Lab. 2 – Almășanu Teodor-Ioan

1. What did the others, techniques and methodologies used, evaluation methods, results

A subsidiary of Amazon, Twitch as most people know is a live streaming platform (desktop and mobile, iOS and Android) processing around 10 million active users on a daily basis. It was introduced in June 2011 as a spin-off of the general-interest streaming platform Justin.tv.

Twitch primarily focuses on video game live streaming, including broadcasts of esports competitions, in addition to music broadcasts, creative content, and more recently, "in real life" streams. Content on the site can be viewed either live or via video on demand. Originally designed for the gaming community allowing them to broadcast their plays which can be followed and watched by fellow gamers or just people signed on the Platforms interested in watching other people playing video games.

The mere fact that it gets more than 2 million streamers monthly means there is huge potential in esports live broadcasting.

Right after signing up on Twitch, you can start watching gaming tournaments, editorials and game events by video game publishers.

Among other things, Twitch has:

* One of the largest live video distribution systems in the world
* A real-time chat system
* Web services that provide access to functionality and data
* Data storage systems
* Client applications on the web, and on a multitude of platforms — mobile and console in particular
* Data science infrastructure
* Internal tooling and systems — configuration management, deployment systems, hardware and software provisioning, testing and QA
* Network infrastructure that keeps the bits between all of these systems and the end users flowing

On this research paper we will focus on the video system of Twitch, this system is responsible for getting video from the broadcaster to the viewers. This includes the following core components:

* Video ingest — The system takes RTMP video in, and then transports it to the transcode system (RTMP is a TCP-based protocol which maintains persistent connections and allows low-latency communication. To deliver streams smoothly and transmit as much information as possible, it splits streams into fragments, and their size is negotiated dynamically between the client and server).
* Transcode system — The incoming RTMP stream from the broadcaster, is transcoded into multiple HLS streams (also known as HTTP Live Streaming). This is implemented via a combination of C/C++, and Go.
* VOD (Video on Demand) — They take all of incoming video systems and archive them for the VOD system.

2. Important names in the field, research teams;

* Alex Lamb - University of Montreal, MILA
* Alex researches new algorithms for deep learning aimed at improving their generalization and modularity. Outcomes from this work could aid performance on tasks with high diversity and rapid change.
* Zhengyuan Yang - University of Rochester
* Zhengyuan’s research interests include vision + language (e.g. visual grounding, tracking by language) and human-centered image understanding (e.g. human action recognition, human part parsing).
* Zhengyuan’s research could have many applications at Twitch, such as language-based video search, chat content understanding, and human-centered video editing.
* Sneha Mehta - Virginia Tech
* Sneha’s research involves information extraction and sentiment analysis from text streams using natural language processing and machine learning.

3. Related Articles and books;

* “The Technology of Video and Audio Streaming” by David Austerberry, 2013
* “Mastering Internet Video: A Guide to Streaming and On-Demand Video: A Guide to Streaming and On-Demand Video” by Damien Stolarz, 2005
* “Twitch Engineering: An Introduction and Overview” by Douglas Soo, 2016

4. Relevant links;

* <https://medium.com/twitch-engineering/twitch-engineering-an-introduction-and-overview-36ceeb8875de#.unpfgyzen>
* <https://dev.twitch.tv/docs>
* <https://www.twitch.tv/>
* <https://blog.twitch.tv/en/2020/01/15/introducing-our-2020-twitch-research-fellows/>

5. Resources and tools available.

* Twitch.js - A wrapper for the Twitch APIs to make using them easier while using JavaScript
* Twitch Token Generator - A simple tool to generate access tokens for Twitch with custom scopes. Good tool for testing various Twitch third party tools
* twitch4j - An API wrapper for using the Twitch APIs in your Java projects
* SwiftTwitch - A Swift wrapper for the Twitch API aiming to provide easy access by returning typed data values to help you finish your application without headaches