RYAN B. HARVEY

Coder, Datahead, Educator, Wonk, Dad

Curriculum Vita

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https://CodeAndData.codes

Online Profiles

https://people.loyno.edu/~rharvey

https://github.com/nihonjinrxs

https://linkedin.com/in/ryanbharvey

https://twitter.com/CodeAndData

References

Professional

Gavin Hall
Former Chief Technology Officer @ TED
561-601-4295 • gavin.hall@gmail.com

Michael Twentyman
Former Director of Engineering @ TED
518-423-8832 • mike@thirdfloorstudios.com

Phil Wenger
Budget Systems Branch Chief @ OMB
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Personal

Rev. Elizabeth Lott
Sr Pastor @ St Charles Ave Baptist Church
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Who is Ryan?

I'm a fun-loving geek who is driven to create useful things (mostly with code) almost as much as I am called to teach others how to do it themselves. I'm passionate about clean, purposeful interfaces and joyous user experiences. I enjoy diving into data and have been known to get lost in SQL at times. I read lots of books, but never seem to get through my reading list. I'm a happy husband and father of two.

Education and Training

Johns Hopkins University on Coursera, coursera.org

Specialization (non-credit): Executive Data Science - data science management (Mar 2016)

University of Maryland, College Park, MD

Ph.D.: Applied Maths, Applied Stats & Scientific Computing (candidacy Jun 2010; not completed)
Certificate (non-credit): Innovation Management (May 2010)
M.S.: Applied Mathematics & Scientific Computing (Dec 2007)
Graduate Certificate: Scientific Computing (Aug 2007)
Graduate Certificate: Computational Harmonic Analysis (Aug 2007)

Loyola University, New Orleans, LA

B.S.: Mathematics & Computer Science (May 2001)

Online Courses: Various on software development, data science, machine learning, and other topics

Professional Experience

Senior Software Engineer, Healthify

Remote / New York, NY *March 2021-present (full-time)*

I'm a member of the Engineering team at Healthify, a startup enabling organizations to address the social determinants of health by providing solutions for identifying social needs, searching for social services, and coordinating care with an integrated network of community partners to improve outcomes.

- Prototyped in-app self-serve reporting feature long requested by customers, then began building it.
- Enabled the team by significantly improving speed and reliability of CI, deploys, and ELT processes.

Adjunct Instructor, Loyola University New Orleans

Onsite & Remote / New Orleans, LA *Dec 2016-present (4 years, part-time)*

As an Adjunct Instructor, I teach upper level undergraduate computer science courses. In a volunteer capacity, I assist the Department of Mathematics & Computer Sciences with computer science curriculum development, project ideas, community partnerships, and research.

- Developed and taught COSC A451 Software Engineering program capstone course in a service learning mode, engaging students with real-world projects for government and non-profit partners
- Developed and taught COSC A319 Internet Technologies elective course covering Internet fundamentals, protocols and Internet-based software development

Data Scientist & Software Architect, Kitchology Inc.

Remote / Germantown, MD *Jun 2013-present (7 years, part-time)*

As part of a small tech team at this startup, I develop machine learning and data analysis algorithms for food and recipe science. I also wear any other hat needed, from server and database management to launch planning to business process and software architecture.

- Built out AWS deployment infrastructure for application services
- Developed and proved database schema supporting multiple applications and data analysis services
- Architected services-based application delivery using containerized deployment
- Setup continuous integration services for development use by staff and contractors

Skills

Human Languages:
English (native), Japanese (working conversation, limited reading/writing)

Academic Fields:
Computational Harmonic Analysis, Software Engineering, Distributed Computing, Machine Learning

Management & Leadership:
Visioning, Strategic Planning, Public Speaking, Agile Project Management

Computer Languages:
JavaScript/Node.js, Ruby, R, Go, SQL, Python, HTML, CSS, Elixir, Java, C, MATLAB, SAS

Databases:
PostgreSQL, MySQL, SQLite, IBM DB2, MongoDB, Amazon RedShift, Neo4j

Operating Systems:
Apple macOS, Linux (various; Ubuntu preferred), Microsoft Windows

Packages & Frameworks:
Express, React, Rails, Sinatra, Shiny, Plumbr, Flask, Phoenix, NumPy, SQLAlchemy, and others

Media Creation Software:
Google G Suite, DaVinci Resolve 16, Adobe Creative Suite, Apple Keynote, Prezi, Inkscape, The GIMP

Details can be found on my website: https://CodeAndData.codes, and pages linked from there.

Professional Experience (continued)

Senior Backend & Data Engineer, TED Conferences

Remote / New York, NY *Aug 2016-March 2021 (4 years, full-time)*

In this position on TED's Technology Team, I build processing pipelines and products for TED's web presences and for the organization's internal tools and reporting. I spent about two years on the Analytics Squad, after which I've been working in the Video Squad.

- Built a user recommendations API that serves recommendations for over 10 million subscribed users
- Built and maintain the open source @tedconf/fessonia Node.js library for integrating FFmpeg
- Built an automated, Dockerized encoding process integrated with our asset management system

Research Affiliate, University of Maryland

Remote / College Park, MD *Jun 2014-Jun 2019 (5 years, part-time)*

I was a research affiliate in the Norbert Wiener Center for Harmonic Analysis and Applications, housed in the Department of Mathematics. I occasionally collaborated with NWC staff on research in applications of harmonic analysis, mostly in the areas of machine learning, signal processing, and dimensionality reduction of large data sets.

- Carried out self-directed research and collaborated with faculty on research into manifold learning methods for dimensionality reduction of large data sets, data compression, and signal processing
- Researched and created MATLAB- and C-based software for blind sound source separation using Kalman-based modulation filter banks modeling how the brain's auditory cortex processes sound cues

IT Project Manager, Executive Office of the President

Onsite / Washington, DC *Apr 2012-Aug 2016 (4 years, full-time)*

In the Budget Systems Branch of the Office of Management and Budget, I was responsible for the development of our data collection platforms, including a next generation data collection platform composed of Java EE-based micro-services, that facilitate government-wide data collections and enable the development and publication of the President's Budget. I made sure our 180,000+ users were happy and ensured that all the must-have features were complete within the impossible timelines allocated. I was also responsible for our UX design team, delivering style guidance, prototypes and coded front-end solutions across many of our 50+ web applications. In addition, I managed a few other web apps, wrote lots of SQL, and improved our development and project management tools and processes.

- Built and delivered a map-based display of community programs information on the White House website front page which was covered by Wired magazine
- Managed development and improvement of a suite of collaboration applications, leading several cross-functional teams of contractors and in-house technical staff in work on over 50 applications
- Developed, delivered and began implementation of a multi-year software architecture shift to cloud-capable services, including hardware and networking transition, application software architecture and interface specification, service transition and launch planning, CI/CD automation, and security, monitoring and maintenance planning

Hardy-Apfel IT Fellow, Social Security Administration

Onsite / Baltimore, MD & Washington, DC *Mar 2009-Mar 2012 (3 years, full-time)*

In this rotational leadership development program, I impacted each major program the agency runs. I led a research effort on health IT to improve disability claims processing, facilitated the development of the agency's strategic plan, developed communications for the agency CIO, led several web-based communications and full-stack development efforts in the Office of Open Government, and wrote software to model effects of retirement program policy for the Office of Policy Analysis.

DSP Analyst & Software Engineer, BAE Systems

Onsite / Washington, DC *May 2006-Feb 2009 (3 years, full-time)*

In the Sensor Systems division's Advanced Technologies group, I developed software and associated mathematics and algorithms for DARPA-funded research projects using such technologies as VLF controlled-source EM sensing, tomography, compressed sensing, GPS tracking, and noise reduction.

Papers

A Survey of Research on the Use and Development of Physical Models and Nonlinear Dynamics for Music and Sound Synthesis

Master's Degree Scholarly Paper, University of Maryland, May 20, 2004.

The attempt of this paper is to give an overview of previous research in the field of sound and music synthesis using physical models of musical instruments and studies of the nonlinear dynamics of those models. Models considered are limited to those instruments producing sustained tones. Chua's circuit, and its generalization, Chua's oscillator, are described and detailed, including many of the dynamical phenomena associated with them. Musical concepts important to the models are discussed, as well as the time-delayed Chua's circuit and its usefulness as a candidate for a synthesizing standard. Prospects for future research are also discussed.

Available online: https://drive.google.com/file/d/1CzzZ4YDmxaYRshbAKUVwbRBZftq9mXFA05mRFfqbw_Kdy-JAiRIauDGiXrzm

Simulation of a Multiprogramming System Using a Multiple Processor Model

First Southern Symposium on Computing, University of Southern Mississippi, Dec 4, 1996.

The field of multiple processor computer systems has experienced extensive growth in recent years. In order to operate these systems practically, an operating system or extensions must be developed to adequately handle multiple processors. In this paper, several versions of a multiprogramming multiprocessor system are simulated.

Available online: https://drive.google.com/file/d/0B4O3Qws0_CejM0xQcmNlTHpkcUU

Talks

Evolving Fessonia: An update on the Fessonia ffmpeg interface library for Node.js

(Lightning Talk) Demuxed, Online, October 29, 2020.

In this 3-minute lightning talk, I gave a quick recap of a prior talk and provided some updates on the evolution of the library since its 2019 introduction.

- Video: http://bit.ly/evolving-fessonia-video
- Slides: http://bit.ly/evolving-fessonia-slides
- Library: https://www.npmjs.com/package/@tedconf/fessonia

Evolving an API to Match a Conceptual Model: Expressing ffmpeg in JavaScript

NoFUN: New Orleans Functional Programming, New Orleans, LA, February 4, 2020.

In this talk, I walked through the evolution of the Fessonia open source library API and how it was driven by the conceptual model of ffmpeg created early on in its development.

- Slides: https://bit.ly/fessonia-evolving-api
- Library: https://www.npmjs.com/package/@tedconf/fessonia

Modeling the Conceptual Structure of ffmpeg in JavaScript

Demuxed, San Francisco, CA, October 23, 2019.

Google Developer Group New Orleans Meetup, New Orleans, LA, October 5, 2019.

IIn this talk, I introduced a new open source library I built for Node.js to make interfacing with ffmpeg from JavaScript server-side code easier and lessen the learning curve, covering both conceptual structure and motivation, as well as practical examples.

- Video: https://bit.ly/fessonia-intro-demuxed
- Slides: http://bit.ly/fessonia-intro-slides
- Library: https://www.npmjs.com/package/@tedconf/fessonia

Sets, Bags, and Relational Theory: Real-World Interactions with Data

Loyola University New Orleans ΠΜΕ ΛΑΘ, New Orleans, LA, January 26, 2017.

I gave a talk on sets and their extension to relational theory of databases to the Pi Mu Epsilon mathematics honor society chapter at Loyola University New Orleans.

A Brief Introduction to Web Components and Polymer

#FrontEndParty Meetup #38, New Orleans, LA, Oct 27, 2016.

At this local New Orleans meetup on front-end web development, I gave give an introduction to web components and the new standards governing their implementation, as well as an introduction to Google's Polymer Project, which makes it possible to build web component based sites and apps today. Finally, I briefly covered the changes between Polymer 1.x and the 2.0 Preview, and the upgrade path provided by the Polymer team.

- Slides: https://github.com/nihonjinrxs/frontendparty-oct2016/raw/master/slides/webcomponents.pdf
- Code: https://github.com/nihonjinrxs/frontendparty-oct2016

Agile - Where is the Greatest Value

ACT-IAC Management of Change 2015, Washington, DC, Apr 15, 2015.

At this conference, organized by the American Council for Technology and Industry Advisory Council (ACT-IAC), I was one of three participants in a "Learning Lounge" panel discussion on agile project management methodologies and their fit and value for government technology projects.

JSON Processing in the Database using PostgreSQL 9.4

Data Wranglers DC Meetup, Data Community DC, Washington, DC, Jan 6, 2015.

I gave a talk on getting, processing, and reshaping JSON data for use in data analysis using PostgreSQL 9.4 at the Data Wranglers DC meetup group, a member meetup of the Data Community DC (http://datacommunitydc.org). The talk gave an introduction to JSON data, the JSON data types, operators and functions available in the newly released (December 18, 2014) PostgreSQL version 9.4, as well as two examples of pulling JSON data directly from public APIs into PostgreSQL and processing them in the database into analysis style flat tables.

- Slides: http://nihonjinrxs.github.io/dwdc-january2015/DWDC-January2015-RyanHarvey.pdf
- Code: https://github.com/nihonjinrxs/dwdc-january2015

Manipulating Data in Style with SQL

Polyglot Programming DC Meetup, Washington, DC, Oct 14, 2014.

I gave a talk on SQL to the Polyglot Programming DC meetup group. The talk gave an introduction to SQL and its use for relational databases, as well as some examples of using SQL on DataFrame data structures in R and Python.

- Slides: http://nihonjinrxs.github.io/polyglot-october2014/Polyglot-October2014-RyanHarvey.pdf
- Code: https://github.com/nihonjinrxs/polyglot-october2014

SQL, the Sequel

Data Wranglers DC Meetup, Data Community DC, Washington, DC, Aug 6, 2014.

I gave another talk on SQL and its utility for data preprocessing and analysis tasks to Data Wranglers DC meetup group, a member meetup of the Data Community DC (http://datacommunity.org). The talk covered topics such as custom views and functions in databases (with examples using PostgreSQL), performance tuning of queries using explain and indexes, basics of relational algebra, as well as use of SQL statements to manipulate dataframe objects in R and Python.

- Slides: http://nihonjinrxs.github.io/dwdc-august2014/DWDC-August2014-RyanHarvey.pdf
- Code: https://github.com/nihonjinrxs/dwdc-august2014

Data Wrangling in SQL and Other Tools

Data Wranglers DC Meetup, Data Community DC, Washington, DC, Jun 4, 2014.

I gave a talk on the basics SQL and its utility for data preprocessing and analysis tasks to the Data Wrangers DC meetup group, a member meetup of the Data Community DC (http://datacommunitydc.org). The talk covered an introduction to relational data, database tools, and the SQL standard, as well as the basics of SQL select statements, common table expressions and creating views from select statements. In addition, the use of relevant libraries in R and Python to connect to data in relational databases were explained using examples with PostgreSQL, IPython notebooks, and RMarkdown.

- Slides: https://nihonjinrxs.github.io/dwdc-june2014/DWDC-June2014-RyanHarvey.pdf
- Code: https://github.com/nihonjinrxs/dwdc-june2014

Creating an API using the OMB's Public Budget Database

Open Analytics Summit DC, Washington, DC, Mar 25, 2013.

At this summit, I gave a talk on some of the work I'd been doing on building a dataset on the OMB Public Budget Database as part my doctoral dissertation. In short, my message was "If you need an API on government data for something you're doing, build one!" I tried to provide tools and perspective on how that can be accomplished.

- Slides: http://datascientist.guru/oadc-budget-api-slides/