

# Erin Carrier

## EDUCATION-----

- University of Illinois Urbana-Champaign Graduated: May 2019
- ✦ PhD: Computer Science
  - ✦ Research Area: Scientific Computing
- Grand Valley State University, Allendale, MI Graduated: April 2013
- ✦ Bachelor of Science: Computer Science
  - ✦ Minor: Mathematics

## CURRENT POSITION-----

- Assistant Professor, Grand Valley State University Aug 2019 - Present
- ✦ Courses Taught:
    - CIS 241: System-level Programming and Utilities Fall 2019 – Winter 2022
    - CIS 161: Computational Science Fall 2020 – Winter 2022
    - CIS 678: Machine Learning Winter 2020
    - CIS 163: Computer Science II Winter 2020, Winter 2022
    - CIS 101: Thriving in Our Digital World Fall 2019

## RESEARCH & PROFESSIONAL EXPERIENCE-----

- PhD Student, University of Illinois Aug 2013 – May 2019
- ✦ Thesis Title: Exploiting Compression when Solving Discretized Linear Systems
  - ✦ Advisor: Michael Heath
  - ✦ Investigating a compression-based method for solving linear system
  - ✦ Examining performance for variety of 1D and 2D test problems
  - ✦ Exploring how choice of basis and choice of discretization affect performance
  - ✦ Research assistant (spring 2019, summer 2018, summer 2017, summer 2015)
- Graduate Intern, Risk and Reliability Analysis, Sandia National Labs May 2016 – Aug 2016
- ✦ Improved HyRAM, a toolkit for hydrogen risk assessment
  - ✦ Profiled code and decreased code runtime
  - ✦ Performed code verification and identified and fixed bugs
  - ✦ Documented numerical methods used by HyRAM
- Graduate Research Assistant, Los Alamos National Laboratory May 2014 – Aug 2014
- ✦ Participant in LANL Co-Design Summer School
  - ✦ Worked as part of a six student, interdisciplinary team
  - ✦ Implemented tile-based adaptive mesh refinement
  - ✦ Compared various runtime systems
- Research Project (Group), Grand Valley State University May 2012 – May 2013
- ✦ Topic: PyGASP: Python-based GPU-accelerated signal processing
  - ✦ Advisor: Dr. Greg Wolffe
  - ✦ Worked in the Distributed Execution Network Lab (DEN)
  - ✦ Developed a signal-processing toolkit accelerated using PyCUDA
  - ✦ Investigated possible scientific applications

## TEACHING EXPERIENCE-----

- Teaching Assistant (Python for Data), University of Illinois Mar 2019 – Present
- ✦ Assist with development of material for new course
  - ✦ Aid students during interactive portions of class time
  - ✦ Monitor Piazza, attendance, and completion of activities
- Lead Teaching Assistant (Numerical Methods), University of Illinois Aug 2018 – Dec 2018
- ✦ Lead TA for course with approximately 450 total students
  - ✦ Oversee team of 10-15 teaching and course assistants
  - ✦ Organize duties and schedule and oversee completion of work
- Lead Teaching Assistant (Numerical Methods), University of Illinois Aug 2017 – May 2018
- ✦ Lead TA for class with approximately 400 total students
  - ✦ Interfaced with students regarding issues
  - ✦ Oversaw team of 8-10 teaching and course assistants
  - ✦ Organized task schedule and oversaw deadlines
- Teaching Assistant (Numerical Analysis), University of Illinois Aug 2016 – May 2017
- ✦ Held office hours and interfaced with students regarding issues
  - ✦ Coordinated exams with CBTF and prepared exams and quizzes
- Teaching Assistant (Numerical Methods), University of Illinois Aug 2015 – May 2016
- ✦ Interfaced with students regarding issues
  - ✦ Held office hours
  - ✦ Created assignments and exams
- Teaching Assistant (Numerical Analysis), University of Illinois Aug 2014 – May 2015
- ✦ Held office hours
  - ✦ Created homework assignments
- Teaching Assistant (Numerical Methods), University of Illinois Aug 2013 – May 2014
- ✦ Held office hours
  - ✦ Created exams and homework assignments

## PUBLICATIONS-----

- E. Carrier and M. T. Heath. Exploiting compression in solving discretized linear systems. *Electronic Transactions on Numerical Analysis* 55 (2022), pp. 341-364 Jan 2022
- N. Funckes, E. Carrier and G. Wolffe. An augmented image captioning model: Incorporating hierarchical image information. 2021 20<sup>th</sup> IEEE International Conference on Machine Learning and Applications (ICMLA). Virtual, 2021, pp. 1608-1614. Dec 2021
- L. Drennan, Chesser M., J. Lozano, and E. Carrier. Identifying high-risk workspaces during COVID-19 using machine learning. *The International FLAIRS Conference Proceedings*, 34 (2021). May 2021
- R. C. Brost, E. E. Carrier, M. J. Carroll, K. M. Groth, W. P. Kegelmeyer, V. J. Leung, H. E. Link, A. J. Patterson, C. A. Phillips, S. Richter, D. Robinson, A. Staid, D. M.-K. Woodbridge. Adverse event prediction: using graph-augmented temporal analysis: final report. Sandia Technical Report SAND 2018-11123. October 2018 Oct 2018
- K.M. Groth, E.S. Hecht, J.T. Reynolds, M.L. Blaylock, E.E. Carrier. Methodology for assessing the safety of Hydrogen systems: HyRAM 1.1 technical reference manual. Sandia Technical Report SAND2017-2998. March 2017 Mar 2017

N. Bowman, E. Carrier and G. Wolffe. PyGASP: Python-based GPU-accelerated signal processing. IEEE International Conference on Electro Information Technology, EIT 2013. Rapid City, SD, 2013, pp. 1-6. May 2013

## PRESENTATIONS-----

Exploiting Compression in Solving Discretized Linear Systems Aug 2022  
 2022 FEniCS Conference  
 San Diego, CA (Talk)

Solving Discretized Linear Systems: How to Exploit Compression Nov 2021  
 GVSU Applied Mathematics Seminar  
 Allendale, MI (Talk)

Understanding of the Needs of Students with Disabilities based on Universal Design Of Learning Principle Sep 2021  
 CMD-IT/ACM Richard Tapia Celebration of Diversity in Computing Conference  
 Virtual (Panelist)

Identifying High-risk Workspaces during COVID-19 using Machine Learning May 2021  
 2021 International Florida Artificial Intelligence Research Society Conference  
 Hybrid: Miami, FL and Virtual (Virtual Poster Presentation)

A Sampling-based Method for Solving Linear Systems March 2018  
 15<sup>th</sup> Copper Mountain Conference on Iterative Methods  
 Copper Mountain, CO (Talk)

PyGASP: Python-based GPU-Accelerated Signal Processing May 2013  
 2013 IEEE Intern. Conference on Electro/Information Technology  
 Rapid City, SD (Talk)

## HONORS AND AWARDS-----

CS @ Illinois Grace Hopper Travel Grant Fall 2018

Outstanding Teaching Assistant Fall 2015

Outstanding Senior in Computer Science Spring 2012

Outstanding Undergraduate in Computer Science Spring 2012

Member of Upsilon Pi Epsilon Honor Society Inducted: Fall 2011

Member of Phi Kappa Phi Honor Society Inducted: Spring 2011

## SERVICE-----

Member of Undergraduate Research Council, GVSU Fall 2020 – Present

Member of Kindschi Fellowship Review Committee, GVSU Winter 2021 – Present

SIGCSE Student Research Competition Reviewer 2021

GHC Scholarship Application Reviewer 2020

Member of Graduate Study Committee, UIUC Fall 2015 – Spring 2016

## GRANTS-----

Wolffe, G. S. (Principal), Carrier, E. E. (Co-Principal), Funckes, N. Awarded: May 2020  
 "Tag: Autonomous Image Captioning"  
 OURS Student Summer Scholars Program, Grand Valley State University  
 \$6,000.00,

Carrier, E. E. (Principal), Ockerman, S. Awarded: May 2021  
 "Detecting Face Mask Usage Trends in Social Media with Machine Learning"  
 OURS Student Summer Scholars Program, Grand Valley State University  
 \$8,000.00