

CAITLIN C. O'CALLAGHAN

San Francisco, CA • (847) 848-5672 • caitlinocallaghan22@gmail.com • <https://caitlinocallaghan.com/>
American, Canadian, Irish citizenships

TECHNICAL SKILLS

- Knowledge of C++, Python, Java, JavaScript, AWS, FFMPEG, SRT, DASH, HLS, VMAF, and React.js,
- Experience in Video Systems Engineering, Application Development, Biomedical Research, and Computational Biology

WORK EXPERIENCE

- Facebook Inc., Software Engineering Intern** | *Menlo Park, California* **May '21 – Aug '21**
- Wrote *Low Latency DASH (LL-DASH)* support in C++ for Shaka Packager, Google's open source media packaging tool, and had the LL-DASH feature accepted to Shaka Packager's main repository
 - Built an end-to-end pipeline to demonstrate *LL-DASH* support on *aarch64* and *x86 (FFMPEG, Shaka Packager, AWS, Dash.js)*
 - Implemented and productionized Shaka Packager, using *LL-DASH* and *DRM*, within a Facebook Reality Lab product
- StreamShark, Software Engineering Intern** | *Melbourne, Australia* **Jan '21 – Apr '21**
- Architected and implemented an *end-to-end video streaming pipeline* supporting *live* and *video-on-demand streaming* using only open-sourced software, eliminating paid services and reducing company costs
 - Calculated server-side *VMAF* scores for different encoding configurations (*Java*) and displayed the *VMAF* scores on the client-side user interface (*React.js*)
- Facebook Inc., Software Engineering Intern** | *Menlo Park, California* **May '20 – Aug '20**
- Created and patented a *reactive bitrate video system* using C++, *SRT*, and *network communication* to maintain optimal video quality and prevent rebuffering by analyzing available bandwidth and adjusting the encoder's bitrate in real-time
- Airtime Media Inc., Software Engineering Intern** | *Palo Alto, California* **Sept '19 – Dec '19**
- Designed a *VMAF* library to objectively quantify the quality of live video distributed over a *real-time delivery* network for the Airtime social media app
 - Used C++, *CMake*, and *process synchronization* to implement the library and integrate it into Airtime's video chat test app
- TribalScale, Agile Software Engineering Intern** | *Toronto, Ontario* **Jan '19 – Apr '19**
- Constructed a full-stack, company-wide site for project management and resource allocation implementing *Kotlin*, *Spring Boot*, and *GraphQL* in the backend and utilizing *React.js*, *Redux*, and *CSS* in the frontend
- Pathway Commons, Full-Stack Software Development Intern** | *Toronto, Ontario* **May '18 – Aug '18**
- Developed a bioinformatic web application for enrichment analysis, using *JavaScript*, *React.js*, and *Node.js* to display a dynamic network of pathways related to a user's entered set of genes

PROJECTS

- Streamline** **Aug '20 – Present**
- Built an 8k video encoder and live streaming platform using open-sourced software and off-the-shelf hardware
 - Presented work at the Demuxed 2020 video engineering conference
- Adaptive VR for Therapeutic Use** **Sept '20 – Present**
- Capstone design project developing a VR control mechanism for tetraplegics who have limited hand motor control

EDUCATION

- University of Waterloo, Honors Biomedical Engineering Program, Software Engineering Minor** **Sept '17 – Present**
- Cumulative GPA: 3.92
 - Engineering Dean's Honors List (top 5% in program)
 - Expected Graduation: April 2022
- Illinois Mathematics and Science Academy (IMSA)** **Aug '14 – Jun '17**
- Chicago Daily Herald All Area Academic Team and Illinois State Scholar

PUBLICATIONS

- **Objective Video Quality Analysis at Airtime.** *Airtime Blog*. Dec. 2019. Available: <https://blog.airtime.com/>.
- **Pathway Commons 2019 Update: integration, analysis and exploration of pathway data.** *Nucleic Acids Research*. Oct. 2019.
- **Combined targeting of Estrogen Receptor alpha and XPO1 prevent Akt activation, remodel metabolic pathways and induce autophagy to overcome tamoxifen resistance.** *Cancers*. vol. 11, no. 4, pp. 479-1 – 470-20, Apr. 2019.
- **Role of T-Tubule Remodeling on Mechanisms of Abnormal Calcium Release During Heart Failure Development in Canine Ventricle.** *American Journal of Physiology: Heart and Circulatory Physiology*. vol. 13, no. 6, May. 2020.

PERSONAL

- Mandarin 中文** Intermediate level proficiency with ability to read, hand-write, and type
- Soccer** Intramural at University of Waterloo (2019 Champions), Team Captain, Team MVP & All-Conference in High School