

Tommy Chow



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About me

Hello, I'm Tommy!

- Software engineer (frontend/web/mobile) currently based in NYC
- Attended University at Buffalo for CS, graduated in 2022
- Worked at Wildr (early-stage social media startup) in 2023
- Enjoys PC gaming, building mechanical keyboards, and loves dogs



The Twitch ecosystem

Twitch is a social live-streaming platform





i→ STREAM CHAT 푸 ႙t 11:50 1111 KoZa... 11:40 1111 HerrErlau...



🕦 📢 tuhdor: GLAZE ALL OVER HIM MUGA

Chow_peepoHappy: baseg

White his weshes the high stress of the high stress

Replying to @FURI: i would feed him to my birds theresnobodyhere: D:

Inktr.ee/ohnePixel

😫 justachi: ahahhahahahhah

Replying to @FURI: I would feed him to my birds
 iggiexd: GIGACHAD

Nugget_420_: xdd

🥪 🚺 FiftyShadesOfPotatoDarker: D:

🧭 🚉 vilkku_1234: D:

mr_broken_man: 8 hour steam ftw lets gooooo

껕 domii34522323: XDD

slowcamry: DID THE MATCH END?

hotgluee: unglaze D:

2 3 AtomiX_CS: Alarm KQLY smoked him xdd https://www.hltv.org/stats/matches/mapstatsid/ 17483/nostalgie-vs-penta Alarm

2 ToopakParkour: ??

🧭 🚼 xkroniiik: xdd

🖄 justachi: xdd

0



Al_Jawn: true true

🔁 drjamali: xdd

Siustacil, Chat paused due to scroll

Send a message

 \odot

O Chat

A core feature of Twitch is the live chat



Replying to @FURI: I would feed him to my birds
 theresnobodyhere:

Fossabot: All my socials: linktr.ee/ohnePixel

😫 justachi: ahahhahahahhah

Replying to @FURI: i would feed him to my birds
 iggiexd:

Nugget_420_:

S FiftyShadesOfPotatoDarker:

👩 🔄 vilkku_1234: 🍘 mr_broken_man: 8 hour 🌍 ftw lets gooooo

🔁 domii34522323: XDD

slowcamry: DID THE MATCH END?

hotgluee: unglaze
 KQLY smoked him

https://www.httv.org/stats/matches/mapstatsid/ 17483/nostalgie-vs-penta

ToopakParkour: ??

🧭 🔯 xkroniiik: 🎼



🤣 🎁 juic3_9999: 🎆

🍓 156.2K 🖻

Al_Jawn: true true

Urjan Urjan Chat paused due to scroll

∲ ⊙

Send a message

Enhanced by community third-party extensions

3 major web extensions with 7 million active users



2 problems with the Twitch mobile app

No extensions on mobile, so no third-party emotes



The channel interface is cluttered and bloated



What is Frosty?

Frosty is a fully-featured mobile client for Twitch



It brings quality-of-life features and third-party emote support

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Nauryl	ol: 🖕						
GB_Sza	abi:	0					
TYZOk	ite: Jim c	arrying th	e restaura	ant			
23	Perseus	WP: she d	lidnt paid				
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Chann	nel Gl	obal					
Chanr	nel Gl	lobal	2	1		夏	
	_						A CONTRACTOR
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			624	Ţ	Ő		

All while maintaining the core features of Twitch



It's also completely free and open-source

tommyxchow / frosty Public				♡ Sponsor ♀ Notifications ♀ Fork 30 ☆ Star 506
Code 🔿 Issues 59 🏦 Pull re	equests 1 🕑 Actions 🖽 Projects 3 🔅 Sect	urity 🔟 Insights		
	🐉 main 🔸 🐉 4 Branches 🛇 33 Tags		<> Code +	About
	🐨 tommyxchow Release v4.3.0 🗸		it month 🕥 1,004 Commits	A mobile Twitch client for iOS and Android with 7TV, BetterTTV (BTTV), and
	🖿 .github			FrankerFaceZ (FFZ) support.
	android			P frostyapp.io android dart chat ios firebase
	assets			
	ios			frontend mobx fastlane vscode actions flutter chat-application
	🖿 lib			
	🖿 test			
	🗅 .gitignore			Readme AGPL-3.0 license
	🗅 .metadata			
				☆ 506 stars ⊙ 6 watching
	README.md			
	analysis_options.yaml			
	D pubspec.lock			Releases 31
	Dubspec.yaml			♥ v4.3.0 (Latest) list month
	다 README - 한 AGPL-3.0 license			

Browse followed streams

8:53		
Following		2
3:26:14	Doublelift Athis stream is not League of Legends 6,351 viewers	for the faint of h
3:33:34	e aceu something pal Palworld 3,655 viewers	1
0:20:21	pokelawls bogg dann Grand Theft Auto V 1,956 viewers	
11:23:15	DashDucks Come relax with us. Animals, Aquariums 254 viewers	
Following	↑ Тор	Q Search

Browse by top categories

8:53		🗢 🗖	١
Тор		2	l
Streams	Categories		
Just Challing	Just Chatting		,
grand there- auto.	Grand Theft Auto V		
Palworth	Palworld		
FORTNITE	Fortnite		
LEAGUE? LEGENDS	League of Legends		
- 			
\heartsuit	\uparrow	Q	ļ
Following	Тор	Search	

Search for channels and categories



Watch live streams with chat



See every third-party emote



Better chatting with autocomplete



19

Lots



of



customizability

8:55			(? 🔲
<	Chat		
Message spacing	J		10p
Font size			1
Message appear	ance		
Use readable nar Adjusts the lightnes dark names.		brigh	nt and
Show deleted me Restores the origina messages.		eted	
Show message d	ividers		
Message timesta	mps		
✓ Disabled	12-hour		24-hour
Delay			
Message delay			C
Adds a delay (in sec in chat. 15 seconds			
Alerts			

20

Available on Android too



Developing Frosty

Starting out with SwiftUl

- Relatively new and trendy, native performance and features
- Easy to prototype, uses a standardized MVVM pattern
- Had a honeymoon phase, but then problems began to show







Problems with SwiftUl

- Layouts views were not complex enough, no flexbox or HTML-like inline span
- Duplicate GIF emotes aren't synced
- Lack of documentation



Exploring other frameworks

React Native (Expo)

- Layouts are better (flex and inline span)
- Duplicate GIFs are **not** synced
- Early inconsistencies between iOS and Android due to different native views

Flutter

- TextSpan and WidgetSpan widgets
- Duplicate GIFs are synced
- Uses a custom rendering engine (Skia/Impeller) so visuals are identical across platforms





Working with Flutter

Pros

- Easy to pick up, very similar to React and JavaScript/TypeScript
- Official and community documentation
- Large standard widget library with good defaults and styles



Cons

- Earlier Skia engine caused noticeable jank (fixed recently with Impeller)
- Uncanny valley with "fake" views
- Nesting can get pretty messy



Frosty architecture overview

Models/Types					
-					
Common Globals					
Theme styles	Constants	Util function	IS C	Widgets	
API Service Providers					
BTTV API	FFZ API	7TV API		Twitch API	
Ann Commiss Descritions					
App Service Providers		(
Auth Store	Auth Store Settings Store				
(
Арр					
Screen	Screen		Screen		
Feature/Subfeature	Feature/S	ubfeature	Featur	e/Subfeature	
ViewModel (Store)	ViewModel	(Store)	ViewMo	del (Store)	
Shared Widgets	Shared 1	Widgets	Share	ed Widgets	

Separation of concerns with MVVM pattern

	MVVM Pattern	
Model	View	ViewModel
<pre>class User { const name const dateCreated } class ChatMessage { const author: User const message }</pre>		<pre>var chatMessages = [] function connectToChat() { } function sendMessage() { } function refresh() { }</pre>









🖥 lib
📑 apis
ia models
in screens
💼 widgets
💊 alert_message.dart
🕥 app_bar.dart
💊 block_report_modal.dart
🕥 cached_image.dart
🕥 dialog.dart
💊 loading_indicator.dart
💿 notification.dart
🕥 page_view.dart
🕥 profile_picture.dart
💊 scroll_to_top_button.dart
💊 section_header.dart
🕥 uptime.dart
🕥 constants.dart
🕥 firebase_options.dart
🕥 main.dart
🕥 theme.dart
🕥 utils.dart



class AlertMessage extends StatelessWidget { final String message; final Color? color; final bool centered const AlertMessage({ super key, required this message this centered = true, this color Goverride Widget build(BuildContext context) { return Row(mainAxisAlignment: centered ? MainAxisAlignment center : MainAxisAlignment start, children: [----Icon(Icons.info_outline_rounded color: color ?? Colors.grey -const SizedBox(width: 8) -Flexible(-child: Text(message, style: TextStyle(fontWeight: FontWeight w500, color: color ?? Colors.grey,







++/// Returns a [CategoriesTwitch] object containing the category info corresponding to the provided [gameId].
<pre>Future<categoriestwitch> getCategory({</categoriestwitch></pre>
required Map <string, string=""> headers,</string,>
required String gameId,
+) async {
<pre>final url = Uri_parse('https://api.twitch.tv/helix/games?id=\$gameId');</pre>
final response = await _client.get(url, headers: headers);
<pre>final decoded = jsonDecode(response.body);</pre>
if (response statusCode = 200) {
return CategoriesTwitch.fromJson(decoded):
} else {
return Future error('Failed to get category: \${decoded['message']}');



/// Logs in the user with the provided [token] and updates fields accordingly upon successful login. @action
Future <void> login({required String token}) async {</void>
<pre>_tokenIsValid = await twitchApi.validateToken(token: token); if (!_tokenIsValid) return;</pre>
<pre>// Replace the current default token with the new custom token. token = token;</pre>
await _storage.write(key: _userTokenKey, value: token);
await user init(headers: headersTwitch);
// Set the login status to logged in. if (user.details ≠ null) _isloggedIn = true;
- Cost variation - The cost of
<pre>debugPrint('Login failed due to \$e');</pre>
Paction
Future <void> logout() async {</void>
try {
// Delete the existing user token.
await _storage.delete(key: _userTokenKey); token = null;
v ober use ();
_token = await _storage.read(key: _defaultTokenKey);
<pre>// If the default token does not already exist or it's invalid, get the new default token and store it. if (_token = null !await twitchApi.validateToken(token: _token!)) {</pre>
_isLoggedIn = false;
<pre>debugPrint('Successfully logged out'); } catch (e) { debugPrint(e.toString()); }</pre>






Challenges

Recreating the Twitch chat

- Many intricacies with websockets and Internet Relay Chat (IRC) spec
- Making chat performant and able to withstand thousands of messages
- Lazy and batched rendering methods

@badge-info=;badges=premium/1;client-nonce=1a949a3826461765fbe c17b9a414f0c4;color=#19B3A8;display-name=Test;emotes=;first-ms g=0;flags=;id=f1050ef3-0d89-472a-a572-e3bfef81771e;mod=0;retur ning-chatter=0;room-id=94753024;subscriber=0;tmi-sent-ts=17058 80990173;turbo=0;user-id=12345678;user-type= :test!test@test.tmi.twitch.tv PRIVMSG #xqc :this is test EMOTE message EMOTE hello EMOTE EMOTE



Implementing the video stream player

- Twitch doesn't provide raw stream URLs (.m3u8) in their public API
- Workaround was to use a web view with the web player embedded
- Custom Flutter overlay with JavaScript to control the web player

7:52			
Animats, Aquartur	s, and Zoos	7:53 PashDucks Come relax with us, - <3 liokens Come relax with us, - <3 liokens Come relax with us, - <3 liokens Paying Animals. Aquarlums, and Zoos for 3 Very come of the second sec	1 1 5 ⁴⁴
Connecting to chat Connected to DashDucks's chatt	a Nomsi 🏠	Connecting to chat Connected to DashDucks's chat!	
		Log in to chat	9

CI/CD with GitHub Actions and Fastlane

- Building and uploading to both stores for every release was tedious
- Made a deploy script that automates everything on a version tag push
- Took ~3 days to figure out but saved countless hours

Latest deployments from all environments 36 deployments Release v4.3.0 Latest Release v4.3.0 Deployed to release-los by m tommyxchow via Build and release Frosty #29 Release v4.3.0 Deployed to release-android by monotone to many who wis Build and release Frosty #29 Release v4 3 0 Deployed to release-android by 77 tommyxchow via Draft GitHub release #28 Release v4.3.0 Failed to deploy to release-los by 🐨 tommyxchow via Build and release Frosty #29 Release v4.2.1 Deployed to release-android by 7 tommyxchow via Build and release Frosty #28 Release v4 2 1 Deployed to release-android by 77 tommyschow via Draft GitHub release #27 Release v4.2.1 Shorten Android release notes Shorten Android release notes Deployed to release-jos by 🐨 tommyschow via Build and release Frosty #27 Release v4.2.0 Release v4.2.0 Deployed to release-android by 😨 tommyxchow via Draft GitHub release #26 🔞 Release v4.2.0 Release v4.1.0 Deployed to release-ios by 😨 tommyxchow via Build and release Frosty #25

frosty / .github / workflows /	Add file 👻 ···
🈨 tommyxchow Revert "Delete LC_ALL and LANG from action" 🚥 🗸	2a5a23e - 2 months ago 🕚 History
1	
C ciyml	
🗅 gh-release.yml	
D pr-checkyml	
🗅 store-release.yml	

Project management

- A variety of tasks but not sure where to start
- Used GitHub Projects and Kanban to get an organized overview
- Helps prioritize stories and tasks



⊕ Frosty: Todo				
Table Kanban + New view				
✓ ○ Done 52				
1 Improve chat performance/reduce chat battery usage #14				
2 Redesign and reorganize settings screen #92	Tommyxchow			
3 O Upgrade to Flutter 3 #113	Tommyxchow			
4 O Add emote menu search bar/autocomplete #61	😿 tammyxchaw			
5 O Use emote sizes provided by the FFZ/7TV API for more accurate sizing #95	Tommyxchow			
6 O Redesign streams list and stream cards #91	Tommyxchow			
7 O FAQ link #99	tommyxchow			
8 Reset all settings button #98	Tommyxchow			
9 Implement ability to stop playback after a certain period of time #84	Tommyxchow			
10 O Add sleep timer button to overlay #83	😨 tommyxchow			
11 O Add error handling for channel list to notify user when a request failed #34			task	
12 O Add emote size slider (with preview) #66	🐨 tommyxchow		task	
13 O Add ability to clear cache #33			task	
14 O Add chat message spacing slider #67	😨 tommyxchow		task	
15 O Add font size slider (with preview) #65	Tommyxchow			
16 O Implement exponential backoff #63	🐨 tommyxchow			
17 O Add error handling for chat stream to notify user when the connection fails #36			task	
18 O Add error handling for assets requests to notify user when a request failed #35			task	
19 O Implement search by category #43				
20 O Build categories section screen #42	Tommyxchow			
21 O Add API requests for top games and search categories #41	Tommyxchow			
22 O Add API requests for user blocking and unblocking #52	Tommyxchow			
23 O Add ability to block and unblock users in chat #54				

🗄 3 Open 🗄 0 Closed		Sort +
Frosty: Bugs #5 updated on Nov 1, 2023	Broken stuff that is known about.	
Frosty: Todo #6 updated on Oct 22, 2023	Miscellaneous tasks that are currently being worked on.	
Frosty: Planned Features Tupdated on Dec 27, 2022	Features that are planned and will be implemented soon™.	

Release and marketing

Releasing on the app stores

- iOS TestFlight to ~100 Reddit users
- Play Store was easy, but App Store was surprisingly tedious
- Eventually published on Feb. 2022

DS App 😗 4.3.0 Ready for Sale	iOS App Version 4.3.0	Save
dd Platform	The product page for this app version will be published on the App Store with the assets and metadata below. English [U.S) 2
	endlage (end	
neral		
Information	iOS Previews and Screenshots	
and Availability vacy	Adding screenshots for the newest devices can help you accurately represent your app's user experience on the App Store. Keep in mind that we'll use these screenshots for all ic sizes and localizations. Screenshots are only required for IOS apps.	IS devi
nd Reviews istory	IPhone IPad View All Sizes in Media	Manaç
ry	IPhone IPhone IPhone	
	Phone 6.7° Display (Required)	
	(kequirea)	
nases s		
	The second	
notions ct Pages		
ct Pages		
ptimization		
timization		
	Promotional Text. ② Edit Watch and chat on Twitch with your favorite emotes from 7TV, BTTV, and FF21	
	watch and that on twitch with your layout endles from 719, 0119, and 1121	
	Description ?	
	The better mobile Twitch chat experience.	
	Frosty brings quality-of-life features and, most importantly, third-party emotes from 7TV, Better/TTV (BTTV), and FrankerFaceZ (FFZ) — popular extensions for Twitch used by	
	millions.	
	What's New in This Version ?	
	New Features	
	 Added the ability to tap on user mentions in chat (by @Artiu on GitHub) Added stream latency details to the custom overlay in landscape mode (by @Artiu on GitHub) 	
	Improvements	
	inga Orennena	

Marketing website built with Next.js



frostyapp.io \land Frosty ¥ 0 Made for hew users Twitch regulars Developers Log in with your Twitch account to utilize Features . Browse followed streams -

Watch streams with chat Customizable settings And much more...

Autocomplete emotes and user mentions



"Guerilla" marketing on Reddit and Discord



Post-release

Post-release

- Maintaining the app with updates
- Addressing user feedback and feature requests
- Debugging bugs and crashes, API deprecations and more
- Contributor PR reviews

Open - 149 Closed				
O Frosty app icon #318 by x8136 was closed on Dec 21, 2023				
O i am subbed to a channel but i still get ads. I am not sure why beg #311 by tamusandesh99 was closed on Dec 22, 2023				
O Missing username in chat app v4.2.0 May 4308 by sun-wise-man was closed on Nov 30, 2023			8	
O App crashes on iOS 12 bug #303 by Jo7117 was closed on Dec 22, 2023				
O Multiple text lines clip chat box edges bug #296 by dezpenia was closed on Nov 21, 2023			8	
O Windows Client feature request #293 by Schlafarzug was closed on Nov 10, 2023				
O 7tv emotes that should overlap do not on clientside bug #290 by kenbeck13 was closed on Nov 1, 2023			æ	
Frosty does not recognize when a channel has a custom name for a 7tv emote use #209 by kenbeck13 was closed on Nov 1, 2023			÷.	
O Try emotes bug duplicate #288 by ChallDay was closed on Nov 2, 2023				
O 7tv fixed bug #286 by Zwyrolecex was closed on Nov 1, 2023			æ	
Some of my followed streamers are covered in closed captioning by a 219 by bruhcomeatme12 was closed on Oct 23, 2023			æ	
O Video signal freezes on Android Frosty app ver.3.1.4 beg #276 by Foplar was closed on Sep 19, 2023				
Other Channel's Subscriber Emotes Not Showing (1999) #274 by moorphased was closed on Nov 1, 2023				
O Unintentional automatic activation 'Closed captions'. [bug] #273 by stanzi was closed on Jun 21, 2023				
C Emote search not working on 3.1.2 [bug] #266 by hosh was closed on Jun 2, 2023			Ŧ	
O Emotes not showing up (recently) big #200 by ASSASSIN111300 was closed on Apr 29, 2023				Ç 2

Results and metrics

350,000+ downloads



Your KPIs



50,000+ monthly active users



2,500+ reviews and 4.5+ star rating



Frosty for Twitch

Tommy Chow

Contains ads

Install on more devices <

This app is available for some of your devices



15,000+ monthly website visitors



500+ stars, 1,000+ commits, and 31 releases (4 major)

Trosty Public	♡ Sponsor 🔗 Un	Din ⓒ Unwatch 6 👻 😲 Fo	ork 31 - 🖈 Starred 507 -
ᢪ main ▼ ᢪ 4 Branches 🛇 33 Tags	Q Go to file	d file 🔻 <> Code 🔻 Abo	put ශි
😿 tommyxchow Release v4.3.0 🗸	796c4d8 - last i	nonth 🕚 1,004 Commits And	nobile Twitch client for iOS and Iroid with 7TV, BetterTTV (BTTV), and
🖿 .github	Revert "Delete LC_ALL and LANG from action"		nkerFaceZ (FFZ) support. frostyapp.io
android	Release v4.3.0	last month	rrostyapp.io droid dart chat ios firebase
assets	Update Inter font to v4		
ios	Release v4.3.0	last month	ntend mobx fastlane vscode ions flutter chat-application
🖿 lib	Use tabular figures for viewer count		tter-apps flutter-examples
🖿 test	Migrate 7TV emotes to V3 API (#287)	git 3 months ago	hub-actions
🗋 .gitignore	Upgrade Flutter/Dart and dependencies (#265)	8 months ago	Readme AGPL-3.0 license
🗋 .metadata	Upgrade Flutter/Dart and dependencies (#265)		Activity
	Create LICENSE	2 years ago	507 stars
C README.md	Update README		6 watching 31 forks
analysis_options.yaml	Update to Material 3/You and other changes/fixes (#280		
D pubspec.lock	Upgrade packages	last month	eases 31
D pubspec.yaml	Release v4.3.0		v4.3.0 (Latest) last month
		+ 30	

Global audience



Future plans

Future plans

- UI/UX/design tweaks
- Moderation tools
- Better globalization
- Ultimately limited by Twitch API



Questions