

## Mitchell Henke

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### Work Experience

#### **Innovation Specialist, General Service Administration - Login.gov (GS-15)**

Washington, D.C, United States

The mission of the General Services Administration is to help support the basic functioning of federal agencies by developing government-wide services and products to minimize cost. Login.gov is a program within GSA's Technology Transformation Services that aims to be the public's one account with the government so that people can have one account and password for secure, private access to participating government agencies.

07/2020 - Present

Full-time, 40 hours per week

Software and devops engineer helping securely scale Login.gov to over 40M accounts and dozens of partnerships with federal government offices and agencies.

- Keep abreast of latest technology, information and research by attending conferences like KubeCon and Code for America Summit, reading technical books like *Site Reliability Engineering*, and discussing with peers how to best apply these learnings to improve Login.gov and the Technology Transformation Services.
- Provide customer support, develop and maintain good working relationships with agency partners, including the Small Business Administration, Social Security Administration, and the Internal Revenue Service. Navigate and work through conflict with empathy, creativity, coalition building, situational awareness and tact to solve problems and manage stakeholder relationships. Some partnerships included weekly meetings to work through unique issues, and many are

supported through Slack, where I assist both technical and non-technical partners work through integrating with Login.gov.

- Support and help escalate issues from contact center agents in the Login.gov user support center by responding to inquiries in a timely manner.
- Assist the GSA Office of Inspector General (OIG) with investigations by providing relevant Login.gov data.
- Improve security by validating and patching vulnerability reports from the GSA Bug Bounty Program on HackerOne.
- Develop new features for Login.gov's Identity Provider service including asynchronous identity proofing, improving accessibility, and consistent code linting in the continuous integration pipeline.
- Improve the time to deploy new service updates by over 30%, reducing the number of person-hours needed to perform regular deployments and improving overall system reliability.
- Work to identify and address performance bottlenecks during regular web service load-testing scenarios to continue scaling Login.gov towards its goal of serving 100 million members of the public. One example includes improving response time by approximately 20%, delivering the same level of service more efficiently and reducing the overall cost of operation.
- Develop new features for Login.gov's Personal Identity Verification and Common Access Card (PIV/CAC) service including automating methods to download and validate intermediate certificate authorities to support a wider range of certificates across the Federal Public Key Infrastructure (FPKI) landscape.
- Reduced surface area of potential supply-chain attacks by identifying unused, unmaintained or otherwise replaceable software dependencies.
- Contribute to maintaining and improving Login.gov's security best practices like defense in depth, least privilege, zero trust, and ensuring we are secure by default.
- Identified unused features and/or code and removed them, resulting in a faster and more understandable application.
- Serve on project and exploratory task forces as a technical subject matter expert and provide both written and oral communication to represent Login.gov's perspective on issues.
- Share understanding, maintain code quality, provide feedback and receive feedback through reviewing pull requests, writing documentation, and pair programming with teammates.
- Monitor and apply the latest trends and strategies, including novel problem-solving canary deployment strategies to enable Login.gov to more

quickly and reliably deliver service improvements and updates. Technologies used include Terraform, Chef, and Amazon's Simple Storage Service.

- Develop incremental and iterative improvements for Login.gov's modern web applications, backend services, and cloud infrastructure. Technologies used include Ruby, Ruby on Rails, JavaScript, React, Amazon Web Services (AWS), relational SQL databases like AWS Relational Database Services (RDS) for Postgres/Postgresql, and NoSQL databases like AWS ElastiCache for Redis.
- Write new features using test-driven development to reduce defects, and iterate quickly by using automated testing, continuous integration, and continuous deployment on platforms like CircleCI, GitLab CI using tools like RSpec and Mocha.
- Collaborate and provide guidance on technical projects. Work with iterative and agile cross-functional or multidisciplinary teams on technical projects that include user experience designers, user interface designers, operations engineers and others using distributed version control systems (DVCS) like Git, GitHub, and GitLab.
- Delivered a number user-focused projects, tools, services and products as part of a team including automated code analysis, metrics and monitoring for critical external services, asynchronous workers, architecting dashboards to understand customer service metrics, improving continuous integration performance and significant performance improvements in web service response time using iterative and agile development methodologies.
- Provide technical project leadership and interface with high level stakeholders within the Login.gov program.
- Independently plan, develop and execute large scale programs to enable new ways of working and innovative approaches, including the execution of deployment artifact-building to reduce time to deploy, increase deploy reliability, and reduce deployment process friction.
- Adapt and tailor iterative methodologies to meet different delivery needs as circumstances and understanding changes, including Lean Development, Scrum, and Kanban. Applied a wide range of qualitative and quantitative methods to assess and improve project effectiveness and management processes, projects, and systems.
- Implement and ensure compliance with a variety of security standards including Kantara, National Institute of Standards and Technology (NIST), and Federal Information Processing Standards (FIPS).
- Work across multiple domains with exceptional breadth and intensity of effort, developing multiple complex features concurrently and shepherding them

through stringent compliance and security reviews with the support of others both within and outside Login.gov.

- Lead security and availability contingency planning exercises to improve the team's time to resolution during live production issues.
- Plan and lead efforts to address issues in areas where precedents do not exist. Conduct extensive investigation, analysis, and debugging of undefined factors to understand the nature and scope of problems and devise innovative solutions. I led work on prototyping application programming interfaces (APIs) with the United States Postal Service for in-person identity proofing, a new and complex area of product development for Login.gov.
- Onboard new teammates to increase the pace of improvement and scope of Login.gov's services.
- Anticipate potential threats and vulnerabilities and work quickly to patch and improve system security. This work included using tools like RuboCop, GitHub's Dependabot, Snyk, Bundler, Node Package Manager (NPM), Yarn and other static analysis tools.
- Provide expert technical advice on all software delivery related issues for Login.gov and support project objectives and priorities.
- Reinforce, uphold, and advocate for the Technology Transformation Services' core principles for building IT services, including building in the open, developing software using iterative processes, and using user-centered design methods.
- Identify and anticipate opportunities within Login.gov to improve service for our customers.
- Maintain software in GitHub and GitLab repositories for distributed source control, issue tracking, and release tagging. I am also in the rotation of writing the release notes that are managed through GitHub.
- Communicate and contribute towards project management using tools like Jira, Slack, GitHub issues, Google Documents, and other products in Google Workspace.
- Provide guidance in how to use user research findings to influence and implement in software product development.
- Serve as an expert software engineer and consultant by managing and directing highly complex and innovative projects and initiatives, including translating technical specifications into programming specifications.
- Develop, architect and customize, and acquire software programs.
- Be responsible for regularly testing, debugging, operating, and maintaining Login.gov's software programs and cloud infrastructure.
- Work in application on-call rotation to ensure Login.gov meets or exceeds its reliability obligations, and can respond quickly to incidents, threats, and outages.

- Support the development of changes in project direction based on the outcome of experiments and user-based and user-focused learning. Additionally, develop and define proper metrics to monitor and evaluate product success and impact.
- Maintain a work environment of respect, diversity, equity, inclusion, accessibility, mutual support, flexibility, collaboration, continuous learning, and commitment to our customers' and partners' needs by ensuring all perspectives are valued and included.

### **Senior Software Architect, RokkinCat**

Milwaukee, WI, United States

RokkinCat is a software engineering agency that builds tools like websites, mobile applications, embedded hardware, and machine learning products for businesses, their internal teams, and their customers. Some of these products were public facing.

05/2014 - 07/2020

Full-time, 40 hours per week

Lead engineer responsible for managing and developing software projects for clients as large as Fortune 500 companies to as small as two-person startup companies.

- Applied iterative Agile principles across dozens of projects and teams from early-stage startups to projects within Fortune 100 companies. I worked directly with our clients and their customers to understand their problems, help them develop goals to work towards, and communicate the implicit uncertainty of those goals and the path towards them. This planning included estimating and scoping technical and product requirements into milestones, tagged releases and issue tracking. Team sizes ranged from a few people to a few dozen people.
- Projects follow a Scrum process with daily standups, one or two week sprints, and meetings to plan, review, and improve future sprints. This user-centric process also consists of working with users, product owners, sales teams, data scientists, executives, designers, user experience experts, on cross-functional and multidisciplinary teams to continuously ship and refine the product being built.
- Work with and lead remote teams, and coordinate using communication tools like Slack, GitHub, Trello, and Basecamp. This often included on-site or remote pair programming. A few client projects are entirely open source.

- Manage infrastructure and deployment using services like Heroku, Render or Netlify, Amazon Web Services, and Digital Ocean.
- Developed web products using languages and frameworks primarily with Ruby, Ruby on Rails, Elixir, Phoenix, JavaScript, Cascading Style Sheets (CSS), Sass/SCSS, Hypertext Markup Language (HTML), and Postgres/PostGIS SQL, but also have worked on projects using Python, Redis, Memcached, Elasticsearch, Django, Flask, Node.js, React, Redux, Angular, Ionic, and Elm. These products are commonly for web or mobile applications served via RESTful APIs. Ruby web projects include a social media platform and a software service for restaurant promotions.
- Manage code using Git, GitHub and GitLab for source control.
- Automated testing of software projects with tools like ExUnit, RSpec, and Python's unittest for continuous testing and integration on platforms like CircleCI, Travis and GitHub Actions.
- Lead software development process by collaborating through peer review to ensure a maintainable and quality codebase.
- I've mentored multiple cohorts of 2-3 interns and junior developers in the entire software development and project process to help them improve their communication, understanding, and practice of software development.
- I work in and am familiar with a variety of domains, including development of web, native mobile, hybrid mobile, databases, backend, frontend, and embedded applications. Outside of direct implementations, I am also responsible for the overall architecture and design of the applications and systems. I have a strong background in building software for many types of customers that includes software tools built for software developers, applications for internal use within an organization, and consumer-facing applications.
- Manage public marketing and event production. The responsibilities range from procuring food and venues to emceeing and talking with attendees to make future events better. Events include Meetups, technical and soft-skill talks, and our quarterly hackathon series. The hackathon is structured around the participants, encouraging them to build and share whatever they like, and an emphasis on inclusiveness, learning from one another, and having fun.
- Improved organizational salary structure and transparency by directing definition of roles, responsibilities, and pay scales. This included developing tools for our custom internal administrative website, integrating with the company's bank and accounting providers, and documenting previously undocumented processes.

**Owner/Founder, Through the Wire**

Milwaukee, WI, United States

Through the Wire is an independent software consultant with a specialization in performant backend software systems

01/2014 - 05/2014

Full-time, 40 hours per week

Founded and ran all aspects of software consultancy specializing in Ruby web applications. Developed a web service used by hundreds of local restaurants and bars to share and advertise deals.

### **Software Engineer, Spreenkler Creative**

Milwaukee, WI, United States

Spreenkler was a creative agency focused on providing digital innovation using latest technologies for large and small businesses

08/2012 - 01/2014

Full-time, 40 hours per week

Software developer responsible for leading software team and bringing technical insight to many kinds of projects

- Led improvements in software development process through standardizing usage of version control, peer review, and automated testing.
- Worked with Kohl's to develop new in-store and digital experiences to increase customer engagement. One project included the use of Bluetooth beacons to recognize when people approached a display, and the display would show recommendations customized based on the individual. I also developed an application that customers could use to scan and process receipts as part of a rewards program.
- Provided updates and fixes to local community radio station 88.9's mobile application.
- Participate in multidisciplinary brainstorming sessions to come up with new proposals and offerings for our clients.

### **Software Developer, Quad/Graphics**

Sussex, WI, United States

International printing and logistics company with a mission of providing high-quality print and publishing services

06/2012 - 08/2012

Full-time, 40 hours per week

- Extended internal manufacturing and print applications for use in new international markets and plants

### **Software Development Intern, Quad/Graphics**

Sussex, WI, United States

06/2010 - 06/2012

Full-time, 40 hours per week during the summer

Part-time, 20 hours per week during the school year

- Led development of application to manage and customize server log rotation
- Converted legacy C++ desktop applications to modern C# frameworks as part of company standardization

### **Education**

#### **Milwaukee School of Engineering, Milwaukee, WI United States**

Bachelor of Science 05/2012

Major: Computer Engineering

Minor: Mathematics

Graduated with Honors

### **Open Source Projects**

- Maintainer of the most popular (7M+ downloads) Elixir error reporting service, Sentry.io's Elixir SDK (<https://github.com/getsentry/sentry-elixir/>)
- Maintainer of the Phoenix Publish-Subscribe Redis Adapter. This project allows for distributed Publish-Subscribe in environments where Erlang's inter-node connectivity is not possible.  
([https://github.com/phoenixframework/phoenix\\_pubsub\\_redis](https://github.com/phoenixframework/phoenix_pubsub_redis))
- Former maintainer of scoutapp.com's Elixir SDK  
([https://github.com/scoutapp/scout\\_apm\\_elixir](https://github.com/scoutapp/scout_apm_elixir))
- Former maintainer of Timber.io's Ruby, Rails, and Rack SDKs
  - <https://github.com/timberio/timber-ruby>



- <https://github.com/timberio/timber-ruby-rails>
  - <https://github.com/timberio/timber-ruby-rack>
- Published script using Shell, Ruby, and SQL to download public geospatial data to create geographical “crosswalk” for translating survey results between Milwaukee Zip Codes and Aldermanic Districts
  - [https://github.com/mitchellhenke/Milwaukee\\_ZipCode\\_Alder\\_Crosswalk](https://github.com/mitchellhenke/Milwaukee_ZipCode_Alder_Crosswalk)
- Implemented the algorithm described in Pańkowska & Błazik’s *Bolus Calculator with Nutrition Database Software, a New Concept of Prandial Insulin Programming for Pump Users* in Elm
  - <https://warsaw.netlify.com/>
  - <https://github.com/mitchellhenke/ElmWarsawInsulin>
- Published Elixir package to include Server-Timing headers in Phoenix and Plug applications through scoutapp.com integration ([https://github.com/scoutapp/elixir\\_plug\\_server\\_timing](https://github.com/scoutapp/elixir_plug_server_timing))
- Published Flask and React application to allow interaction with the two machine learning architectures I discussed in my *Deep Learning Recommender Systems* talk
  - <http://movies.mitchellhenke.com/>
  - [https://github.com/mitchellhenke/movie\\_recommender\\_server](https://github.com/mitchellhenke/movie_recommender_server)
  - [https://github.com/mitchellhenke/movie\\_recommender](https://github.com/mitchellhenke/movie_recommender)
- Published website containing my open source civic projects, including property assessment search, parking ticket search, and visualization of bus speeds throughout the day
  - <http://civics.mitchellhenke.com/properties>
  - <https://civics.mitchellhenke.com/transit>
  - [https://civics.mitchellhenke.com/parking\\_tickets](https://civics.mitchellhenke.com/parking_tickets)
  - <https://github.com/mitchellhenke/mprop>
- Built microsite to use device location to tell you which of Milwaukee’s 190 neighborhoods you’re in using public GIS data
  - <https://www.mitchellhenke.com/milwaukee-neighborhood-microsite/>
  - <https://github.com/mitchellhenke/milwaukee-neighborhood-microsite>
- Built Python-based Twitter bot to regularly post pictures of every lot in Milwaukee based on Neil Freeman’s open source implementation
  - <https://twitter.com/everylotmke>
  - <https://github.com/mitchellhenke/everylotbot>
- Built Adopt Your Drain Ruby on Rails application based on Code for San Francisco’s Adopt-a-Drain
  - <https://github.com/codeformilwaukee/adopt-a-drain>

- Published trigram search plugin for Ruby database library Sequel (<https://github.com/mitchellhenke/sequel-pg-trgm>)
- Published id-based pagination plugin for Ruby database library Sequel ([https://github.com/mitchellhenke/sequel\\_id\\_pagination](https://github.com/mitchellhenke/sequel_id_pagination))
- Published React application to view and filter City of Milwaukee property sales and tax assessments
  - [https://github.com/mitchellhenke/mprop\\_search](https://github.com/mitchellhenke/mprop_search)
- Contributed to Elixir package for building APIs compliant with the [JSON API spec](#) (<https://github.com/jeregrine/jsonapi>)
- Contributed to Milwaukee Police Dispatch Call Log that logs and maps information otherwise only published in list form for a rolling 90 minute period. I later analyzed this data in a blog post using R.
  - <http://mke-police.herokuapp.com/>
  - <https://github.com/nickgartmann/mke-dispatch>
- Published minimal link shortener built on Elixir and Plug ([https://github.com/mitchellhenke/ex\\_link\\_shortener](https://github.com/mitchellhenke/ex_link_shortener))
- Contributions and technical support for the 200 Nights of Freedom website commemorating the 50th anniversary of Milwaukee's Fair Housing Marches (built in Jekyll)
  - <http://200nightsoffreedom.org/>
  - <https://github.com/MarchonMilwaukee/MarchonMilwaukee.github.io>
- Participated in Phoenix Guides Sprint during ElixirConf 2017 and 2018
  - [https://github.com/phoenixframework/phoenix\\_guides/pulls?utf8=%E2%9C%93&q=is%3Apr+author%3Amitchellhenke](https://github.com/phoenixframework/phoenix_guides/pulls?utf8=%E2%9C%93&q=is%3Apr+author%3Amitchellhenke)
  - <http://phoenixframework.org/blog/contribution-sprint>
- Contributed support and fixes to the Code Corps API (<https://github.com/code-corps/code-corps-api>)
- Contributions to 18F website, Ruby database library Sequel, Ruby web framework Padrino, Elixir language core, Elixir job processing library Verk, Elixir web framework Phoenix, Elixir database interaction library Ecto, Erlang HTTP library hackney, Elixir ANSI console library Bunt, Elixir static code analysis tool Credo, Elixir HTTP layer library plug\_cowboy, Elixir test coverage tool excoveralls, Elixir function translation library ex2ms, Elixir Ansible playbook, Elixir Bugsnag SDK, rspotify Ruby wrapper for Spotify API, Elixir JSON library Poison, PostGIS, Elixir Redis library Redix, Elixir database library paginator, embedded hardware library nerves\_firmware\_ssh, embedded hardware library Adafruit\_CircuitPython\_CCS811, insulin pump software Loop, Go ORM gorm website, and Rust HTTP library hyper

## Public Speaking

- *Where can we improve public transit in Milwaukee?*, Safe & Healthy Streets Summit, 06/2021
- *Let's Make Buses More Efficient*, Code for Milwaukee Hack Night, 11/2019
  - This talk discussed how one can use public data to better understand bus service and efficiency
- *Let's Make Buses More Efficient*, Milwaukee Data Day, 08/2019
- *Random Forests: Robust and Interpretable Models*, Milwaukee Machine Learning Meetup, 11/2018
- *Deep Learning is for Everyone*, Big Data Wisconsin Conference, 08/2018
- *Getting Started with Machine Learning (For Businesses)*, 03/2018
- *Elixir Metaprogramming*, Milwaukee Functional Programming User Group, 02/2018
- *Making Predictions with Recurrent Neural Networks*, Milwaukee Machine Learning Meetup, 01/2018
- *Deep Learning Recommender Systems*, Milwaukee Machine Learning Meetup, 11/2017
- *Image Style Transfer with Deep Learning*, Milwaukee Machine Learning Meetup, 07/2017
  - In this talk I went over my reimplementation of two academic papers that found improved methods for combining the style of one image with the content of another using convolutional neural networks. The two papers were *A Neural Algorithm of Artistic Style* (Gatys et al., 2015) and *Perceptual Losses for Real-Time Style Transfer and Super-Resolution* (Johnson et al., 2016).
- *Improving Neural Net Newspaper Article Classification*, MKE Big Data, 07/2017
  - I discussed further work on my previous talk and used more traditional text processing features combined with neural networks to improve my model.
- *Learning to Use Keras to Analyze and Classify Newspaper Articles*, Milwaukee Machine Learning Meetup, 06/2017
  - To practice and share what I learned about neural networks, I built a machine learning model to classify a local news organization's articles by author using semantic word embeddings within a neural network.
- *Introduction to Elixir*, Milwaukee Code Camp, 10/2015

## Publications

- *Bus Arrival Times with Phoenix LiveView, Tracker and PubSub*, RokkinCat Blog, 03/2020
- *The Internet of Plant Things with Nerves and Elixir*, RokkinCat Blog, 09/2019
- *Deploying Multiple Machine Learning Models with Flask and Heroku*, RokkinCat Blog, 11/2017
- *Multi-Task Learning with fast.ai and PyTorch*, RokkinCat Blog, 07/2018
- *One Year of Sentry Elixir*, RokkinCat Blog, 10/2017
- *Text Classification with Deep Learning*, RokkinCat Blog, 06/2017
- *Replacing GenEvent with GenStage in Verk*, RokkinCat Blog, 02/2017
- *Reflecting on the Milwaukee Slack*, RokkinCat Blog, 01/2017
- *Market Basket Analysis*, RokkinCat Blog, 01/2017
- *Exploring Milwaukee Police Call Log Data*, RokkinCat Blog, 12/2016
- *Having Some Fun with Postgres 9.6*, RokkinCat Blog, 10/2016
- *Generating Fake Data for Postgres in an Elixir Script*, RokkinCat Blog, 10/2016
- *Postgres Location Searching in Ecto*, RokkinCat Blog, 09/2016
- *Using the fuse Erlang Library to Implement the Circuit Breaker Pattern in Elixir*, RokkinCat Blog, 09/2015
- *Extending Phoenix Chat App with ETS-based Logs*, RokkinCat Blog, 07/2015
- *Postgres Full Text Search in Ecto*, RokkinCat Blog, 05/2015

## **Volunteer and Service Roles**

### **Co-Founder and Delivery Lead**, Code for Milwaukee, 04/2019 - 03/2020

- Formed and helped run the local Code for America brigade in Milwaukee as a member of the Code for Milwaukee core team focused on building community resources by engaging residents in relationship-building and technical problem-solving.
- Work with Sweet Water (Southeastern Wisconsin Watershed Trust) to build a website to support their Adopt Your Drain program
- Develop and maintain website, including the upgrade from United States Web Design System v1 to v2

### **Member**, Milwaukee County Transit System Transit Services Advisory Committee, 06/2018 - 03/2020

- Collect and provide feedback to MCTS and Milwaukee Transit Services on transportation issues as a rider and community member

### **Adviser**, Milwaukee School of Engineering Computer Science Industry Advisory Committee, 10/2018 - 10/2020

- Advise committee of professors, faculty, students, and industry professionals on improving MSOE computer science curriculums and student experience

**Organizer**, MKE Python, 04/2018 - 03/2019

- Host events and organize speakers, venues and sponsorships

**Founder/Organizer**, Milwaukee Machine Learning Meetup, 06/2017 - 10/2019

- Create local meetup centered around learning and applying machine learning
- Grew to 500+ members

**Teaching Assistant**, Technology Education and Literacy in Schools, 08/2017 - 05/2019

- Teach high school students computer science and programming in Snap! and Python
- Work with school administrators, classroom teachers, and local industry professionals to develop a sustainable computer science program at Tenor High School in Milwaukee

**Adviser**, Milwaukee School of Engineering Software Engineering Industry Advisory Committee, 10/2016 - 05/2018

**Co-Organizer**, Milwaukee Functional Programming User Group, 11/2015 - 03/2019

- Host and organize functional programming speakers and workshops