Dirk Colbry, Ph.D.

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EDUCATION

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

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

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.

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.

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

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

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. Zacharewsk "**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 Panchanthan. "**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

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,"** 65th 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

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.

Jinzhu 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."** 49th 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 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.

SELECTED PRESENTATIONS AND SPECIAL PROJECTS

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

Alyssa Kim Kyungmin, Crop and Soil Sciences, Current.
Mark Berardi, Department of Communicative Sci & Disorders, Current.
Gabrielle Murashova, Chemistry, Current
Michelle Quigley, 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, 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, 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

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 Though 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.**" 2nd 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.