

## Thomas Barron, Resume

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### LINKS

- Personal website: <https://tbarron.xyz/>
- Github: <https://github.com/tbarron-xyz>

### EMPLOYMENT

**Galehead Development** (remote – Boston, MA), Software Engineering Consulting, October 2018 – present.

- A solar project development business finds itself increasingly reliant on software tools and decides to seek professional guidance from someone with experience in at-scale production systems.
- General consulting and contracting: advising on topics of optimization and organization when the business has questions, and working directly in the code base for items that they agree they'd like to see. Implementing and managing the Gitflow branching model. Improving general project structure/organization, implementing Typescript+React.
- OpenLayers frontend with Flask/PostGIS/Geoserver backend.

**Churchill Navigation** (Boulder, CO), Software Engineer, January 2018 – September 2018.

- My role: Sole developer for <http://churchillnavigation.com/earthscape/>, a video hosting/management service that synchronizes timestamped metadata playback side-by-side with video playback.
- Most work focused on integrating HLS livestreaming, over a cellular network, into the existing video/data extraction/delivery pipeline. Hardening several components to ensure reliable behavior even in the case of moderate packet loss. SRT as transport protocol.
- Duties involve new feature development, old code maintenance/bug fixes, code deployment, AWS infrastructure management. Also involved customer interaction, physical installation of equipment onto helicopters, and nearly complete self-direction (no-management company structure).
- React frontend with grunt/browserify toolchain. Python + Flask backend with Celery workers (RabbitMQ broker) for handling compute-intensive tasks. Some Golang microservices.
- All-AWS infrastructure (EC2 Ubuntu, RDS PostgreSQL, S3, Elastic Transcoder, IAM, ElastiCache Redis) with Ansible for deployment management.

**CoreLogic** (Oxford, MS), Software Engineer, August 2016 – December 2017.

- Role: fullstack web and backend services developer.
- Working closely with business stakeholders to understand design requirements and plan effective solutions to business needs.
- Writing new responsive SPA frontends in TypeScript with Angular 2+. Making improvements to existing frontends written using Knockout.js, Angular 1, and plain Javascript. HTML5/CSS/JS. Extensive gulp/webpack tooling for compiling and bundling.
- Writing performant backend applications in C# on .NET Core or .NET Framework using ASP.Net (WebAPI). Incoming data to our REST and RPC API endpoints are processed and stored. Outgoing data is supplied to our external clients and partners, including large banks and the IRS. High-throughput systems use RabbitMQ as a work queue. Data is supplied via APIs to our various frontend clients, both desktop and mobile.
- Automating testing, builds, and deployments using Microsoft TFS.
- Supporting fellow developers when I have some knowledge that could be shared. Being available for pairing and debugging sessions. Holding my team's work to a

high standard through code reviews.

SAMPLE PERSONAL — Twitch chat analytics

PROJECTS

- Running on an AWS EC2 instance (headless Ubuntu)
- **Chat monitor (Golang)**  
<https://github.com/tbarron-xyz/twitch-chat-monitor>: Grabs the top 25 live streams from the [twitch.tv](https://www.twitch.tv/) API, listens to the chat feeds for those streams, performs some basic analytics, caches state in Redis, and backs up to DynamoDB for time series data storage.
- **Web server (Node.js)**  
<https://github.com/tbarron-xyz/tbarron.xyz-express-server>: WebSockets push fresh data to all active frontend clients once per second. Queries DynamoDB to retrieve time series data when requested via API.
- **Client-side (React + TypeScript via SystemJS)**  
<https://github.com/tbarron-xyz/tbarron.xyz-react-frontend>: uses WebSockets to receive fresh data pushed from the server once per second & display it. Graphs the last 24 hours of time series data (obtained via API).
- ~10 GB of chat traffic analyzed per day

EDUCATION

**University of Kentucky**

- B.S., Mathematics (May 2016)
- Minor in Physics

PUBLICATIONS

- T. Barron, C. O'Neill, R. Pelayo. *On the set of elasticities in numerical monoids*. [arXiv:1409.3425](https://arxiv.org/abs/1409.3425). *Semigroup Forum*. 2015.
- T. Barron, C. O'Neill, R. Pelayo. *On dynamic algorithms for factorization invariants in numerical monoids*. [arXiv:1507.07435](https://arxiv.org/abs/1507.07435). *Mathematics of Computation*. 2016.
- Two algorithms from the above are included in the package `NumericalSgps` for `GAP`, a popular computational discrete algebra software.