

Gregory I. Holste

website: gholste.me • github: github.com/gholste • email: giholste@gmail.com

EDUCATION

- The University of Texas at Austin**, Austin, TX Aug. 2021-present
M.S., Ph.D. in Electrical Engineering Advisor: Zhangyang (Atlas) Wang
- Ph.D student in DICE track of Electrical and Computer Engineering (ECE) department
- Kenyon College**, Gambier, OH Aug. 2016-May 2020
B.A. in Mathematics & Statistics
- GPA: 3.91 / 4.00 (*summa cum laude*)
 - Concentration in Scientific Computing; Minor in Biology

RESEARCH EXPERIENCE

- Michigan State University**, East Lansing, MI Aug. 2019-July 2021
Medical Imaging & Data Integration Lab Advisor: Adam Alessio
- Developed novel ensemble methods for rib fracture detection in pediatric chest radiographs
 - Implemented and compared multimodal fusion models that learn jointly from breast MRI images and associated non-image clinical data
 - Submitted solutions to RSNA Pulmonary Embolism Detection Challenge and MICCAI 2020 RibFrac Challenge (our “top” solution to be included in challenge summary paper)
- Michigan State University**, East Lansing, MI Summer 2019
ACRES Research Experience for Undergraduates (REU) Advisor: Adam Alessio
- Implemented methods to automatically segment eight regions of the chest in pediatric radiographs
 - Investigated methods to improve anatomic segmentation with 10^5 -fold imbalance between classes, including custom pixel weight maps and loss functions [1]
 - Presented work at Mid-SURE Symposium 2019 and as an oral at SPIE Medical Imaging 2020
- Kenyon College**, Gambier, OH Jan. 2017-May 2019
Kerkhoff Macroecology Lab Advisor: Andrew Kerkhoff
- Used **R** to uncover distribution patterns of crop wild relatives (CWRs) in the Americas
 - Compared spatial patterns of CWR diversity and range size to those of all plants using millions of species occurrence records from the Botanical Information & Ecology Network (BIEN)
 - Discovered regions significantly more CWR-rich than would be expected by chance via Monte Carlo simulation
- Baylor College of Medicine**, Houston, TX Summer 2018
Neurological Research Institute | Liu Lab Advisor: Zhangdong Liu
- Graph-theoretic analysis of protein-protein interaction networks with Python and Cytoscape
 - Identified and ranked genes as candidates for causing neurodegenerative disease by node centrality (“importance”) measures and a heat diffusion approach
 - Compared community detection algorithms to find meaningful clusters of genes and diseases

PUBLICATIONS

- [1] **G. Holste**, R. Sullivan, M. Bindschadler, N. Nagy, A. Alessio. “Multi-class semantic segmentation of pediatric chest radiographs” in *Proc. SPIE Medical Imaging 2020: Image Processing*. 10 March 2020.
- [2] R. Sullivan, **G. Holste**, J. Burkow, A. Alessio. “Deep learning methods for segmentation of lines in pediatric chest radiographs” in *Proc. SPIE Medical Imaging 2020: Computer-Aided Diagnosis*. 16 March 2020.

HONORS & AWARDS

Charles W. and Margaret A. Tolbert Endowed Scholarship UT Austin Cockrell School of Engineering scholarship for top incoming engineering students	Aug. 2021-present
Phi Beta Kappa Elected to the Kenyon College chapter of the national academic honor society	May 2020-present
Sigma Xi Inducted into the Kenyon-Denison chapter of the science research honor society	Feb. 2020-present
Pi Mu Epsilon Elected to the Ohio Pi chapter of the national mathematics society	Apr. 2018-present
Wendell D. Lindstrom Memorial Prize One of 12 students given prize for outstanding mathematics students at Kenyon College	Apr. 2018
Kenyon College Merit List (8x)	every semester

ORAL PRESENTATIONS

Multi-class semantic segmentation of pediatric chest radiographs <i>SPIE Medical Imaging: Image Processing, Houston, TX, USA</i>	Feb. 2020
--	-----------

INVITED TALKS

Fusing imaging and clinical information for improved automatic breast cancer detection <i>MSU Virtual Imaging Research Symposium, East Lansing, MI, USA</i>	Feb. 2021
Automatic segmentation of pediatric chest radiographs <i>Kenyon College Math Monday, Gambier, OH, USA</i>	Nov. 2019

SCIENTIFIC ABSTRACTS

Rib fracture detection in pediatric radiographs via deep convolutional neural networks J. Burkow, G. Holste , F. Perez, J. Junewick, A. Zbojnowicz, J. Frost, E. Romberg, S. Menashe, J. Otjen, A. Alessio <i>International Pediatric Radiology Congress, Milan, Italy</i>	October 2021
Automatic segmentation of chest radiographs with deep learning G. Holste , R. Sullivan, N. Nagy, M. Bindschadler, A. Alessio <i>Mid-SURE Symposium, East Lansing, MI, USA</i>	July 2019
Deep learning methods for automatic evaluation of lines in chest radiographs R. Sullivan, G. Holste , A. Alessio <i>Mid-SURE Symposium, East Lansing, MI, USA</i>	July 2019

TECHNICAL SKILLS

Languages: Python (PyTorch, Keras), R, C++

Technologies: Git, Linux/Unix, L^AT_EX

Mathematics background: Calculus, Probability, Linear Algebra, Statistical Modeling (Regression, CART), Machine Learning (Random Forests, Convolutional Neural Networks)