

# Dirk Colbry, Ph.D.

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## EDUCATION

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**Ph.D. in Computer Science and Engineering**, Michigan State University, East Lansing (2006)

- 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.

**M.S.E. in Computer Science and Engineering**, University of Michigan, Ann Arbor (2001)

**Bachelor in Mechanical Engineering**, Georgia Institute of Technology, Atlanta (1997)

## RESEARCH AND ADMINISTRATIVE EXPERIENCE

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**Michigan State University**, East Lansing, Michigan

**Director of HPC Studies, Department of Computational Math, Science and Engineering** (2015-present)

- Developed and teaching new undergraduate CMSE courses including:
  - CMSE401 – Methods for Parallel Programming (Prepping for Spring 2019)
  - CMSE314 – Numerical Linear Algebra (Fall 2017, Fall 2018)
  - CMSE202 – Tools for Computational Modeling (Fall 2016, Spring 2017)
- Developed and co-teaching new CMSE Special Topics Graduate courses including:
  - CMSE 890 - Communications, Teamwork, Ethics and Leadership training for Multidisciplinary Research Teams (Prepping for Spring 2019)
  - CMSE 890 – Algorithms for Next-Generation Architectures (Fall 2018)
  - CMSE 890 – Image Processing Techniques (Spring 2018)
  - CMSE 890 – Programming for Multi-Core Architecture (Fall 2016)
  - PHY 905 – Designing and Building Applications for Extreme Scale Systems (Spring 2016)
- Researching and supporting the development of new Classroom Technologies such as Jupyter notebooks and classroom laptop carts.

**Director, High Performance Computing Center** (2014-2015)

- Hire, supervise and train a team of six (6) HPCC system architects and administrators and an approximately (5) student interns.
- Responsible for \$1M annual scientific computing budget for hardware, software and infrastructure.
- Maintaining advanced research computing facilities, including more than 10,000 compute cores, 1PB of replicated disk space, and specialty hardware (6TB SMP, Xeon Phi, GPGPUs, VCL, Atom, Condor).
- Utilize advanced tools for large-scale system administration, including: Puppet, XCAT, Gitlab, Torque, Moab, Hipchat, Logstash, Ganglia, Graphite, Kanban.
- Support research activities of more than 1000 active users, running over 4 million jobs annually.
- Coordinate annual buy-in process for high capacity users, including developing regional collaborations with users at Central Michigan University, Western Michigan University, Kettering University, and the US Department of Agriculture.

**Research Specialist, Institute for Cyber Enabled Research** (2009-2015)

- Developed and manage student intern program, which has trained 25+ students since 2009.
- Support users in advanced computing software and programming techniques, including: Hadoop/Map Reduce, BLCR, PDE, and over 2000 software titles for science and engineering.
- Assist in training, writing, debugging and supporting scientific and research code in multiple languages, including: C, C++, Python, bash, Java, CUDA, R, MATLAB, SPSS, SAS, Perl, FORTRAN.
- NSF XSEDE Campus Champion support staff, January 2013 - June 2014.
- BEACON, NSF Center for the study of Evolution in Action, Research Affiliate, 2012 - 2014.
- Education, consulting and research collaboration in areas relating to computational science.
- Research in the use of image-informatics to increase the utility of image and video data sources for measuring and recording experimental events.
- 2013 and 2014 CI-Days Planning committee.

**Adjunct Faculty, Electrical and Computer Engineering** (2010-2014)

- Ph.D. Committee Member for Chuck Bardel; project to port electromagnetic simulation code to GPGPU.

**Adjunct Faculty, Computer Science and Engineering** (2006-2007)

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

**Visiting Assistant Professor, Cognitive Science (2006-2007)**

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

**NSF IGERT Research Associate, Cognitive Science (2003-2006)**

- Participated in an interdepartmental Cognitive Science research group studying human navigation.

**Private Research Contractor**

**MTRAC Grant, Consultant (2015)**

- Working with MSU researchers to supervise the development of a large scale image processing system to be commercialized and implemented using cloud resources.
- Designing and building a portable algorithm development system using Jupyter, OpenCV, Puppet and Vagrant.
- Design and implementing a software framework using Apache, Couchdb and Hadoop.
- Assisting in supervising undergraduate students in the development of image processing analytics for use in the system.

**NSF DMR-1507489 Grant, Consultant (2015)**

- Working with MSU researchers to supervise the construction of a novel, software-based 3D tool to model “FIB Based Tomography of Dislocation Structures using Channeling Imaging”.
- Support a Mechanical Engineering Postdoctoral Scholar in learning to program software using image processing and pattern recognition techniques.

**Arizona State University, Tempe, Arizona**

**Assistant Research Professor, CUBiC Center for Cognitive Ubiquitous Computing (2007-2008)**

- Research using pattern recognition and machine vision to develop assistive / rehabilitative technologies.
- Coordinated funding proposal development to sources including NSF, NIH, DoD and others.
- Mentored approximately 15 graduate and undergraduate student researchers.

**University of Michigan, Ann Arbor, Michigan**

**Graduate Research Assistant (2001-2003)**

- 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.

**Graduate Research Fellow (2000)**

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

## TEACHING EXPERIENCE

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**Course Instructor**

**CMSE 890-001: Algorithms for Next-Generation Architectures**

Michigan State University (Fall 2018)

- Students will work with the instructors to come up with specific learning goals and objectives.
- Research topics related to next-generation architectures mostly focused on GPU and FPGA.

**MTH/CMSE 314: Numerical Linear Algebra:**

Michigan State University (Fall 2017, Fall 2018)

- Deep integration of real world coding examples with practical introduction to mathematics.
- Developed entire course including all materials using Jupyter notebooks.
- Taught as a flipped-classroom model.

**CMSE 890-001: Special Topics on Scientific Image Analysis:**

Michigan State University (Spring 2018)

- Developed entire course including all materials using Jupyter notebooks.
- Students from multiple disciplines (ex. Engineering, Math, Astronomy, Biology, Chemistry and Physics)
- Taught as a flipped-classroom model.

### **CMSE 890 section 001: Algorithmic Techniques for Scalable Many-core Computing**

Michigan State University (Spring 2016)

- Multi-University Course led by the Blue Water's Project
- Taught as a flipped-classroom model

### **PHY 905 section 004: Designing and Building Applications for Extreme Scale Systems**

Michigan State University (Spring 2016)

- Multi-University Course led by Dr. Bill Gropp at the University of Illinois
- Taught as a flipped-classroom model

### **UGS 200H: Study of Scientific Measurement using Digital Images and Video**

Michigan State University (Fall/Spring 2012-2013)

- Developed an engineering Honors Research Seminar for first and second year students who developed individual research projects exploring the use of images and video in cross-discipline science projects.

### **CSE 450: Translation of Programming Languages (a.k.a. Compilers)**

Michigan State University (Spring 2012)

- Taught senior-level technical elective, introduced X86 assembly and concepts in multi-core optimization.

### **UGS 200H: CyberGreen, Sustainability in Supercomputing**

Michigan State University (Fall/Spring 2010-2011)

- Developed an engineering Honors Research Seminar for first and second year students who developed individual research projects exploring methods to improve the energy efficiency of supercomputers.

### **ENG 695: Engineering Teamwork Seminar**

The Ohio State University (Spring 2005-2009, 2011)

- Co-taught for-credit, weekend seminar on communications and interpersonal skills vital to success as an engineer in industry. Sponsored by Tau Beta Pi Engineering Honor Society.

### **PSY 992: Programming and Mathematical Concepts in MATLAB for Research Scientists**

Michigan State University (Fall 2006)

- Developed a class to teach mathematical and programming concepts to graduate students conducting research in Statistics, Psychology, Zoology, Telecommunications and Computer Science.

### **CSE 331: Introduction to Algorithms**

Michigan State University (Summer 2003)

- Developed lectures, assignments, labs and exams for accelerated nine week summer class.

## **Workshop Instruction**

### **Entering Mentoring -**

- Program funded by the NIH to train graduate students on effective mentoring of undergraduates. (2016)

### **MATLAB Programming - An Introduction to using MATLAB as a research tool**

- CSTAT Center for Statistical Training and Consulting, Michigan State University (2007, 2011-12, 2014).
- Research and Instructional Technology Seminars for Faculty, Michigan State University (5/11, 1/12, 12/12, 12/13, 5/14).

### **High Performance Computing**

- **"HPC Crash Course"** Part of the second annual MSU Cyber-Infrastructures Days, October 24, 2014
- **"An Introduction to The High Performance Computing Center"** Research and Instructional Technology Seminars for Faculty, Michigan State University (May 10, 2011, January 4, 2012 and December 18, 2012, December 18, 2013).
- **"Making your Research Go Faster: Advanced High Performance Computing"** Research and Instructional Technology Seminars for Faculty, Michigan State University (January 5, 2012 and December 18, 2012, December 18, 2013).
- **"Introduction and Advanced Topic in HPC"** Central Michigan University, Mount Pleasant, MI, (January 4, 2013).

## Laboratory Instructor

### **CSE 450: Translation of Programming Languages**

Michigan State University (Spring 2003)

- Designed and presented weekly lab lectures explaining course material; helped develop course projects.

### **CSE 441: Artificial Intelligence**

Michigan State University (Fall 2002)

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

### **EECS 373: Embedded System Design**

University of Michigan (1999-2000)

- Helped students design advanced embedded systems using Xilinx FPGA and Motorola MPC823.

### **PSY 1010: Freshman Seminar**

Georgia Institute of Technology (1993-1997)

- Assisted freshmen with transition to college, including communications, leadership, major/career choice.

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## ENGINEERING EXPERIENCE

### **Pixel-Velocity Inc.**

#### **Algorithm Developer**, Ann Arbor, Michigan (2015)

- Conducted research and developed algorithms to detect hydrocarbon gas using multispectral imaging systems.
- Conducted research and designed testing software for a third generation video tracking algorithm to be used in high end security system.
- Worked with a team of developers to productize algorithms using Microsoft C#, C++ and OpenCV.
- Developed a windows based algorithm testing framework using Python, Cygwin and Bash.
- Designed, battery operated, portable surveillance system for research, testing and demonstrations.

### **Professional Consulting**

#### **Cooper Tire & Rubber Company**, Findlay, Ohio (2006-2009)

- Consulted on computer vision and pattern recognition methods for tire engineering.
- Developed and taught a four-hour class on using MATLAB as a tool for engineering research.

### **FANUC Robotics North America**, Rochester Hills, Michigan

#### **Robotics Engineer** (1997-1999)

- Supervised installation of 6-7 axis robots, including assembly, programming, system design and debug.
- Extensive international travel as an on-site systems specialist focusing on unique system applications.

### **Delta Air Lines**, Atlanta, Georgia

#### **Liaison Engineering, Co-Op** (1993-1996)

- 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 multi-user interface and database to keep track of engineering requests.

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## HONORS, AWARDS AND SERVICE

### **MSU Hub Fellow 2018-Present**

- Working with the Jupyter Core-Development team to make Jupyter notebooks and Jupyter Lab Accessible for individuals with disabilities
- Working with MSU Central IT to coordinate the development of a campus wide Jupyterhub available to all students.
- Researching ways to extend Jupyter as an interface to compiled languages (C, C++, fortran, CUDA).
- Researching the effectiveness of using Jupyter in On-line courses as compared to active in-person learning.

## **XSEDE / TeraGrid Campus Champion**

- 2012-2014 Campus Champion Support Staff
- 2012-2014 Campus Champion leadership team
- Chair, Birds of a Feather programs for XSEDE 2014 Conference
- Co-Organizer, Birds of a Feather Session on User Training (XSEDE 2013)
- 2012-2013 XSEDE Campus Champion Fellow.
- Campus Champion, Michigan State University (2010-2015).
- 2012 Member, Campus Champion Outreach Working Group and Training Working Group.
- Co-Organizer, Birds of a Feather Session on Small Centers (TeraGrid 2011).
- Invited Campus Champion panel presentation (TeraGrid2011 and XSEDE 2012).

## **Committees and Outreach Activities**

- Chair, MSU Bioinformatics Course Committee, 2016-2017.
- Chair, CMSE Research Technology Committee, 2015-present.
- Chair, CMSE Education Technology Committee, 2015-present.
- Member, CMSE Marking Committee, 2016-present.
- Member, CMSE Workshop Committees, 2016-present.
- MSU Representative, Great Lakes Consortium for Petascale Computation (GLPCP) 2014-2015.
- MSU Representative, Collision for Academic Scientific Computation (CASC), 2014-2015.
- MSU Representative, Committee on Institutional Cooperation, IT Research Computing Peer Group, 2009-2015.
- Chairperson, iCER Research Seminars Committee, 2010-2011.
- Program Committee, 2010 SPIE Workshop on Biometrics.
- Program Committee, 2010 Computer Graphics, Visualization, Computer Vision and Image Processing.
- Program Committee, 2008, 2009, 2012, 2013 Workshop on Applications of Computer Vision (WACV).
- Program Committee, 2008 Biometric Technology for Human Identification VI.
- Graduate Representative, MSU College of Engineering Hearing Board (2005-2006).

## **Recruitment Activities**

- Recruiting for Michigan State University Engineering, Tau Beta Pi National Convention (2010, 2012-13).
- Recruiting for Michigan State University Engineering, Purdue Big 10+ Grad Expo (2010-11, 2013).
- Recruiting for Michigan State University Engineering, Rose Hulman Institute of Technology (2011).
- Recruiting for Arizona State University Engineering, Tau Beta Pi National Convention (2008).

## **Tau Beta Pi Engineering Honor Society**

### **Engineering Futures Facilitator (2006-present)**

- Volunteer Facilitator for seminars on interpersonal communications, teamwork, problem solving, meeting management and effective communications skills at universities across the country.

### **Chapter Advisor, MI-Alpha Chapter at Michigan State University (2010-present)**

- Provide assistance to student officers, participate in group activities and bi-annual chapter initiations.

## **Fellowships and Awards**

- "Best of NEE" Paper Award, ASEE National Conference (2014)
- 2013 Outstanding Community Building Award – XSEDE Campus Champions
- 2012-2013 XSEDE Campus Champion Fellow – in support of XSEDE Gordon Large Scale Video Analytics Project.
- Best Paper, Second Place, ASEE North Central Section Conference (2012)
- National Science Foundation IGERT Student Fellowship.
- Tau Beta Pi Engineering Honor Society.
- 2006 Most Outstanding Graduate Student Award, Michigan State University Computer Science Department.
- IJCAI Student Merit Scholarship.
- University of Michigan Summer Research Fellowship.

## Grants and Funding

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Dirk Colbry, Katy Luchini-Colbry “**CyberTraining: CIP – Professional Skills for CyberAmbassadors.**” PI, National Science Foundation - \$498,330 – 11/1/2017 – 10/31/2020.

Martin Crimp “**FIB Based Tomography of Dislocation Structures using Channeling Imaging,**” Consultant, National Science Foundation - \$319,944 - July 1, 2016 - June 30, 2017.

Tim Zacharewski, Dirk Colbry **Commercialization of the automated Quantitative Histological Analysis Tool (QuHAnT)**”, Co-Pi, MSU MTRAC for the Bio-Economy Tier 1 - \$75,540 - April 7, 2016 - April 6, 2017.

Tim Zacharewski **Data storage and accessibility for the automated Quantitative Histological Analysis Tool (QuHAnT)**”, Consultant, MSU MTRAC for the Bio-Economy Tier 1 - \$75,540 - May 2015 - April 2016.

**XSEDE Subaward in support of the Campus Champion Program**, PI, National Science Foundation - \$82,331 January 1, 2014 – July, 30, 2014.

## JOURNAL PUBLICATIONS

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Irina Sagert, Jim Howell, Alac Staber, Terrance Strother, Dirk Colbry, and Wolfgang Bauer, “**Knudsen-number dependence of two-dimensional single-mode Rayleigh-Taylor fluid instabilities,**” *Physics Review E*, vol. 92, no. 1, p. 013009, Jul. 2015.

Rance Nault Dirk Colbry, Christina Brandenberger, Jack R. Harkema, and Timothy R. Zacharewski “**Development of a computational high-throughput tool for the quantitative examination of dose-dependent histological features**” *Toxicologic Pathology*, 43(3):366-375, 2015.

Irina Sagert, Dirk Colbry, Terrance Strother, Rodney Pickett, Wolfgang Bauer “**Hydrodynamic Shock Wave Studies within a Kinetic Monte Carlo Approach.**” *Journal of Computational Physics*, 266 (2014) p191-213.

JinZhu Chen, Rui Tan, Yu Wang, Guoliang Xing, Xiaorui Wang, Xiaodong Wang, Bill Punch, Dirk Colbry, “**A Sensor System for High-Fidelity Temperature Distribution Forecasting in Data Centers.**” *ACM Transactions on Sensory Networks*, 11(2):30:1-30:25, 2014

Irina Sagert, Wolfgang Bauer, Dirk Colbry, Rodney Pickett and Terrance Strother “**Building a Hydrodynamics Code with Kinetic Theory.**” *Journal of Physics: Conference Series*, 2013.

Dirk Colbry and George Stockman. “**Real time person identification using a canonical face depth map.**” *IET Computer Vision, Special Issue on 3D Face Processing*, June 2009.

Narayanan C. Krishnan, Colin Juillard, Dirk Colbry, and Sethuraman Panchanathan. “**Recognition of hand movements using wearable accelerometers.**” *Journal of Ambient Intelligence and Smart Environments, Special Issue on Wearable Sensors*, October 2009.

Dirk Colbry and George Stockman. “**The 3DID face alignment system for verifying identity.**” *Journal of Image and Vision Computing*, 2008.

George Stockman, Jayson Payne, Jermil Sadler, and Dirk Colbry. “**Error measurement and analysis for a 3D face surface matching 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.

## CONFERENCE PROCEEDINGS

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- Henry Neeman, Hussein Al-Azzawi, Aaron Bergstrom, Zoe Braiterman, Dana Brunson, Dirk Colbry, Eduardo Colmenares, Akilah Fuller, Sandra Gesing, Maria Kalyvaki, Claire Mizumoto, Jeho Park, Anita Schwartz, Jason Simms, Rustomji Vania, **“Progress Update on the Development and Implementation of the Advanced Cyberinfrastructure Research and Education Facilitators Virtual Residency Program,”** To appear in Proceedings of PEARC18 Practice and Experience in Advanced Research Computing, Pittsburgh PA, July 2018.
- Shanoob Balachandran, Zayd Radha, Dirk Colbry, Martin Crimp **“3D Tomography of Dislocations Using Electron Channelling Contrast Imaging and Focussed Ion Beam Milling,”** Proceedings of Materials Property Understanding through Characterization, Pittsburgh PA, August 2017.
- Shanoob Balachandran, Zyde Radha, Dirk Colbry and Martin Crimp **“Focused Ion Beam (FIB) based Tomography of Dislocations Using Electron Channeling Contrast Imaging (ECCI),”** Proceedings of Microscopy & Microanalysis 2017, Volume 23, Issue S1, July 2017, pp. 572-573
- Alexandra Kravchenko, Andrey Guber, Kenneth Stewart and Dirk Colbry, **“Using Statistical and Geostatistical Information to Identify Soil Particulate Organic Matter on X-Ray Computed Micro-tomography Images,”** 65<sup>th</sup> Annual Conference on Applications of X-ray Analysis, Rosemont, IL, August 2016
- Brian Danielak, Brian O’Shea and Dirk Colbry, **“Using Principles from the Learning Sciences to Design a Data-Driven Introduction to Computational Modeling,”** Workshop on Teaching Computational Science (WTCS), San Diego, California, June 2016
- Suzanne Shontz, David Mclaurin, and Dirk Colbry, **“Automated Image Segmentation based on Multiobjective Optimization and Machine Learning.”** Presented at 5th ECCOMAS Thematic Conference on Computational Vision and Medical Image Processing, 2015
- Dirk Colbry, **“Managing Advanced Computational Resources to Encourage Best Practices for Developing Repeatable Scientific Software”** XSEDE 2014 Workshop on Repeatable Science Atlanta, GA, June 2014.
- Dirk Colbry, **“iCER Interns: Engaging Undergraduates in High Performance Computing”** XSEDE 2014 Conference Atlanta, GA, July 2014.
- Dirk Colbry and Katy Luchini-Colbry, **“Scaffolded Structuring of Undergraduate Research Projects”** ASEE 2014 Conference Indianapolis, ID, June 2014. **“Best of NEE” Paper Award.**
- Jim Howell, Wolfgang Bauer, Dirk Colbry, Rodney Pickett, Alec Staber, Irina Sagert, and Terrance Strother, **“Parallelization of Kinetic Theory Simulations”**, in Proceedings of Nuclear Physics: Presence and Future, FIAS Interdisciplinary Science Series, Vol. 2. Springer Verlag, 2014.
- Neelima Shrikhande and Dirk Colbry, **“Discrete and Continuous Curvature Computation for Real Data”** Conference on Intelligent Robots and Computer Vision XXXI: Algorithms and Techniques, part of IS&T/SPIE Electronic Imaging, San Francisco, California, February 2014.
- Dirk Colbry, William Punch, Wolfgang Bauer, **“The Institute for Cyber-Enabled Research: Regional Organization to Promote Computation in Science.”** XSEDE 2013 Conference San Diego, CA, July 2013.
- Katy Luchini-Colbry and Dirk Colbry. **“Gadget Avalanche: A Technology Literacy Course for Novice Adults.”** ASEE Annual Conference Atlanta, GA, June 2013.
- Dirk Colbry and Katy Luchini-Colbry. **“STEM inSight: Developing a Research Skills Course for First and Second Year Students.”** ASEE Annual Conference Atlanta, GA, June 2013.
- Dirk Colbry and Katy Luchini-Colbry. **“CyberGreen: Hands-On Engineering Research in Sustainability and Supercomputing.”** ASEE North Central Section 2012 Conference, Ada, OH, March 2012. **Best Paper Award, Second Place.**
- Dirk Colbry. **“Reducing the barrier to entry using portable apps.”** TeraGrid Conference, July 2011.
- Troy L. McDaniel, Daniel Villanueva, Sreekar Krishna, Dirk Colbry, and Sethuraman Panchanathan. **“Heartbeats: a methodology to convey interpersonal distance through touch.”** In Computer and Human Interaction, pages 3985–3990, 2010.
- Troy McDaniel, Sreekar Krishna, Dirk Colbry, and Sethuraman Panchanathan. **“Using tactile rhythm to convey interpersonal distances to individuals who are blind.”** In Extended Abstracts of Conference on Computer Human Interaction (CHI), Boston Massachusetts, 2009.
- Sreekar Krishna, Dirk Colbry, John Black, Vineeth Balasubramanian, and Sethuraman Panchanathan. **“A systematic requirements analysis and development of an assistive device to enhance the social interaction of people who are blind or visually impaired.”** In Proceedings of the 10th European

Conference on Computer Vision, 2008.

- David Hayden, Dirk Colbry, John A. Black, and Sethuraman Panchanathan. “**Note-taker: Enabling students who are legally blind to take notes in class.**” In Proceedings of the ACM SIGACCESS Conference on Computers and Accessibility (ASSETS), 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,” volume 6944, pages 694403–1 – 694403–9, Orlando, Florida, March 2008.
- Katy Luchini-Colbry, Dirk Colbry and William Punch. “**Designing Introductory Programming Courses for Graduate and Undergraduate Students: A Parallel Case Study.**” Annual American Society for Engineering Education Conference (ASEE), 2007.
- 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, UK, August 2004.
- 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

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- Gabrielle A. Murashova, Dirk Colbry, and Marcos Dantus, “**Spectral unmixing of the native endogenous fluorophores of unstained tissues using multimodal nonlinear optical imaging and comparison of inverse problem solving methods**” Poster presented at 2018 Inverse Problems Symposium, East Lansing Michigan, June 2018.
- Dirk Colbry, “**getexample: Reducing Barriers to Entry on Shared HPC Resources**” Third Annual Workshop on HPC User Support Tools, Salt Lake City, UT, Nov 2016.
- Rance Nault, Dirk Colbry, Jack R. Harkema, and Timothy R. Zacharewski “**Computational high throughput quantitative analysis of dose-dependent histological features.**” Michigan Chapter of the Society of Toxicology, Sept 19, 2013.
- Irina Sagert, Wolfgang Bauer, Dirk Colbry, Rodney Pickett, Terrance Strother “**Building a Hydrodynamics Code with Kinetic Theory.**” Proceedings for the Winter Workshop on Nuclear Dynamics 2013.
- Dirk Colbry, Fred Dyer. Ian Dworkin, Yang Wang, Lifeng Wang. “**Speeding up Scientific Imaging Workflows: Design of Automated Image Annotation Tool.**” UCCV, Florida, January 2013.
- Irina Sagert, Dirk Colbry, Terrance Strother, Rodney Pickett, Wolfgang Bauer “**Hydrodynamic Shock Wave Studies within a Kinetic Monte Carlo Approach.**” Poster presented at MSU CI-Days, 2012.
- Jinzhua Chen, Rui Tan, Yu Wang, Guoliang Xing, Xiaodong Wang, Bill Punch Dirk Colbry. “**A High-Fidelity Temperature Distribution Forecasting System for Data Centers.**” The Thirty-third (33rd) IEEE Real-Time Systems Symposium, San Juan, Puerto Rico, December 4-7 2012.
- Nicholis Ingle, Tim Door, Dirk Colbry, Fred Dyer. “**Coordination of Vision and Action in Chameleons.**” 49<sup>th</sup> Animal Behavior Society Annual Meeting, Albuquerque, NM, June 2012.
- Troy McDaniel, Sreekar Krishna, Vineeth Balasubramanian, Dirk Colbry, and Sethuraman Panchanathan. “**Using a haptic belt to convey non-verbal communication cues during social interactions to individuals who are blind.**” IEEE International Workshop on Haptic Audio visual Environments and their Applications (HAVE), Ottawa, Canada, October 2008. **Best Student Paper Award.**
- Sreekar Krishna, Dirk Colbry, John A. Black, Vineeth Balasubramanian, and Sethuraman Panchanathan. “**A**



**systematic requirements analysis and development of an assistive device to enhance the social interaction of people who are blind or visually impaired.”** In Workshop on Computer Vision Applications for the Visually Impaired, Marseille France, October 2008.

Narayanan C. Krishnan, Dirk Colbry, and Sethuraman Panchanathan. **“Real time human activity recognition using tri-axial accelerometers.”** In Proceedings of Sensor, Signal and Information Processing (SENSIP08) Workshop, 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, February 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 AAI 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 AAI Workshop on Automation as Caregiver, Edmonton, Canada, July 2002.

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## SELECTED PRESENTATIONS AND SPECIAL PROJECTS

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Invited Talk **“Advanced Communication Skills Training for CI Professionals”** XSEDE Campus Champion Monthly Videoconference, September 18, 2018

Coordinator, **“Birds of a Feather, Professional Skills Training in Cyber-Infrastructure”** PEARC Conference Pittsburg PN, August 6, 2018

Invited Talk **“Emerging Technologies (FPGAs)”** Virtual Residency Summer Workshop on "How to Be a More Effective Research Computing Facilitator", Oklahoma City, OK August 9, 2018

Panelist **“Deciding Which Technologies to Adopt, and When”** Virtual Residency Summer Workshop on "How to Be a More Effective Research Computing Facilitator", Oklahoma City, OK August 9, 2018

Invited Talk **“Teams of CI Professionals: Recruitment & Retention, Management, Team-building, and Motivation Panel”** Virtual Residency Summer Workshop on "How to Be a More Effective Research Computing Facilitator", Oklahoma City, OK August 7, 2018

Invited Talk **“Leading and Listening in Complex CI Conversations”** Virtual Residency Summer Workshop on "How to Be a More Effective Research Computing Facilitator", Oklahoma City, OK August 6, 2018

Invited Talk **“Interface between academia and industry”** Panel discussion for graduating engineers at the 2016 Beacon Conference. Michigan State University, East Lansing, MI (August 9, 2016)

Special Workshop, **“Pelican Github.io Tutorial”** Special Workshop, East Lansing, MI (July 17, 2015)

Invited Talk, **“Autobiography of an Engineer”** Summer 2015 Engineering Summer Undergraduate Research Experience at Michigan State University, East Lansing, MI (June 17, 2015)

Invited Talk, **“Do More, Faster: Utilizing Advanced Computing Hardware”** Banquet Speaker 2018 Inverse Problems Symposium, East Lansing Michigan, June 2018., East Lansing, MI (June 17, 2015)

Invited Talk, **“Teaching Integrated Studies Concepts Using Programming and Jupyter Notebooks”**, Teaching and Learning Spring Conference, East Lansing Michigan, June 2018., East Lansing, MI (May 10, 2018)

Invited Talk, **“Master Your Tasks: popular approaches to productivity, ranging from paper-and-pencil to the latest mobile apps”** Spring 2015 Wednesday Night Alive Seminar at Okemos Community Church, Okemos, MI (April 22, 2015)

Invited Talk, **“Science and Supercomputing”** Spring 2014 Seminar Series in the College of Mathematics and Science at the University of Central Oklahoma, Oklahoma City, OK (April 3, 2014)

Invited Talk, **“Cloud Computing for Research”** Special Presentation to MSU Researchers. (January 22, 2014)

Invited Talk, **“Plenary Presentation, XSEDE Fellows Program”** XSEDE 13, San Diego, CA (July, 25 2013)

Invited Talk, **“XSEDE: Accessing and Using Advanced Computational Hardware to Make Your Research Go Faster”** Webcast to seven BEACON affiliated Universities, (January 11, 2013)

Traveling Talk, **“Do More, Faster: Utilizing Advanced Computational Hardware”**

- PHY480-PHY832 Computational Physics (April 1, 2014)
- MSU fMRI Users Seminar Series (March 12, 2014)
- LB 490A, Methods of Computational Science: Solving Problems With Computers (March 11, 2014)
- Quantitative Fisheries Research Seminar (February 27, 2014)
- CHE/MSE 802 Research Methods class (November 29, 2013)
- MSU Engineering Graduate Student Professional Development Seminar (January 23, 2013)
- Electrical and Computer Engineering, faculty seminar (September 6, 2012).
- Bioinformatics seminar (June, 2012)
- Visiting Iraqi Fulbright Faculty (August 18, 2011).
- MSU Summer Engineering Undergraduate Research Experience Seminar (June 15, 2011).
- Central Michigan University Engineering Research Colloquium (February 28, 2011).
- BEACON Congress (August 11, 2010).
- Hope College Student Colloquium (April 14, 2010).

Invited Talk, **“From Images to Data: Scaling and Streamlining Research Workflows”**  
Michigan State University, Cyber-Infrastructure Days (October 26, 2012).

Panel Participant, **“Making the Most of your Undergraduate Research Experience”** (October 10, 2012)

Panel Participant, **“Getting into Graduate School”** Tau Beta Pi Convention (September 27, 2012).

Invited Talk, **“Image Phenomics: The Development of an Image Grammar for High-Throughput Phenotyping Using Biological Images”** Michigan State University, BEACON Seminar (September 21, 2012).

Invited Talk, **“What can I do with this Gadget: iPods, iPads, iPhones”**  
Michigan State University, Women’s Resource Center (Spring 2012).

Short Course, **“Tech Gadget Avalanche: Navigating the Ever-changing World of Portable Devices”** Michigan State University Evening College, Alumni Lifelong Education (Spring 2012, Fall 2012).

Short Course, **“Supercomputers: Cutting Edge, Powerful, Awesome!”** Michigan State University Evening College, Alumni Lifelong Education (Fall 2011).

Weekly Seminar Series, **“HPCC Mid-Morning Breaks”**  
Michigan State University iCER Seminar Series on Computational Science (2009-2011).

Invited Talk, **“Introduction to iCER and the HPCC”**  
Michigan State University New Faculty Orientation (August 2011-2013).

Invited Talk, **“3D Face Recognition: Towards a Large Database”**  
Hope College Student Colloquium (April 2, 2009).

Invited Talk, **“Biometrics: Measuring and Analyzing Human Body Characteristics for Recognition”**  
Arizona State University CPI 101: Introduction to Informatics (November 15, 2007).

Invited Demo, **“Person Identification by 3D Surface Alignment: The 3DID Face Verification System”**  
CVPR Conference on Computer Vision and Pattern Recognition (2009).

Invited Talk, **“Person Verification by 3D Surface Alignment”**  
University of Notre Dame Computer Science and Engineering Seminar (February 27, 2007).

Invited Talk, **“Live Demonstration of the 3DID System”**  
Wright State University Computer Science Seminar (February 2, 2007).

Invited Talk, **“Self Evaluation Using Myers-Briggs Temperament”**  
Michigan State University CSE 291 and 491 (October 20, 2006).

Invited Participant, **Face Recognition Advanced Study Workshop** (November 11-13, 2005).

Invited Talk, **“Analysis of 3D Face Alignment”**  
Hope College Student Colloquium (October 13, 2005).

Invited Talk, **“Pattern Recognition for Classification and Matching of Car Tires”**  
Tire Society Conference (September 2003).

## GRADUATE COMMITTEES

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Alyssa Kim Kyungmin, Department of Crop and Soil Sciences, Current.  
Mark Berardi, Department of Communicative Sci & Disorders, Current.  
Hamzeh Ghasemzadeh, Department of Communicative Sci & Disorders, Current.  
Gabrielle Murashova, Department of Chemistry, Current  
Michelle Quigley, Department of Crop and Soil Sciences “**Contribution of Soil Pores to the Processing and Protection of Soil Carbon at Micro-Scale**” Summer 2018  
Chris Sullivan, Dual Degree, Department of Physics and Astronomy and Computational Mathematics Science and Engineering “**Constraining Nuclear Weak Interactions in Astrophysics and New Many Core Algorithms for Neuroevolution**”, Spring 2018  
Byron Zambrano, Department of Mechanical Engineering, “**The role of hemodynamics on intraluminal thrombus accumulation and abdominal aortic aneurysm expansion: A longitudinal patient specific study**”, Fall 2017

## SELECTED MENTORED STUDENT RESEARCH PROJECTS

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Mohammed Salih, “**Fitting iCE-Cube Neutrino Path models using Neural Networks**,” Poster presentation at Mid-Sure, 2018.  
Ty Buckley, Bella Oh, “**Project Insight: Development of Programming Tools for Scientific Image Analysis**,” Poster presentation at UURAF, April 13, 2018.  
Andrew Jong, “**Building framework for running compiled languages in jupyter notebook**.” High School Honors Science, Math and Engineering Program, 2017  
Nolan Feeny, “**Interactive Scientific Image Annotation Using Jupyter Notebooks**.” Poster presentation at Mid-Sure, 2017.  
David Raymond Liu, “**Independent study to learn 3D data manipulation in Python**”, CMSE499 Summer 2017.  
Kenneth Stewart, “**Interface for Particulate Organic Matter Image Processing and Analysis**.” Poster presentation at Mid-Sure, 2016  
Zayd Radha, “**Image Based Detection and Three-Dimensional Reconstruction of Dislocations in Metallic Crystal Lattice Structures**.” Poster presentation at Mid-Sure, 2016  
Anna Schmidt, “**Analysis of Image Upload Methods for Quantitative Histological Analysis Tool (QuHAnT)**.” Poster presentation at Mid-Sure, 2016  
Daria Tarasova, “**Development of Image Quality Controls Modules for Web-Based Image Submission System**.” Poster presentation at Mid-Sure, 2016  
Jingyi Liu, “**Development of User Interface Design for High-Throughput Image Analysis**.” Poster presentation at Mid-Sure, 2016  
Aaron Beckett, “**Testing the Effectiveness of Chamview: Evaluation of a Researcher in the Loop Workflow for Image Analysis**.” Poster presentation at UURAF, April 4 2014.  
Manuel Dosalman, “**Toolbox for evaluating algorithms that detect anchor points in images**.” Poster presentation at Mid-SURE, July 24, 2013  
Ali Radha, “**Automated Image Segmentation System for use in Research Workflows**.” Poster presentation at Mid-SURE, July 24, 2013  
Cecilia Prentice, “**Improving the Accuracy and Efficiency of Image Phenomics**.” Poster presentation at Mid-SURE, July 24, 2013  
Nilab MohammadMousa, “**Avida Checkpoint Restart Implementation**.” Poster presentation at Mid-SURE, July 24, 2013  
Aaron Beckett, “**Research Centered Design: A Case Study in Building Usable Image Analysis Tools for Researchers**.” Poster presentation at Mid-SURE, July 24, 2013  
Sean Heider, “**Interpolation of Identifier Points of Landmarks that Create Stitched Images with Varying Levels of Focus**.” Poster presentation at Mid-SURE, July 24, 2013  
Alec Staber, Dirk Colbry, Irina Sagert, Wolfgang Bauer. “**Implosions, Instability and Implementations**.” Poster presentation at Mid-SURE, July 24, 2013  
Amy Marie Dentlinger, “**Healthy vs. Unhealthy: Analysis of FMRI Images In Relation to Food Choice**.” Poster presented at the MSU Undergraduate Research and Arts Forum, April 2013.  
Brock Andrew Krygier, “**Background Subtraction**.” Poster presented at the MSU Undergraduate Research and

Arts Forum, April 2013.

- Goksu Adanali, "**Facial Expression Analysis.**" Poster presented at the MSU Undergraduate Research and Arts Forum, April 2013.
- Usienemfon Adia Nimuwa, Dirk Colbry and Frank Dazzo "**Optimizing CMEIAS A Novel Computing Tool for Microbial Ecology.**" Poster presented at the MSU Undergraduate Research and Arts Forum, April 2013.
- Kathryn Lee Gwizdala, "**The Automation of Chestnut Grading.**" Poster presented at the MSU Undergraduate Research and Arts Forum, April 2013.
- Danielle Marie Heger, "**Improving Chamview Software Through Python Programming.**" Poster presented at the MSU Undergraduate Research and Arts Forum, April 2013.
- David Michael Zoltowski, "**Correlation Between Brain Volumes and Age in People with Alzheimer's Disease.**" Poster presented at the MSU Undergraduate Research and Arts Forum, April 2013.
- Aaron Beckett, "**Speed Dating Technology: Finding the Right Program For Analyzing Audio and Video Data.**" Poster presented at the MSU Undergraduate Research and Arts Forum, April 2013.
- Peterson, Rachel Ann, "**An Analysis of the Workflow in Studying the Biomechanics of Equine Circular Locomotion**" Poster presented at the MSU Undergraduate Research and Arts Forum, April 2013.
- Jinzhu Chen, Rui Tan, Yu Wang, Guoliang Xing, Xiaodong Wang, Bill Punch Dirk Colbry. "**A High-Fidelity Temperature Distribution Forecasting System for Data Centers.**" Poster presentation at Engineering Research Symposium, November 9, 2012.
- Jeremy Martin. "**Automated Color Space Exploration in Image Processing.**" Poster presentation at the MSU Summer Undergraduate Research Forum, July 2012.
- Patrick Korth. "**Using reinforcement Learning with SIFT to Track Objects in Videos.**" Poster presentation at the MSU Summer Undergraduate Research Forum, July 2012.
- Austin Hendry, iCER Intern. "**MyQsub.**" Poster presented at the MSU Summer Undergraduate Research Forum, July 2012.
- Brea Myers. "**The Variation of Accuracy and Precision in Ground Truth Points.**" Presentation at the MSU Summer Undergraduate Research Forum, July 2012.
- Shiloh Jordan. "**Automated Image Measurements.**" Presentation at the MSU Summer Undergraduate Research Forum, July 2012.
- Jassiem Ifill. "**Aiding Manual Image Annotation using A Kinematic Model.**" Presentation at the MSU Summer Undergraduate Research Forum, July 2012.
- Joe Greere, iCER Intern. "**Powertools: user level tools that improve researcher experience on high power computing systems.**" Poster presented XSEDE'12, Chicago IL, July 2012.
- Peng Xu, Independent Study. "**Visualizing Simulated Supernova.**" Poster presented at the MSU Summer Undergraduate Research Forum, July 2011.
- Rodney Picket, Blue Waters Undergraduate Intern. "**Profiling Numerical Simulation of Core Collapse Supernovae.**" Poster presented at the MSU Summer Undergraduate Research Forum, July 2011.
- Bob Valentic. "**Thermal Recycling.**" Poster presented at the MSU Undergraduate Research and Arts Forum, April 2011.
- Katrina Suchoski. "**Condor System.**" Poster presented at the MSU Undergraduate Research and Arts Forum, April 2011.
- Kayla Hunt. "**Red Cedar Water Table Cooling.**" Poster presented at the MSU Undergraduate Research and Arts Forum, April 2011.
- Michael Mock. "**Window Cooling in the High Performance Computing Center.**" Poster presented at the MSU Undergraduate Research and Arts Forum, April 2011.
- Nickolas Salic. "**Deep Fried Server.**" Poster presented at the MSU Undergraduate Research and Arts Forum, April 2011.
- Su Xiao. "**Cost Effectiveness in MSU High Performance Computing Center.**" Poster presented at the MSU Undergraduate Research and Arts Forum, April 2011.
- Josh Fenton. "**Using 3D Scanning Technology to Evaluate Anchor Point Detection Algorithms.**" Poster presented at the MSU Undergraduate Research and Arts Forum, April 2011.

- Tim Door, Professorial Assistant. "**A Flexible Research Interface to Streamline Manual Image Analysis.**" Poster presented at MSU Undergraduate Research and Arts Forum, April 2011.
- Charles Bardel. "**Investigate Methods for Porting Existing FEM solvers to GPGPUs to speed up computation.**" Graduate Independent Study, Fall 2010.
- Ryan Braley. "**Image capture of real world LEGO building.**" Arizona State University, Fulton Undergraduate Research (FURI) 2008.
- John Hunt, Michael Walker, Felix Rusu, Paul Mickevicius, Ben Armistead. "**Low cost 3D Face Recognition System.**" Arizona State University CSE 423 Capstone, April 2008.
- Michelle Lessin, Tim Goodrich, Cherica Quashie, Scott Owen, Brandon Billaber. "**Three Dimensional Laser Scanner for Face Recognition.**" Arizona State University CSE 423 Capstone, April 2008.
- Brian Yang "**Making Power Point Accessible to individuals who are Blind.**" National Science Foundation, Research Experience for Undergraduates (REU) 2007.
- Collin Juillard. "**Anchor Point Detection for Facial-Expression Recognition.**" Arizona State University, Fulton Undergraduate Research (FURI) Symposium, April 2007.
- Daniel Merrill. "**Social Interaction Assistant for Individuals who are Blind.**" Arizona State University, Fulton Undergraduate Research (FURI) Symposium, April 2007.
- David Hayden. "**Note Take Project for improved Classroom Access.**" National Science Foundation, Research Experience for Undergraduates (REU) 2007.
- Nathan M. Sullivan. "**3D Face Recognition Using Discrete Differential Geometry and Symmetry Detection.**" Masters Thesis, Central Michigan University, 2007.
- Renaldo Ferguson, Nathan Furtwangler, Daniel Merritt, James Pita, Timothy Wall. "**Autonomous Terrain Mapping for Robotic Exploration.**" Presentation made at the MSU Undergraduate Research and Arts Forum, April 2007.
- Greg Heil. "**Fully Automatic 3D Surface Alignment for Face Matching.**" Poster presented at the Computer Science Department Workshop, April 2006.
- Rayshawn Hollobrook. "**Three dimensional face data formatting.**" Poster presented at the McNair SROP Scholars Symposium, August 2006.
- Charles Otto. "**Depth, Intensity, and Curvature Based Face Verification.**" Poster presented at the MSU Undergraduate Summer Research program, September, 2006.
- Charles Otto. "**High Performance Three-Dimensional Face Recognition.**" 2<sup>nd</sup> place research poster award at the Tenth Annual CSE Poster Workshop, Michigan State University, April 2006.
- Maxwell Walter. "**A Computer Interface for Playing Checkers.**" Poster presented at the Michigan State University Undergraduate Research and Arts Forum, April 2004.