thomas **swearingen**

biometrics graduate student

about

428 S. Shaw Lane
Room 3115
East Lansing, MI
48824
U.S.A.

swearin3@msu.edu
http://thswear.com

programming

MATLAB
Python
C++

course work

Pattern Recognition
Computer Security
Machine Learning
Computer Vision
Graph Theory
Data Mining
Statistics

education

since 2013	**Ph.D.** Qualified Status Arun Ross, Advisor	Michigan State University
Fall 2016	**Visiting Student** Kalyan Veeramachaneni, Host	Massachusetts Institute of Technology
2008-2013	**B.S. summa cum laude** Majoring in Computer Engineering Minoring in Mathematics	University of Tennessee, Knoxville

projects

since 2015 — **Graph-Based Operational Face Recognition** — NIJ
Explore a graph-based face recognition algorithm which incorporates a variety of demographic information (e.g. name, gender, occupation, etc.). Project sponsored by the National Institute of Justice (NIJ).

2016-2017 — **Auto-Tuned Models (ATM)**
Work on a Machine Learning project that can automatically choose a classifier with the optimal set of parameters given a feature set. Collaboration with Kalyan Veeramachaneni at MIT.

2013-2014 — **Biometrics and Demographics** — CITeR
Preliminary study on methods to combine biometric data and demographic data. This includes a statistical study of demographic correlation between name and face. Project sponsored by the Center for Identification Technology Research (CITeR).

2013-2014 — **Cross Spectral Face Recognition** — FBI
Develop face recognition techniques for matching NIR and VIS spectrum face images. Create a GUI in C++ that implements these techniques. Project sponsored by the Federal Bureau of Investigation (FBI).

2013 — **Multiple-Instance Learning with Spatial Enhancement** — DOE
Explore the possibility of expanding multiple-instance learning to include spatial content from aerial imagery to improve classification performance. Project sponsored by the Department of Energy (DOE).

2012 — **Aerial Imagery Feature Evaluation** — DOE
Explore how the spatial arrangement of the low-level features can classify various aerial scene categories. Project sponsored by the Department of Energy (DOE).

experience

05–07 2013	**Oak Ridge National Lab, Oak Ridge, TN**	Research Internship
	Intern in the Geographic Information Science and Technology Group.	
06–08 2012	**Oak Ridge National Lab, Oak Ridge, TN**	Research Internship
	Intern in the Geographic Information Science and Technology Group.	
05–08 2011	**Georgia-Pacific Big Island, LLC, Big Island, VA**	Internship
	Intern in the IT department.	
01–05 2010	**Georgia-Pacific Big Island, LLC, Big Island, VA**	Internship
	Intern in the IT department.	
08–12 2009	**University of Tennessee, Knoxville, TN**	Undergraduate Assistant
	Undergraduate Assistant in the Engineering Fundamentals Department.	

awards

2016	**Poster Honorable Mention**	Michigan State University
	Engineering Graduate Research Symposium	
2013	**Citation for Extraordinary Professional Promise**	University of Tennessee
2013	**Outstanding Computer Engineering Senior**	University of Tennessee
2012	**Outstanding Computer Engineering Junior**	University of Tennessee
2011	**Outstanding Computer Engineering Sophomore**	University of Tennessee

fellowships and scholarships

2015-2017	**National Institute of Justice**	$150,000
	Graduate Research Fellowship	
2013	**Michigan State University**	$34,990
	Engineering Distinguished Fellowship	
2012	**University of Tennessee**	$975
	Robert and Alliene Lay Scholarship	
2012	**University of Tennessee**	$1,300
	Leonard and Betty Shealy Scholarship	

service

Jan. 2015	**Girl Scout STEM Day**	Michigan State University
	Gave a demo of face recognition to middle school girls interested in STEM.	
Jun. 2015	**Women in Computing Camp**	Michigan State University
	Gave a demo of face and fingerprint recognition to girls interested in STEM.	
Jul. 2015	**Women in Computing Camp**	Michigan State University
	Gave a demo of face and fingerprint recognition to girls interested in STEM.	
Feb. 2016	**Introduce a Girl to Engineering Day**	Michigan State University
	Gave a brief demo of face recognition to elementary and middle school girls.	

Jun. 2016	**Women in Computing Camp**	Michigan State University
	Gave a demo of face and fingerprint recognition to girls interested in STEM.	
Jun. 2016	**High School Engineering Institute**	Michigan State University
	Gave a demo of face recognition to high school students interested in engineering.	
Jul. 2016	**High School Engineering Institute**	Michigan State University
	Gave a demo of face recognition to high school students interested in engineering.	
Jul. 2017	**High School Engineering Institute**	Michigan State University
	Gave a demo of face recognition to high school students interested in engineering.	
Nov. 2017	**Introduce a Girl to Engineering Day**	Michigan State University
	Gave a brief demo of face recognition to elementary and middle school girls.	

publications

T. Swearingen, W. Drevo, B. Cyphers, A. Cuesta-Infante, A. Ross and K. Veeramachaneni. "ATM: A distributed, collaborative, scalable system for automated machine learning," *Proc. of 2016 IEEE International Conference on Big Data (Big Data 2017), (Boston, MA, USA)*, December 2017. *To Appear*.

T. Swearingen and A. Ross. "Label propagation approach for predicting missing biographic labels in face-based biometric records," *IET Biometrics*. 2017.

C. Chen, A. Dantcheva, T. Swearingen, and A. Ross, "Spoofing Faces Using Makeup: An Investigative Study," *Proc. of 3rd IEEE International Conference on Identity, Security and Behavior Analysis (ISBA 2017)*, (New Delhi, India), February 2017. **Best Paper (Runner Up).**

T. Swearingen and A. Ross, "Predicting Missing Demographic Information in Biometric Records using Label Propagation Techniques," *Proc. of the 15th International Conference of the Biometrics Special Interest Group (BIOSIG 2016)*, (Darmstadt, Germany), September 2016.

T. Swearingen and A. Cheriyadat, "Spatial feature evaluation for aerial scene analysis," *Proc. of 2012 IEEE Applied Imagery Pattern Recognition Workshop (AIPR 2012)*, (Washington, D.C., USA), October 2012.