Curriculum Vitae

Devin Robert Wright

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Education

Dual/Joint Doctor of Philosophy (Ph.D.), Informatics (Complex Networks & Systems) & Cognitive Science
August 2022 – Present
Indiana University–Bloomington, Bloomington, Indiana, USA

Bachelor of Science (B.S.), Computer Science
May 2018 – December 2021
Utah Valley University, Orem, Utah, USA
GPA 3.83 – Magna Cum Laude

Associate of Science (A.S.), General Studies
April 2017
Brigham Young University–Idaho, Rexburg, Idaho, USA

California State University Long Beach, Vocal Performance, August 2010 – December 2010

Certifications:

Programmer, August 2021
Utah Valley University, Orem, Utah, USA

Research Interests

1. The cognitive science of religion and cultural evolution.
   - ❖ How do religion and narrative affect cultural evolution?
   - ❖ What is the epistemological role of collective narratives and worldviews?
   - ❖ By what mechanisms does our mind process and reconstruct various narratives?
   - ❖ How does cultural evolution drive the evolution of narratives (religious or otherwise)?
   - ❖ What is the role of novelty in the evolution of narratives?
2. Patterns of novel thinking, collaboration, information spreading, and cooperation.
   - ❖ Aim to understand how narrative structures or religious practices affect these patterns in social/collective/individual cognition.
3. The development of NLP and NLU methods for computational analysis related to these lines of inquiry.

I plan to improve pro-social and innovative aspects of various communities by understanding their community structure, the effects of common/shared narratives, and cultural/narrative evolution. I also plan to improve and develop novel NLP/NLU methods to aid in these endeavors.

Publications

Journal Publications

1. Fritz Breithaupt, Ege Otenen, Devin R. Wright, John K. Kruschke, Ying Li, and Yiyan Tan. "Humans create more novelty than ChatGPT when asked to retell a story." *Scientific Reports 14, 875*, January 2024. (Breithaupt, Otenen, Wright, and Kruschke are equal first authors)

Academic Conference Publications

2. Devin Robert Wright, Tim Severance, Charles D. Knutson, Jonathan L. Krein, Tyler D. Buchanan. "An Autonomous Discord Bot to Improve Online Course Experience and Engagement: Lessons Learned Amid the COVID-19 Pandemic." *Proceedings of the IEEE Conference on Software Engineering Education and Training (CSEE&T)*, Maui, Hawaii, January 4-7, 2022.

Preprints

3. Devin R. Wright, Fritz Breithaupt, Yong-Yeol Ahn. "The Fit Get Fitter: How Cultural Bias and False Cultural Priors Could Help Individuals and Communities Learn More About the World." *Submitted*, January 2024.
4. Elise Jing, Simon DeDeo, Devin Robert Wright, Yong-Yeol Ahn. "Sameness Entices, but Novelty Enchants in Fanfiction Online (Version 2)." arXiv, August 2023.

Presentations

1. Midwest Cognitive Science Conference 2023. Grand Rapids, Michigan. May 7-9, 2023. "Man vs. Machine: What ChatGPT Reveals about Human Memory, Emotion, and Creativity in the Serial Reproduction of Stories."
2. NASA Virtual Intern Symposium, Summer 2021. Virtual–Greenbelt, Maryland, Aug 10, 2021. "Using Natural Language Processing and Machine Learning to Identify Trends in Flight Software Patch History."
3. National Conference on Undergraduate Research 2021@home. Virtual, April 13, 2021. "Constructing an Assembler and Virtual Machine."
4. Utah Conference on Undergraduate Research 2021, hosted by Brigham Young University, Provo, Utah. Virtual–Provo, Utah, February 19, 2021. "Constructing an Assembler and Virtual Machine."
5. Ames Virtual Intern Poster Symposium and Exit Presentation Series, August 2020. Virtual–Mountain View, California, Aug 5, 2021. "Improving Plan Specification Language Usability and Applying Language to Model Autonomous Interplanetary Communications."

Service in Profession

Conducted Peer Review for the Following Journals and Conferences

1. Nature: Humanities & Social Sciences Communications
2. Hawaii International Conference on System Sciences (HICSS-56)

Research Experience

Ph.D. Student (Aug 2022 – Present)
YY Group, Indiana University, Department of Informatics, Bloomington, Indiana
Experimental Humanities Lab, Indiana University, Cognitive Science Program, Bloomington, Indiana

- Co-Advisors:
  - Yong-Yeol Ahn (Informatics)
  - Fritz Breithaupt (Cognitive Science)
- Designed multiple experiments and research plans, including both leading and supporting roles.
- Used word sense disambiguation to analyze synsets in the serial reproduction of stories. Contucted analysis using the most abstract root hypernym synsets, specific synsets, and lemmas to understand concept stability, decay, and creativity in the serial reproduction of stories by humans and ChatGPT.
- Conducted research using multi-agent computational models/simulations to understand the role of false collective narratives/worldviews in understanding the world.
- Conducted analysis on a fanfiction dataset from AO3 to understand how novelty relates to enjoyment by looking at how kudos relates to hits. (enjoyment relates to consumption)

- ❖ Currently collecting data from various sources to have a comprehensive dataset on Latter Day Saints (an american founded religious group) to understand the role of distributed cognition in cultural evolution for religious groups.
- ❖ Used sentence and short-story embeddings to analyze semantic similarity or survival between the serial reproduction of narratives. Also investigated methods to analyze the shape of these stories within the embedding space.
- ❖ Used information theory to investigate how entropy or information changes across generations of serial reproduction. Additionally, researched the relative entropy between generations of retellings.
- ❖ Researched how features such as affect (emotion), strength of affect, gender, education, reading patterns, etc., influence semantic survival and information patterns.
- ❖ Researched zero-shot classification methods for emotion detection in narratives.

Research Assistant – Volunteer (Aug 2021 – Apr 2022)
YY Group, Indiana University, Department of Informatics, Bloomington, Indiana
- ❖ Researched the interaction between human belief networks and social contagion, focused on optimal modularity in a belief network with Rachith Aiyappa, an Indiana University Ph.D. student advised by Indiana University Professor, Yong Yeol Ahn. Gained exposure to principles in network science, complex systems, neural networks, simple contagion, and complex contagion in social systems.
- ❖ Contributed to BeliefNet repository by writing documentation and instructions to set up both local and docker environments. Created quickstart scripts to facilitate easy setup for docker users. Both documentation and instructions will help with reproducibility.

Research Associate – Internship (Apr 2021 – Jun 2021)
Ironwood Experts, LLC, Alpine, Utah – *UVU Source Code Lab,* Orem, Utah
- ❖ Led a team of three undergraduate researchers at Utah Valley University under the advisement of Professor Charles Knutson and Dr. Jonathan Krein. We conducted research on the development of automated and asynchronous attendance-tracking methods for remote learning. We also researched their benefits to student behavioral engagement within university computer science courses. This research resulted in a paper published at CSEE&T in January 2022.
- ❖ Conducted research on the modifications to Computer Science course pedagogy in response to the COVID-19 pandemic. Identified benefits of various software platforms for use in university settings.
- ❖ Conducted research on the accessibility and user experience of various simulators for teaching computer organization and architecture to undergraduate students.

Research Assistant – Volunteer (Oct 2019 – Dec 2021)
UVU Source Code Lab, Utah Valley University, Computer Science Department, Orem, Utah
- ❖ Charter member – Recruited several original members, some of which are still current members.
- ❖ Assisted in obtaining funding through an Ironwood Experts, LLC Research Associate internship program by demonstrating the need to improve online course experience and engagement during the COVID-19 pandemic. Accomplished by conducting research in free time and developing a prototype for an autonomous application to track attendance in online classes.
- ❖ Researched new methods for teaching Assembly Language to University students.
- ❖ Conducted research in source code analysis and empirical research methods.
- ❖ Investigated machine learning algorithms for static software analysis.

Industry Experience

NASA OSTEM Intern - Data Scientist (Jun 2021 – Aug 2021)
National Aeronautics and Space Administration – Universities Space Research Association
Goddard Space Flight Center, Greenbelt, Maryland
- ❖ Used Machine Learning and Natural Language Processing methods to identify development patterns within flight software patch history.
- ❖ Discovered that the majority of development time was spent on testing during patches.
- ❖ The majority of patch comment status data referred to administrative, collaborative, and testing topics, while a small minority of the data was strictly technical or specific to patched systems.

- ❖ Uncovered Author contribution patterns to patch comments. Generally, each mission had a core team while others appeared to be minor contributors. This was true for all missions together as well, however, this only pertained to authors of patch comments.
- ❖ Developed a web scraper to obtain 30 years of patch comment data left by NASA engineers over approximately 30 missions from HTML.
- ❖ Handled all data cleaning and preparation tasks before ML algorithms were utilized.
- ❖ The ML/NLP method used was Topic Modeling (Latent Dirichlet Allocation) to model topics across missions.
- ❖ Identified other datasets for analysis, and more analysis methods that could be used to learn more, such as sentiment analysis.
- ❖ Used Docker containers to make the NLP/ML development environment easy to set up for other engineers.
- ❖ Worked on the NASA core Flight System (cFS). Researched and implemented some caching within the CI pipeline to speed up performance between jobs in GitHub Actions.

NASA Summer Intern - Computer Scientist (May 2020 – Aug 2020)
National Aeronautics and Space Administration – Universities Space Research Association
NASA Ames Research Center, Mountain View, California

- ❖ Ocean Worlds Autonomy Testbed for Exploration Research and Simulation (OceanWATERS):
  - ➢ Developed and modeled autonomous interplanetary communications simulations using the Robot Operating System (ROS) and PLEXIL.
  - ➢ Implemented simple simulation parameters to control simulation time and decisions on the ground.
  - ➢ Researched how to speed up overall simulation time to run simulations lasting multiple sols.
  - ➢ Worked on Windows Subsystem for Linux (WSL) compatibility with OceanWATERS.

- ❖ Plan Execution Interchange Language (PLEXIL):
  - ➢ Worked on improving the language, which was originally developed by researchers at NASA and Carnegie Mellon University.
  - ➢ Developed a custom editing support extension in Emacs for the PLEXIL language.
  - ➢ Converted LISP-based PLEXIL apps to standard PLEXIL syntax.
  - ➢ Refactored sample application to use C++ style programming and some simple design patterns.
  - ➢ Worked on WSL compatibility with PLEXIL.
  - ➢ QA and software testing of PLEXIL and its various applications.

Instructional and Academic Experience

Instructor of Record:

Adjunct Faculty Instructor - Computer Science – Spring 2022 **(**Dec 2021 – Aug 2022)
Utah Valley University, Computer Science Department, Orem, Utah

- ❖ Computer Organization and Architecture – *Spring 2022, Summer 2022*:
  - ➢ Taught undergraduate courses on Computer Organization and Architecture covering basic concepts of computer organization. It consisted of material on number systems, CPU organization, instruction sets, programming in assembly and machine language, memory organization, debugging, program design, and documentation. Covered interrupts, vector tables, and disk I/O. This will be accomplished using LC-3 architecture and simulators.
- ❖ Introduction to Algorithms and Data Structures – *Summer 2022*:
  - ➢ "Uses data abstraction to design and implement modular programs of medium size and complexity. Structures solutions to problems using common data structures and algorithms such as advanced arrays, lists, stacks, records, dynamic data structures, searching and sorting, vectors, trees, linked lists, and graphs. Evaluates alternative solutions to problems. Analyzes algorithmic complexity metrics in Big-O notation."UVU Course Description
- ❖ C++ Programming – *Summer 2022*:

- ➢ "Introduces C++ programming for students with prior programming experience. Covers language fundamentals, core standard library components, error handling, value semantics, pointers and memory management, object-oriented programming, and templates." UVU Course Description
- ❖ Instructed and tutored students.
- ❖ Planned and organized the courses.
- ❖ Provided lectures and evaluated students' performance on class material.

Student Academic Appointee Roles:

Associate Instructor - Informatics (Aug 2022 – Present)
Indiana University–Bloomington, Informatics Department, Bloomington, Indiana

- ❖ Data Fluency – *Spring 2023, Spring 2024*:
  - ➢ INFO-I123: with Professor Staša Milojević
  - ➢ "Data is big. Data is everywhere. How can we possibly be expected to keep up in a world full of data, much of which is data about ourselves? This class provides fundamental skills for the 21st century: understanding data, extracting knowledge from data, generating predictions from data and presenting data." IU Course Description
- ❖ The Information Society – *Fall 2023*:
  - ➢ INFO-I222: with Professor Nathan Ensmenger
  - ➢ "We are often told that we are living in an “Information Society," and indeed, this is a truth that seems self-evident: communications and information technologies increasingly pervade our homes, our workplaces, our schools, even our own bodies. But what exactly do we mean when we talk about the “Information Society”? If we are living in an Information Society, when did it come into being? What developments — social, economic, political, or technological — made it possible? How does it differ from earlier eras? And finally, and most significantly: what does it all mean?

    This course will explore the ways in which Western industrialized societies, over the course of the previous two centuries, came to see information as a crucial commercial, scientific, organizational, political, and commercial asset. Although at the center of our story will be the development of new information technologies — from printing press to telephone to computer to Internet — our focus will not be on machines, but on people, and on the ways in which average individuals contributed to, made sense of, and come to terms with, the many social, technological, and political developments that have shaped the contours of our modern Information Society. Our goal is to use these historical perspectives to inform our discussions about issues of contemporary concern about information technology. " IU Course Description
- ❖ Data Visualization – *Fall 2022, Summer 2023*:
  - ➢ INFO-I590, INFO-I422: with Professor Yong-Yeol (YY) Ahn
    Graduate and undergraduate courses
  - ➢ 3 sections with nearly 200 undergraduate and graduate students for Fall semester.
  - ➢ "From dashboards in a car to cutting-edge scientific papers, we extensively use visual representation of data. As our world becomes increasingly connected and digitized and as more decisions are being driven by data, data visualization is becoming a critical skill for every knowledge worker. In this course we will learn fundamentals of data visualization and create visualizations that can provide insights into complex datasets." IU Course Description
- ❖ Conducted short lectures and workshops/tutorials
- ❖ Tutored and held office hours for students.
- ❖ Modified coursework and labs.
- ❖ Assisted in all managerial tasks.
- ❖ Graded assignments, labs, projects, papers, and exams.

Assistant Roles:

Teaching Assistant/Grader (Aug 2019 –Dec 2021)
Utah Valley University, Computer Science Department, Orem, Utah

- Compiler Construction – *Fall 2021*:
  - Tutored students on methods for compiler construction.
  - Evaluated and graded students one-on-one on their individually built compilers for an object-oriented language called "kxi."
  - Designed and developed tests to evaluate full functionality of student compilers.
  - Provided feedback and suggestions to the professor on course organization.
  - Position is generally reserved for graduate students, but was hired as an undergraduate student.
- Global Social and Ethical Issues in Computing – *Fall 2020, Spring 2021, Fall 2021*:
  - Designed and developed an application to automate class attendance which runs on a local Raspberry Pi server, and maintained/managed the server. This work was published at CSEE&T in January 2022. The application was utilized in and developed for this course and Principles and Patterns of Software Design.
  - Instructed and tutored students to help improve their writing.
  - Assisted professor in course development, revisions, and planning.
  - Assisted professor in literature choices for the course.
- Principles and Patterns of Software Design – *Spring 2021*:
  - Assisted professor in course revision and development.
  - Created assignments and assisted with class structure.
  - Evaluated student proficiency in coding practices commonly referred to as GoF design patterns.
  - Tutored students on class material.
- Computer Organization and Architecture – *Fall 2019, Spring 2020, Fall 2020*:
  - Instructed and tutored students in one-on-one sessions on LC-3 architecture and assembly language programming.
  - Assisted professor in course development and planning.
  - Investigated course revisions for Raspberry Pi hardware platform (ARM Architecture).

Other Software Development Experience

Virtual Machine and Compiler Construction (Aug 2020 – May 2021)
Utah Valley University, Orem, Utah

Constructed a fully functional compiler for an object-oriented language called "kxi" from scratch. The language is capable of functions, recursion, objects, arrays, statements, and expressions. The kxi code is compiled down to an assembly language that runs directly on a virtual machine with a RISC-based architecture; which was also constructed from scratch. In addition to the capabilities required by the compiler, the virtual machine is capable of multithreading. Work on constructing the virtual machine was presented at the National Conference on Undergraduate Research and the Utah Conference on Undergraduate Research.

Grad "Fit" Finder (Aug 2020 – May 2021)
Personal Project, Orem, Utah

Constructed a simple program to help students find and choose graduate programs that best "fit" them. The program looks at various data, such as interest in research, interest in specific professors, research quality, living factors, cost factors, and personal desire factors, etc. The user is also able to define what aspects are most important to them in a graduate program. The program will then give a score to each of the graduate programs with weights according to aspects most important to the student. The program gives the student multiple lists based on different categories with the best-scored schools at the top of the lists.

This tool was made with the intention to eventually release as an open-source tool for students with less

academic privilege, such as first-generation or non-traditional students like myself. I hope it will eventually help students unfamiliar with what they should consider when choosing graduate programs. Personally, I used this program myself in its current state to assist me in selecting a graduate program.

School Organizations and Clubs

Member, CFO, UVU Developers Club (Nov 2018 – May 2019)
Utah Valley University, Orem, Utah

Strengthened software development skills through competitive software coding and optimization challenges and managed organizational finances. Met with experienced software developers and technology leaders.

Reporter, Journalist for *"Scroll"* (Apr 2015 – Jul 2015)
Brigham Young University–Idaho, Rexburg, Idaho

Strengthened writing skills by attending various events happening at the university and reporting on these events in the form of press releases and news articles. Gained experience on scheduling, designing, and conducting interviews.

Foreign Languages

Portuguese: Fluent in reading, writing, and speaking. Lived in Brazil for just over a year.

Volunteer Experience

Missionary (Apr 2013 – Mar 2015)
The Church of Jesus Christ of Latter-day Saints, Salt Lake City, Utah
St. George, Utah - Apr 2013 – Mar 2014
São Paulo, Brazil - Mar 2014 – Mar 2015

St. George, Utah:

- Regional Director: Responsible for training, developing and managing four teams of volunteers. Performed, organized, and led volunteer humanitarian and faith-based service in the form of community outreach, charitable support, compassionate care for the elderly and sick, and education and awareness.

São Paulo, Brazil:

- Regional Director: Responsible for three teams of volunteers.
- New Volunteer Trainor/Mentor: Responsible for the training and overall physical, mental, and spiritual well-being of new volunteers.
- Learned to speak, read, and write the Portuguese language fluently.

English Tutor/Teacher (Brazil):

- Volunteered to teach free basic English courses to classes ranging from 10-25 persons.

Awards and Scholarships

Dean's List (Multiple) - Received Dean's List Honors, Spring 2021, Fall 2020, Spring 2020, Fall 2019, and Fall 2018.

Finalist in Last Voice Standing at BYU-I (Jul 2015) - Finalist in a competition against other vocalists at BYU-I where each week contestants were given a different vocal challenge.

Bob Cole Conservatory of Music Scholarship (Aug 2010) - Awarded for vocal performance ability with purpose to study music at California State University Long Beach.

Music Recordings, Performance Experience, and Training

Hushwreck - Band (2010 - Present) - Wrote, recorded, produced and performed music. Wrote instrument parts for recordings, played guitar and sang lead vocals for live performances. Handled all live show scheduling, online talk show appearances, and financial affairs. Limited activity in present years.

Abaddon - Single by Hushwreck (February 2023) - Wrote, produced, and recorded a Death Metal/Djent/Progressive Metal track. Performed and programmed all instrument and vocal performances. Available on all music streaming services.

Aquamarine - Single by Friends + Family [*formerly known as Ever Chasing Daylight*] (2022) - Featured as a guest vocalist on this single. Performed/recorded vocals for the bridge (1:45-2:15), some of the background vocals, and all of the harsh vocals (a.k.a. "screams"). Available on Spotify.

Seasons - Single by Friends + Family [*formerly known as Ever Chasing Daylight*] (2020) - Featured as a guest vocalist on this single. Performed/recorded harsh vocals (a.k.a. "screams") and "gang" vocals (vocals that sound like many voices chanting or yelling at once). Available on Spotify.

Technicolor - EP by Hushwreck (January 2012) - Wrote, produced, and recorded an EP with various genres of music including alternative, acoustic, metal, and dubstep. Performed all vocals and instruments besides drums. Recorded at JSM Studios in Fresno, California. Available on all music streaming services.

Private Voice Lessons (August 2007 - December 2010) - Took private lessons from a local voice teacher until 2010 where I took state-funded voice lessons for vocal performance majors at BCCM-CSULB.

Choir (August 2001 - December 2010) - Participated and performed year-round in choirs. Choir types included chamber choirs, men's choirs, jazz choirs, barbershop quintets, and concert choirs, both high school and university levels. Performed in various locations around California and the United States such as the Save Mart Center and Carnegie Hall. Selected and performed in various California All-State honor choirs, regional honor choirs, and director-selected combination honor choirs.

Uniamo in Amore by Kevin Memley (December 2010, performed May 2010) - Piece was composed by Kevin Memley specifically for the CEHS Concert Choir and the voices of the 3 soloists; Devin Wright (Tenor), Katherine Simmons (Alto), and Constantine Pappas (Baritone). Recording can be found on YouTube.

Musicals, Plays, and Improv (2008 - 2010) - Performed in various musicals, plays, and competition improv teams. Included both school-sponsored and community productions.

Other Work Experience

Canvasser (Jan 2018 – Apr 2018)
Grassroots Utah Strategies Inc. - Better Boundaries, Salt Lake City, Utah
- ❖ Gathered signatures for Better Boundaries petition. Informed voters on the issue at hand and offered the opportunity to sign the petition. Efforts were successful as the issue was placed on voting ballots in 2018.

Field Investigator (Aug 2017 – Dec 2017)
Resources West Investigations, Clovis, California
- ❖ Researched and investigated workers' compensation claims.
- ❖ Produced detailed reports on facts and observations with respect to claim validity.

Construction Worker (Oct 2016 – Jul 2017)
Wheelhaus, Salt Lake City, Utah – Construction Site: Idaho Falls, Idaho
- ❖ Built tiny homes – trim, framing, flooring, cabinetry, gas lines, etc.

Field Investigator (Apr 2008 – Aug 2016)
Resources West Investigations, Clovis, California
- ❖ Researched and investigated workers' compensation claims.
- ❖ Produced detailed reports on facts and observations with respect to claim validity.
  (Remained at the company, but did not work here during volunteer missionary service.)

Other Interests

Besides vocal performance, plays guitar, bass, and drums. Dabbles in other instruments such as piano, ukulele, cavaquinho, and mandolin. Experience in recording/mixing/mastering music. Enjoys building and modifying desktop computers.