DANNY RORABAUGH

Volunteer Linguistics Software Developer, SIL International
imnasnainaec@gmail.com · imnasnainaec.github.io

OBJECTIVE

To serve God as a "tent-making" missionary, developing software with SIL International for linguistics and Bible translation work.

LANGUAGE SKILLS

Human	Intermediate Spanish (IRL Level 2), with experience in Colombia, Guatemala, Mexico
	Beginner Portuguese (IRL Level 1), with experience in Brazil
Computer	Proficient with Javascript/Typescript, C#, Python, LaTeX, Maple, R
	Familiar with C, Java, Visual Basic, HTML/CSS, MATLAB

EDUCATION

University of South Carolina, Columbia
Ph.D. in Mathematics
Advisor: Joshua Cooper
Research Area: Discrete Mathematics
Graduated: August 2015

Seattle Pacific University, Seattle
B.S. in Mathematics
Advisor: Robbin O'Leary
B.A. in Linguistics with Spanish Emphasis
Advisor: Kathryn Bartholomew
Graduated Summa Cum Laude: June 2010

PROFESSIONAL EXPERIENCE

Volunteer Software Developer May 2020 – present
SIL International, Langauge Software Development *Supervisor: Jason Naylor*

- Part of the team developing The Combine (thecombine.app), a web app for Rapid Word Collection
- Programming in C# (.NET) and Javascript/Typescript (React)
- Using such tools as VSCode, Github, CrowdIn, and TestLodge

Post-Doctoral Research Associate (UTK) Jun 2018 – Feb 2020
Postdoctoral Researcher (UD) Jan – May 2018
University of Delaware, Newark; University of Tennessee, Knoxville *Supervisor: Michela Taufer*

- Research with the Global Computing Laboratory, supported by the following grants
- NSF #1513025, #1841552: A comprehensive methodology to pursue reproducible accuracy in ensemble scientific simulations on multi- and many-core platforms
- NSF #1724843, #1854312: Cyberinfrastructure tools for precision agriculture in the 21st century
- Programmed in Python, R, C; used Jupyter, RStudio, MPI, Apachi Spark, Github, Vim

Adjunct Assistant Professor; Coleman Postdoctoral Fellow Sep 2015 – Dec 2017
Queen's University, Kingston *Postdoc Supervisors: Claude Tardif, David Wehlau*

- Instructor of Record for five terms, teaching the following courses: Differential and Integral Calculus (MATH 121/124), Differential Equations for Electrical and Computer Engineers (MTHE 235), Graph Theory (MATH 401/801)
- Primary research topics: Connections between homomorphisms on relational structures and logical statements, such as choice, filter, and order axioms; The chromatic number of arc graphs and connections with poset

Math Camp Instructor Jul – Aug 2017
A-Star Summer Math Camp, Santa Clara, CA & Weston, MA

- Taught interactive classes of 3-18 students for six weeks, 30 hours per week
- Prepared students from grades 3 through 10 for Mathcounts and AMC contests
- Edited lessons and questions for future camps

Graduate Teaching Assistant Aug 2010 – May 2015
Department of Mathematics, University of South Carolina, Columbia

- Instructor of Record for nine terms, teaching the following lower-division courses: Basic College Mathematics, Precalculus Mathematics, Calculus for Business Administration and Social Sciences, Calculus II, Finite Mathematics

Summer Research Assistant Jun – Jul 2014
University of South Carolina, Columbia *Supervisor: Joshua Cooper*

- Assistive technology project: speech to LaTeX code
- Programmed in Java; used CMU Sphinx, GOLD Parser, NetBeans, Eclipse
- Gained familiarity with the grammars, dictionaries, and acoustic models used in speech processing

RESEARCH PUBLICATIONS

2020:

- A. Bernsteyn, O. Khormali, R. Martin, J. Rollin, D.R., S. Song, and A. Uzzell. "Regular colorings and factors in regular graphs." *Discussiones Mathematicae Graph Theory*, 4:3:795–806.

2019:

- D.R., "A bound on a convexity measure for point sets." *International Journal of Computational Geometry and Applications*, 29:4:301–306.
- D. Chapp, D.R., D. Brown, E. Deelman, K. Vahi, V. Welch, and M. Taufer. "Applicability Study of the PRIMAD Model to LIGO Gravitational Wave Search Workflows." Position paper, *P-RECS'19: 2nd International Workshop on Practical Reproducible Evaluation of Computer Systems.*
- D. Chapp, D.R., K. Sato, D. Ahn, and M. Taufer. "A three-phase workflow for general and expressive representations of nondeterminism in HPC applications." *International Journal of High Performance Computing Applications*, 33:6:1175–1184.
- D.R., M. Guevara, R. Llamas, J. Kitson, R. Vargas, and M. Taufer. "SOMOSPIE: A modular SOil MOisture SPatial Inference Engine based on data-driven decisions." *eScience 2019.*
- D.R. "Graph cover-saturation." *Graphs and Combinatorics* 35:5:1225–1237.

- B. Bjorkman, G. Cochran, W. Gao, L. Keough, R. Kirsch, M. Phillipson, D.R., H. Smith, and J. Wise. "k-foldability of words." *Discrete Applied Mathematics* 259:19–30.

2018:

- D.R., C. Tardif, D. Wehlau, and I. Zaguia. "Iterated arc graphs." *Commentationes Mathematicae Universitatis Carolinae* 59:3:277–283.
- D. Chapp, D.R., and M. Taufer. "Modeling Record-and-Replay for Nondeterministic Applications on Exascale Systems." Position paper, *ModSim 2018*.
- J. Cooper and D.R.. "Density dichotomy in random words." *Contributions to Discrete Math.* 13:1.

2017:

- D.R., C. Tardif, and D. Wehlau. "Logical compactness and constraint satisfaction problems." *Logical Methods in Computer Science*, 13:1:1:1–11.

2016:

- J. Cooper and D.R. "Asymptotic Density of Zimin Words." *Discrete Mathematics & Theoretical Computer Science* 18:3#3.

2015:

- D.R. "Toward the Combinatorial Limit Theory of Free Words." University of South Carolina, ProQuest Dissertations Publishing.

2014:

- J. Cooper and D.R. "Bounds on Zimin Word Avoidance." *Congressus Numerantium*, 222:87–95.

INVITED RESEARCH TALKS

- "Cyberinfrastructure for Scientific Discovery with Emphasis on Wildfire Simulations" (50 min)
  Fire Research Division seminar, NIST, Gaithersburg — 20 Mar 2019
- "A Workflow for Soil Moisture Analytics" (20 min)
  Innovative Computing Lab seminar, University of Tennessee, Knoxville — 15 Mar 2019
- "Integer Sequences" (50 min)
  Mathematics and Statistics Colloquium, Colby College, Waterville — 11 Oct 2018
- "Graph domination-saturation" (50 min)
  Combinatorics, Algebra, and Topology Seminar, US Naval Academy, Annapolis — 23 Apr 2018
- "Combinatorial Nullstellensatz in Graph Theory" (20 min)
  AMS Sectional Meeting, University of Buffalo, Buffalo — 17 Sep 2017
- "Bridging Logic and Constraint Satisfaction with Relational Structures and Filters" (60 min)
  Logic, Combinatorics Seminars (combined), McGill University, Montréal — 4 Nov 2016
- "Antimagic Graphs and Combinatorial Nullstellensatz" (60 min)
  Discrete Mathematics Seminar, University of Colorado Denver — 29 Sep 2014
- "Collatz Generalized: An Expansion of the $3x + 1$ Problem" (30 min)
  11th Carolina Math Seminar, Benedict College, Columbia — 2 Feb 2012

ACADEMIC AWARDS AND HONORS

- $52,115 of computational resources on Jetstream; two XSEDE allocations:
  Co-P.I. on TRA180041 (Educational) for a graduate C.S. course — Aug 2018 – Feb 2020
  P.I., on EAR180011 (Startup) for soil moisture research — Jul 2018 – Jan 2020
- Outstanding Graduate Student of 2014–15, Mathematics Dept, USC, Columbia — Apr 2015
- Meritorious Winner, *COMAP Mathematical Contest in Modeling* — Apr 2010
- Roughly $15,000 in travel support for 20 conferences and 2 collaborations (on top of the following)

Research Workshops, Fully-funded Participant

- *Argonne Training Program on Extreme-Scale Computing*
  Q Center, St. Charles, Illinois — Jul – Aug 2018
- *SP School of Advanced Science on Algorithms, Combinatorics and Optimization*
  Instituto de Matemática e Estatística, Universidade de São Paulo — Jul 2016
- *LMS-CMI Research School: Regularity and Analytic Methods in Combinatorics*
  University of Warwick, Coventry — Jul 2015
- *Rocky Mountain-Great Plains Graduate Research Workshop in Combinatorics*
  Iowa State University, Aimes — Jun 2015
- *Rocky Mountain-Great Plains Graduate Research Workshop in Combinatorics*
  University of Colorado Denver and University of Denver — Jul – Aug 2014
- *Graph Limits, Groups and Stochastic Processes*
  Rényi Institute of Mathematics, Budapest — Jun – Jul 2014
- *UA VIGRE: Arizona Summer Program on Computational Photonics*
  University of Arizona, Tucson — Jul 2009

VOLUNTEER & EXTRACURRICULAR ACTIVITY

- Website Administrator, Sandy Springs Orthodox Presbyterian Church — Feb 2021 – present
- Editor-in-Chief, The On-Line Encyclopedia of Integer Sequences — Oct 2015 – present
- Sunday School Teacher (monthly), Redeemer Church of Knoxville — Oct 2019 – Feb 2020
- Board Game Event Organizer (quarterly), Global Computing Lab, UD & UTK — Jan 2018 – Jan 2020
- Children's Program (monthly), Redeemer Church of Knoxville — Jan – Jul 2019
- Four-time peer reviewer, various math and computer science journals — May 2016 – Apr 2019
- Contributor of 24 talks, various math and computer science conferences — Apr 2010 – Apr 2019
- AV Technician (monthly), Calvary Baptist Church, Newark — Mar – May 2018
- Children's Program (monthly), Polson Park Free Methodist Church, Kingston — Jan 2016 – Dec 2017
- Board Game Event Organizer (quarterly), Math & Stats, Queen's University — Dec 2015 – Nov 2017
- Associate Editor, The On-Line Encyclopedia of Integer Sequences — Apr – Oct 2015
- Webmaster & Secretary, SIAM Chapter, USC Columbia — Apr 2014 – Aug 2015
- AV Technician (monthly), St. Andrews Evangelical Church, Columbia — Apr 2012 – Jun 2015
- Organizer, Graduate Seminar in Discrete Mathematics, USC Columbia — Aug 2014 – Apr 2015
- Maintenance (am); Kid's Program (pm), Seminario Bíblico de Colombia, Medellín — May – Aug 2013