

Dirk Colbry, Ph.D.

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AREAS OF RESEARCH INTEREST

Machine Vision, Biometrics, Robotics, Pattern Recognition, Artificial Intelligence, Cognitive Science

EDUCATION

Michigan State University, East Lansing, Michigan

2002-2006 Ph.D. in Computer Science and Engineering

- Dissertation Title: Human Face Verification by Robust 3D Surface Alignment.
- Interdepartmental Graduate Specialization in Cognitive Science.
- Dissertation Committee: Drs. George Stockman (Advisor), Anil Jain, Hayder Radha, Frank Biocca.

University of Michigan, Ann Arbor, Michigan

1999-2001 Master of Science in Engineering in Computer Science and Engineering

Georgia Institute of Technology, Atlanta, Georgia

1992-1997 Bachelor in Mechanical Engineering

RESEARCH EXPERIENCE

Arizona State University, Tempe, Arizona

2007-Present Assistant Research Professor

- Center for Cognitive Ubiquitous Computing (CUbiC).
- Research focus on pattern recognition and machine vision techniques used to develop assistive technologies.

Michigan State University, East Lansing, Michigan

2006-2007 Adjunct Faculty in Computer Science and Engineering

- Image Processing and Pattern Recognition Lab (PRIP).
- Developed a prototype, real time, 3D, frontal face recognition algorithm for commercial applications.

2006-2007 Visiting Assistant Professor in Cognitive Science

- Developing medical image feature fusion techniques between fMRI, 3D shape and color surface images.
- Explored machine vision techniques for data collection applications in zoology research.

2003-2006 NSF IGERT Research Associate

- Participated in an interdepartmental cognitive science research group studying human navigation.

University of Michigan, Ann Arbor, Michigan

2001-2003 Graduate Research Assistant

- Developed a wireless system that allowed PDA access to an advanced planning and scheduling system.
- Worked on the joint Carnegie Mellon University and University of Michigan Nursebot project, which provided intelligent robotic assistance for the elderly.
- Developed a Static/Dynamic Bayesian model in Java that was used for client plan recognition and plan execution monitoring.

2002 Summer Graduate Research Fellow

- Developed a simulator to model distributed multiagent robotic manipulators.
- Designed a distributed vision algorithm for identifying the location and orientation of packages on a distributed robotic manipulator.

TEACHING EXPERIENCE

Course Instructor

Fall 2006 Programming and mathematical concepts in MATLAB for research scientists.

PSY 992, Michigan State University

- Developed a class to teach mathematical and programming concepts to graduate research students in statistics, psychology, zoology, telecommunications and computer science.

Summer 2003 Introduction to Algorithms.

CSE 331, Michigan State University

- Accelerated nine week summer class. Three, two-hour lectures periods per week in a nine-week summer semester.

Laboratory Instructor

Spring 2003 Translation of Programming Languages.

CSE 450, Michigan State University

- Helped design project assignments and designed and presented weekly lab lectures to help students understand the material presented in class.

Fall 2002 Artificial Intelligence.

CSE 441, Michigan State University

- Designed an entirely new lab curriculum written in Java to augment the material presented in class.

1999-2000 Embedded System Design.

EECS 373, University of Michigan

- Guided students in the design of advanced embedded systems using the Xilinx FPGA and the Motorola MPC823 microprocessor.

1993-1997 Freshman Seminar.

PSY 1010, Georgia Institute of Technology

- Course designed to introduce freshman students to college life. Topics included: time management skills, study methods, university culture, interpersonal communications, leadership initiative, and major/career development.

ENGINEERING EXPERIENCE

Professional Consulting

2006-Present Cooper Tire and Rubber Company

- Consulted with Cooper Tire and Rubber company on computer vision and pattern recognition methods for tire engineering.

Winter 2007 CSTAT

- Taught a three hour class on “An Introduction to using MATLAB as a research tool” for the Michigan State University Center for Statistical Training and Consulting.

FANUC Robotics North America, Rochester Hills, Michigan

1997-1999 Robotics Engineer

- Supervised the installation of 6-7 axis robots in automotive plants, including robot assembly, programming and system design and debug.
- Extensive international travel as an on-site systems specialist focusing on projects with unique applications, new prototypes, and those requiring large-scale programming, testing and debugging.

Delta Air Lines, Atlanta, Georgia

1993-1996 Liaison Engineering, Co-op

- Authored hundreds of unique Aerospace and Mechanical Engineering reports and analyses for airline structural repairs.
- Incorporated specially designed repairs into the maintenance manual.
- Developed and Maintained database to keep track of engineering requests.

HONORS, AWARDS AND SERVICE

- Tau Beta Pi Engineering Futures Facilitator, 2006-present.
- Program Committee Member for the Workshop on Applications of Computer Vision (WACV 2008).
- Most Outstanding Graduate Student Award, selected by MSU computer science faculty, 2006.
- Graduate Student Representative to MSU Engineering College Hearing Board, 2005-2006.
- National Science Foundation IGERT Student Fellowship, 2004-2006.
- Member of Tau Beta Pi Engineering Honor Society, since 2004.
- Michigan Mars Society, Rover Design Team, Robotics Advisor, 2002-2003.
- State of Michigan Botball Advisor, 2002-2003.
- Michigan Botball Championship Judge, 2002.
- Botball National Championship Volunteer, 2001.
- IJCAI Student Merit Scholarship, 2001.
- University of Michigan Summer Research Fellowship, 2000.

INVITED TALKS AND WORKSHOPS

- Invited Talk, Arizona State University Introduction to Informatics (CPI 101) “Biometrics - Measuring and Analyzing Human Body Characteristics for Recognition,” Nov. 15, 2007.
- Invited Demonstration, Conference on Computer Vision and Pattern Recognition (CVPR) “Person Identification by 3D Surface Alignment: The 3DID Face Verification System,” June 19, 2007.
- Invited Talk, University of Notre Dame Computer Science and Engineering Seminar, “Person Verification by 3D Surface Alignment,” Feb. 27, 2007.
- Invited Talk, Wright State University Computer Science Seminar, “Live Demonstration of the 3DID System,” Feb. 2, 2007.
- Invited Talk, Freshman and Senior Seminars at Michigan State University (CSE 291 and 491), “Self evaluation using Myers-Briggs Temperament,” Oct. 20, 2006.
- Invited Participant, Face Recognition Advanced Study Workshop, Nov. 11-13, 2005.
- Invited Talk, Hope College Student Colloquium, “Analysis of 3D Face Alignment,” Oct. 13, 2005.
- Invited Talk, Tire Society Conference, “Pattern Recognition for Classification and Matching of Car Tires,” September, 2003.

PUBLICATIONS

Journal Articles

Dirk Colbry and George Stockman. The 3DID face alignment system for verifying identity. *Submitted to Image and Vision Computing*, 2008.

George Stockman, Jayson Payne, Jermil Sadler, and Dirk Colbry. Error analysis of sensor input variations in a 3D face surfacematching system. *Sensor Review Journal*, 26(2):116–121, 2006.

Xiaoguang Lu, Anil K. Jain, and Dirk Colbry. Matching 2.5D face scans to 3D models. *IEEE Transactions on PAMI*, 28(1):31–43, 2006.

Dirk Colbry, David Cherba, and John Luchini. Pattern recognition for classification and matching of car tires. *Journal of Tire Science and Technology*, 33(1):2–17, 2005.

Martha E. Pollack, Colleen E. McCarthy, Sailesh Ramakrishnan, Ioannis Tsamardinos, Laura Brown, Steve Carrion, Dirk Colbry, Cheryl Orosz, and Bart Peintner. Autominder: An intelligent cognitive orthotic system for people with memory impairment. *Robotics and Autonomous Systems*, 44(3-4):273–282, 2003.

Patents

David Zhu and Dirk Colbry. Automatic methods for combining human facial information with 3D magnetic resonance brain images. Provisional Patent Number 07161, 2007.

Conference Proceedings

David Hayden, Dirk Colbry, John A. Black Jr, and Sethuraman Panchanathan. Note-taker: Enabling students who are legally blind to take notes in class. In *Submitted to ACM SIGACCESS Conference on Computers and Accessibility*, Halifax, Canada, October 2008.

Dirk Colbry, Folarin Oki, and George Stockman. 3D face identification - experiments towards a large gallery. In *SPIE Defense and Security, Biometric Technology for Human Identification V*, volume 6944, pages 694403–1 – 694403–9, Orlando, Florida, March 2008.

Dirk Colbry and George Stockman. Canonical face depth map: A robust 3D representation for face verification. In *Proceedings of the Conference on Computer Vision and Pattern Recognition (CVPR)*, Minneapolis, Minnesota, June 2007.

Xiaoguang Lu, Dirk Colbry, and Anil K. Jain. Three-dimensional model based face recognition. In *17th International Conference on Pattern Recognition*, volume 1, pages 362–365, Cambridge, United Kingdom, August 2004. IEEE Computer Society.

Xiaoguang Lu, Dirk Colbry, and Anil K. Jain. Matching 2.5D scans for face recognition. In *International Conference on Biometric Authentication, LNCS 3072*, pages 30–36, Hong Kong, July 2004.

Dirk Colbry, Bart Peinter, and Martha E. Pollack. Execution monitoring with quantitative temporal dynamic bayesian networks. In *Sixth International Conference on AI Planning & Scheduling (AIPS-02)*, Toulouse, France, April 2002.

Martha E. Pollack, Colleen E. McCarthy, Sailesh Ramakrishnan, Ioannis Tsamardinos, Laura Brown, Steven Carrion, Dirk Colbry, Cheryl Orosz, and Bart Peintner. Autominder: A planning, monitoring, and reminding assistive agent. In *7th International Conf. on Intelligent Autonomous Systems*, Marina del Rey, California, March 2002.

Workshops and Symposiums

Narayanan C. Krishnan, Dirk Colbry, and Sethuraman Panchanathan. Real time human activity recognition using tri-axial accelerometers. In *Signal and Information Processing*, Sedona, Arizona, May 2008.

Dirk Colbry and George Stockman. Identity verification via the 3DID face alignment system. In *Proceedings of the IEEE Workshop on Applications of Computer Vision (WACV)*, Austin, Texas, Feb 2007.

Dirk Colbry, George Stockman, and Anil Jain. Detection of anchor points for 3D face verification. In *IEEE Workshop on Advanced 3D Imaging for Safety and Security A3DISS*, San Diego, California, June 2005.

Dirk Colbry, Bart Peinter, and Martha E. Pollack. Quantitative temporal relationships in dynamic bayesian models. In *AAAI Spring Symposium*, Palo Alto, California, March 2002.

Martha E. Pollack, Sandra Engberg, Sebastian Thrun, Laura Brown, Dirk Colbry, Cheryl Orosz, Bart Peintner, Sailesh Ramakrishnan, Judith T. Matthews, Jacqueline Dunbar-Jacob, Colleen E. McCarthy, Michael Montemerlo, Joelle Pineau, and Nicholas Roy. Pearl: A mobile robotic assistant for the elderly. In *AAAI Workshop on Automation as Caregiver*, Edmonton, Canada, July 2002.