J.H. Kim, "Hybrid Hopfield Network for Pattern Recognition and Face Recognition", International Conference on Artificial Intelligence and Soft Computing, Honolulu, Hawaii, August 1999.
17. Karl Ricanek, Jung Kim, Gary L. Lebby, "Biologically Inspired Object Recognition in a Multi-context Scene," IASTED ACS, May 26, 1998.
18. Karl Ricanek, Michael Cooke, and Gary L. Lebby, "A Theory: Cellular Powered Electric Vehicle", Conference on Advances in Vehicle Control and Safety, Amiens, France, July 1, 1998.
19. K. Ricanek, A. Homaifar, G. Lebby, "Genetic Algorithm Composes Music", In Proceedings of the Twenty-Fifth Southeastern Symposium on System Theory, Tuscaloosa, AL. March 7-9, 1993, pp. 223-227.
20. K. Ricanek and G.L. Lebby, "*The development of a graphical user interface for the Automated (Power) System Planning Tool in the X Windowing environment using OSF/Motif*", **Masters of Science Thesis, Oct. 1993.**

4.0 SERVICE

4.1 Affiliations

Institute of Electrical & Electronic Engineering (IEEE) Senior Member
Association for Computing Machinery (ACM)
IEEE Educational Activities Board Biometrics
International Association for Pattern Recognition (IAPR)
American Association on Artificial Intelligence (AAAI)
International Neural Network Society (INNS)
International Association for Science and Technology Development (IASTED) *Technical Committee Neural Networks and Image Processing*
National Society of Black Engineers (NSBE)

4.2 Peer Reviewer

IEEE Transactions on Pattern Analysis and Machine Intelligence
IEEE Transactions on Neural Networks

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International Proceedings of Visualization, Imaging, and Image Processing,
International Association for Science and Technology Development.