DANIEL NICHOLS

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2400 16TH ST NW APT 614, Washington, DC, 20009

EDUCATION

University of Maryland, College Park — *June 2020 - Present*
PhD, Computer Science
Advisor: Abhinav Bhatele

University of Tennessee, Knoxville — *August 2017 - May 2020*
Undergraduate — Overall GPA: 3.93/4.0
Computer Science — Major GPA: 4.0/4.0

RESEARCH EXPERIENCE

University of Maryland, College Park — June 2020 - *Present*
In collaboration with Lawrence Livermore National Laboratory — *Graduate Research Assistant*

Lawrence Livermore National Laboratory — Summer 2022 & 2023
Computational Sciences — *Research Assistant*

Innovative Computing Laboratory &
Joint Institute for Computer Science (JICS) — October 2018 - May 2020
Oak Ridge National Laboratory,
University of Tennessee, Innovative Computing Laboratory — *Undergraduate Research Assistant*

JICS REU — May - August 2019
Oak Ridge National Laboratory,
University of Tennessee — *Research Assistant*

COMMUNITY INVOLVEMENT

IEEE Cluster Conference 2022, Web Co-Chair
IEEE TPDS reviewer (x2)
Supercomputing reviewer (x2)
IPDPS reviewer (x2)

ACADEMIC ACHIEVEMENTS

GRFP Honorable Mention
Honors Computer Science, *University of Tennessee, Knoxville*
Honors Engineering, *University of Tennessee, Knoxville*
Dean's List, *University of Tennessee, Knoxville*
Summa Cum Laude, *University of Tennessee, Knoxville*

TEACHING EXPERIENCE

Undergraduate Teaching Assistant — Fall 2019
University of Tennessee

COSC 140 - Data Structures and Algorithms I

PUBLICATIONS

Modeling Parallel Programs using Large Language Models

Daniel Nichols, Aniruddha Marathe, Harshitha Menon, Todd Gamblin, Abhinav Bhatele. arXiv preprint arXiv:2306.17281 (2023).

Porting a Computational Fluid Dynamics Code with AMR to Large-scale GPU Platforms

Joshua H. Davis, Justin Shafner, **Daniel Nichols**, Nathan Grube, Pino Martin, Abhinav Bhatele. IPDPS 2023.

Resource Utilization Aware Job Scheduling to Mitigate Performance Variability

Daniel Nichols, Aniruddha Maratha, Kathleen Shoga, Todd Gamblin, and Abhinav Bhatele. IPDPS 2022.

A Survey and Empirical Evaluation of Parallel Deep Learning Frameworks

Daniel Nichols, Siddharth Singh, Shu-Huai Lin, Abhinav Bhatele. arXiv preprint arXiv:2111.04949 (2021).

Integrating Deep Learning in Domain Sciences at Exascale

R. Archibald, E. Chow, E. D'Azevedo, J. Dongarra, M. Eisenbach, R. Febbo, F. Lopez, **D. Nichols**, S. Tomov, K. Wong, and J. Yin, SMC 2020.

MagmaDNN: Towards High-Performance Data Analytics and Machine Learning for Data-Driven Scientific Computing

Daniel Nichols, Natalie-Sofia Tomov, Frank Betancourt, Stanimire Tomov, Kwai Wong, and Jack Dongarra. ISC High Performance, Workshop 2019.

MagmaDNN: Accelerated Deep Learning Using MAGMA

Daniel Nichols, Kwai Wong, Stan Tomov, Lucien Ng, Sihan Chen, and Alex Gessinger. PEARC 2019.

openDIEL: A Parallel Workflow Engine and Data Analytics Framework

Frank Betancourt, Kwai Wong, Efosa Asemota, Quindell Marshall, **Daniel Nichols**, Stan Tomov. PEARC 2019.

PRESENTATIONS, POSTERS, & TALKS

Probabilistic Package Builds: Guiding Spack's Concretizer with Predicted Build Outcomes

PackagingCon 2023 Talk.
`https://cfp.packaging-con.org/2023/talk/RKDWRC/`

How to build your own Deep Neural Network Framework

Half-day tutorial at PEARC '20. ACM.
`https://pearc.acm.org/pearc20/program/schedule/`

MagmaDNN: Accelerated Deep Learning Using MAGMA

In *Performance Evaluation and Improvement* session at PEARC '19. ACM.
`https://pearc19.conference-program.com/session/?sess=sess196`

Distributed and High Performance Deep Learning

Innovative Computing Laboratory Talk.
`http://icl.cs.utk.edu/newsletter/presentations/2019/Nichols-MAGMADNN-08-30-2019.pdf`

SOFTWARE PROJECTS

Performance Profile Viewer

https://marketplace.visualstudio.com

VSCode Extension

CSscholar

`https://csscholar.github.io/`

CS Publication Data Analysis

MagmaDNN

`https://github.com/MagmaDNN/magmadnn`

high performance deep learning framework

AWARDS & FUNDING

UT Volunteer Scholarship (x3)
Herbert & Lillian Duggan Scholarship
Edgar Wyman Mccall Scholarship (x2)
Dean's Fellowship - UMD
Frederick T Bonham Scholarship
Harlan D Mills Scholarship (x2)
Henry, Robert & Velma Scholarship (x2)

RELEVANT COURSES

Core Courses

Hon. Algorithms and Data Structures I & II
Hon. Discrete Structures
Parallel Computing
Systems Programming
Pattern Recognition
Advanced Algorithms & Data Structures
Compilers
Hon. Calculus I-III
Graph Theory
Probability and Random Variables
Operating Systems
Algorithm Analysis
Matrix Algebra
Mechanism Design for Social Good

RESEARCH STRENGTHS

Computer Languages	C/C++, Python, Julia, Fortran, CUDA, Javascript
Software & Tools	LaTeX, Excel, Mathematica, Matlab, Matplotlib, OpenGL/WebGL
Deep Learning	Tensorflow, PyTorch, MxNet, keras, MagmaDNN
Parallel & Scientific Computing	Spack, LAPACK, BLAS, MAGMA, MPI, OpenMPI, CUDA, LINPACK, OneAPI, NCCL
Community Involvement	Active Math.StackExchange User (∼153k people reached) `math.stackexchange.com/users/274085`
Language	English, German (read & write)