

Eric Patterson, Ph.D.

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CURRENT RESEARCH INTERESTS

Aspects of analyzing and modeling the human face in images and three-dimensions, expression and emotion recognition and processing, audio-visual speech recognition, computer graphics and animation, digital film-making, and other computer arts.

EDUCATION

Clemson University, Clemson, SC

Ph.D., Computer Engineering, GPA: 3.86, 2002

B.S., Computer Engineering, Summa Cum Laude, GPA: 3.97, 1995

Minors: Spanish Language, Mathematical Sciences

PROFESSIONAL EXPERIENCE

Associate Professor (previously Assistant Professor)

2008-Present, 2002-2007

Department of Computer Science, University of North Carolina Wilmington

Digital Arts Coordinator, Computer Science Technical Committee Chair, Computer Science Curriculum Committee, Film Studies Advisory Committee, Film Studies Equipment Committee, Search Committees, International Programs Advisory Committee, University of North Carolina Nonpublic Post-Secondary Educational Institution License Team

Courses Offered: CSC 577: Pattern Recognition, CSC/FST 430: Digital Special Effects, CSC 421: 3D Computer Gaming, ART/CSC/FST 320: Computer Animation, ART/CSC/FST 220: Introduction to 3D Computer Graphics, FST 201: Introduction to Film Production, CSC 370: Computer Graphics Programming, CSC 112: Introduction to Programming (C++, Python), CSC 121: Introduction to Computer Science, CSC 133: Discrete Mathematical Structures, CSC 495: Seminar in Computer Science, CSC 385: Issues and Ethics in Computer Science.

Research Assistant and Graduate Teacher of Record

1995-2002

Electrical and Computer Engineering Department, Clemson University

Research Assistant in the Digital Speech Processing Lab, Fluor Daniel Engineering Innovation Building

Courses Offered: ECE 201: Digital Logic, ENGR 120: Introduction to Engineering, ECE 371 Lab: Micro-interfacing, ECE 201 Lab: Digital Logic

Instructor in Talent Identification Program, Duke University, NC

1998

Summer Instructor for course in Java programming designed for advanced students.

Consulting

Development consulting for multi-platform video effects software for Digieffects, Wilmington, NC.

2009

Network design consulting for AT&T GIS production plant, Liberty, SC.

1995

Media Production

1991-Present

Photographer, editor, director, and content producer for various film, video, and digital projects.

Spanish Translator and Migrant Caseworker

1995

Translated & performed client interviews and assessments, Beaufort County Department of Social Services, SC.

Sales Associate and Programmer, Customware Computer Center

1994

Sold, installed, and repaired network, business, and home computer products; programmed improvements to point-of-sale and inventory programs; in-store and on-site services, Beaufort, SC.

PUBLICATIONS

Patterson, E., Sethuram, A., Ricanek, K., and Bingham, F., "Improvements in Active Appearance Model Based Synthetic Age Progression for Adult Aging," Proceedings of the IEEE Conference on Biometrics: Theory, Applications, and Systems, Washington, DC, September, 2009.

Ratliff, M. and Patterson, E., "Emotion Recognition Using Facial Expressions with Active Appearance Models," Proceedings of the IASTED International Conference on Human-Computer Interface, Innsbruck, Austria, 2008.

Patterson, E., Sethuram, A., Albert, M., and Ricanek, K., "Aspects of Face Aging Concerning Biometrics," IEEE Conference on Biometrics: Theory, Applications, and Systems, Baltimore, September, 2007.

Patterson, E., Sethuram, A., Albert, M., and Ricanek, K., "Comparison of Synthetic Age Progression to Forensic Sketch Artist," Transactions of the IASTED International Conference on Visualization, Imaging, and Image Processing, Palma de Mallorca, Spain, August, 2007.

Ricanek, K., Wilkins, R., Sethuram, A., and Patterson, E., "A Novel Cognitive-Psychology-Based Face-Recognition System for Improved Identification Rates for the Problem of Age-Progressions," Proceedings of the IASTED International Conference on Visualization, Imaging, and Image Processing, Spain, 2007.

Albert, M., Ricanek, K., and Patterson, E., "A Review of the Literature on the Aging Adult Skull and Face: Implications for Forensic Science Research and Applications," Forensic Science International, October, 2007.

Tufekci, Z., Gowdy, J., Grubuz, S., and Patterson, E., "Applied Mel-Frequency Discrete Wavelet Coefficients and Parallel Model Compensation for Noise-Robust Speech Recognition," Speech Communication, Elsevier, October, 2006.

Patterson, E., Ricanek, K., Albert, M., and Boone, E., "Automatic Representation of Adult Aging in Facial Images," IASTED International Conference on Visualization, Imaging, and Image Processing, Palma de Mallorca, Spain, August, 2006.

Patterson, E. and Gowdy, J., "An Audio-Visual Approach to Simultaneous-Speaker Speech Recognition," IEEE International Conference on Acoustics, Speech, and Signal Processing, Hong Kong, April, 2003.

Gowdy, J., Patterson, E., Wu, D, and Niska, A., "Development and Use of Simulation Models for Teaching a Distance-Learning Course on Digital Processing of Speech Signals," e-Technologies in Engineering Education Conference, Switzerland, August, 2002.

Patterson, E., Gurbuz, S., Tufekci, Z., and Gowdy, J., "Moving-Talker, Speaker-Independent Feature Study and Baseline Results Using the CUAVE Multimodal Speech Corpus," EURASIP Journal on Applied Signal Processing, December, 2002.

Patterson, E. and Gowdy, J., "Experiments Using the CUAVE Audio-Visual Speech Corpus in Rotation and Scale Correction of Visual Speech Features," DARPA Workshop on Multi-Modal Speech Recognition, Greensboro, NC, June, 2002.

Patterson, E., Gurbuz, S., Tufekci, Z., and Gowdy, J., "CUAVE: A New Audio-Visual Database for Multimodal Human-Computer Interface Research," International Conference on Acoustics, Speech, and Signal Processing, Orlando, May, 2002.

Gurbuz, S., Patterson, E., Tufekci, Z. and Gowdy, J., "Lip-reading from Parametric Lip Contours for Audio-Visual Speech Recognition," *Eurospeech*, Aalborg, Denmark, 2001.

Tufekci, Z., Gowdy, J., Gurbuz, S., and Patterson, E., "Applying Parallel Model Combination with Mel-Scaled Discrete Wavelet Coefficients for Noise-Robust Speech Recognition," *Eurospeech*, Aalborg, Denmark, 2001.

Gurbuz, S., Patterson, E., Tufekci, Z., and Gowdy, J., "Affine-Invariant Visual Features Contain Supplementary Information to Enhance Speech Recognition," *International Conference on Audio-and-Visual-Based Biometric Person Authentication*, Sweden, 2001.

Patterson, E., Gurbuz, S., Tufekci, Z., and Gowdy, J., "Noise-Based Audio-Visual Fusion for Robust Speech Recognition," *International Conference on Auditory-Visual Speech Processing*, Scheelsminde, Denmark, September, 2001.

Gurbuz, S., Tufekci, Z., Patterson, E., and Gowdy, J., "Application of Affine-Invariant Fourier Descriptors to Lipreading for Audio-Visual Speech Recognition," *IEEE International Conference on Acoustics, Speech, and Signal Processing*, Salt Lake City, May 2001.

Patterson, E. and Gowdy, J., "Modeling Speech-Interfering Noise with Applied Chaos Theory," *IEEE Southeastern Conference*, March, 2001.

Patterson, E., Gowdy, J., and Wu., D., "Multi-Platform CBI Tools Using Linux and Java-Based Solutions for Distance Learning," *International Conference on Acoustics, Speech, and Signal Processing*, Seattle, May, 1998.

FUNDED PROJECTS

3D Synthesis of Facial Changes with Weight in Maya, with Ricanek, K., Department of Defense, \$50,000, 2009.

Exploitation of 3-D Craniofacial and Ocular Micro-Features for Robust 2-D Biometric Signals Against Aging and Pose Variation, Intelligence Advanced Research Project Activity, accepted, currently under negotiation.

Center for Academic Studies in Identity Sciences, with Ricanek, K. (director) and Albert, M. (UNCW portion \$334,930), also with Dozier, G. (NC A&T), Woodard, D. (Clemson), and Savvides, M. (CMU), Central Intelligence Agency, 2007-2009.

Age-Related Morphological Changes: Effects on Facial Recognition Technologies, with Ricanek, K. and Albert, M., Department of Defense, \$800,000, 2003-2007.

Digital Special Effects for Teaching and Research, with Monahan, D., UNCW Information Technology Services Division Innovations Grant, \$3,600, 2006.

3-D Digitizer Arm for Teaching and Research, with Burgh, T., UNCW Information Technology Services Division Innovations Grant, \$4,000, 2006.

Audio-Visual Speech Recognition Using Stereovision Techniques, Charles L. Cahill Award, \$2,500, 2003.

Audio-Visual Speech Recognition Using Stereovision Techniques, UNCW Summer Research Initiative, \$3,000, 2003.

Speech Recognition in Difficult Environments, NASA GSRP Fellowship, \$66,000, 1999-2001.

CREATIVE WORK

Wine-Tasting, HD short film, assistant director, various national film festivals, 2009.

Two Hours in the Dark, Super-16mm short film, production stills, various national film festivals, 2009.

Snapshot, Super-16mm short film, sound recordist, special effects, photography, production stills, various national film festivals 2005.

Sourdough, animated short film, sound and editing, 2nd Place Animation, Flicks on 66 Film Festival, 2003.

Fluffy Takes a Walk, animated short film, modeling and animation, Cucalorus Film Festival, 2003.

Coffee-Talk, HD short film, writer, director, director of photography, editor, in production.

Next-Train, animated short film, co-writer, director, in production.

PROFESSIONAL MEMBERSHIPS

Institute of Electrical and Electronics Engineers, IEEE Computer Society, IEEE Signal Processing Society

Association for Computing Machinery, ACM SIGGRAPH, ACM SIGCHI

CG Society

University Film and Video Association

AWARDS

2009 James F. Merritt Million-Dollar Club for aiding in bringing in over one million dollars in research funding.
2004-2009 Named each semester by graduating seniors as Faculty Member with Significant Impact on Undergraduate Years at UNCW

2000 Clemson University College of Engineering Outstanding Graduate Instructor

1999 Harris Outstanding Laboratory Instructor

Other honors and memberships: Tau Beta Pi, Mortar Board, Phi Kappa Phi, S.R. Rhodes ECE Senior Award, Phi Kappa Phi Outstanding Senior Award, Stanford Fellow, NASA GSRP Fellow, Brown University Writing Award.

LANGUAGES

Fluent in English and Spanish. Basic skills in French.

COMPUTER EXPERIENCE

MacOS, Unix, Linux, Windows, System Administration, C, C++, Objective-C, Python, MEL, Java, Processing, LISP, Prolog, Modula-2, Fortran, HTML/CSS, VRML, PVM, OpenGL, Matlab, HTK, Verilog HDL, TCP/IP, Maya, Zbrush, Final Cut Pro, Shake, After Effects, Photoshop, various other post-production software for editing, compositing, and match-moving, etc. for film and video, MIDI sequencing, audio-recording and design, and more.

FILM, VIDEO, AND PHOTOGRAPHY EQUIPMENT EXPERIENCE

Various motion-picture film cameras and related accessories, film loading and handling, various grip and lighting equipment, various digital and video cameras including RED One and a variety of HD and DV cameras, various digital and analog recording devices, microphones, and mixers, various still cameras including small, medium, and large-format film cameras and lenses, darkroom and processing experience, digital stills cameras of several formats, and digital processing and workflow.

OTHER SKILLS AND INTERESTS

Sailing, piano, guitar, snowboarding, skiing, mountain biking, soccer, karate, drawing, painting, auto-cross, and auto restoration.