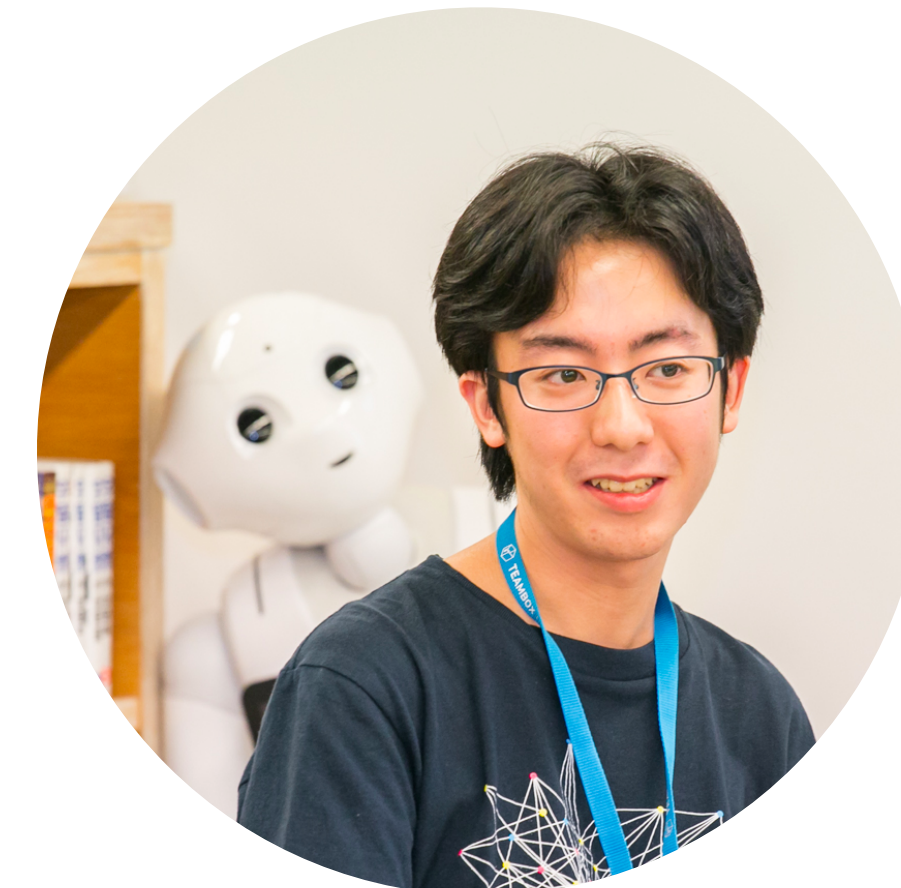


Reaction or Speculation: Building Computational Support for Users in Catching-Up Series Based on an Emerging Media Consumption Phenomenon



Riku Arakawa
CMU



Hiromu Yakura
University of Tsukuba

Equal contribution

How did this project start?



I was watching a Japanese serial TV-show as a catching-up user on Hulu. It is a fictional narrative set in an apartment building where serial murders occur.

How did this project start?



After watching the episode #4 out of 20 episodes, I googled the show to see discussions on a clue for the murderer, doing “speculation”.

How did this project start?



ゲーム参加者	書いた紙	引いた紙
101 久住	袴田吉房	細川朝男
103 田宮	この日のために	紅白別荘の管理人
104 石崎	石崎洋子	吉村
201 浮田	赤池美里	赤池幸子
202 黒島	早川教授	織田信長
203 シンイ	タカマツオ	赤池美里?
301 尾野	管理人室	
302 手塚	細川朝男	この日のために
304 北川	児嶋佳世	白紙
402 榎本	初恋の人	山際祐太郎
403 藤井	山際祐太郎	タカマツオ
502 赤池	赤池幸子	
管理人 床島	浮田	

自殺? 犯人? → X 管理人 (?)	殺した人 書いた人
犯人 → X 山際祐太郎 (藤井)	
藤井? → X タカマツオ (シンイ)	
シンイ? → X 赤池美里 (浮田)	
	X 赤池吾朗
浮田? → X 袴田吉房 (久住)	
久住? → X 児嶋佳世 (北川)	
北川? → X 浮田啓輔 (?)	
一緒にいた久住? → X 細川朝男 (手塚)	

$a_1 = a_2 = 1$
 $a_{n+2} = a_{n+1} + a_n (n \geq 1)$

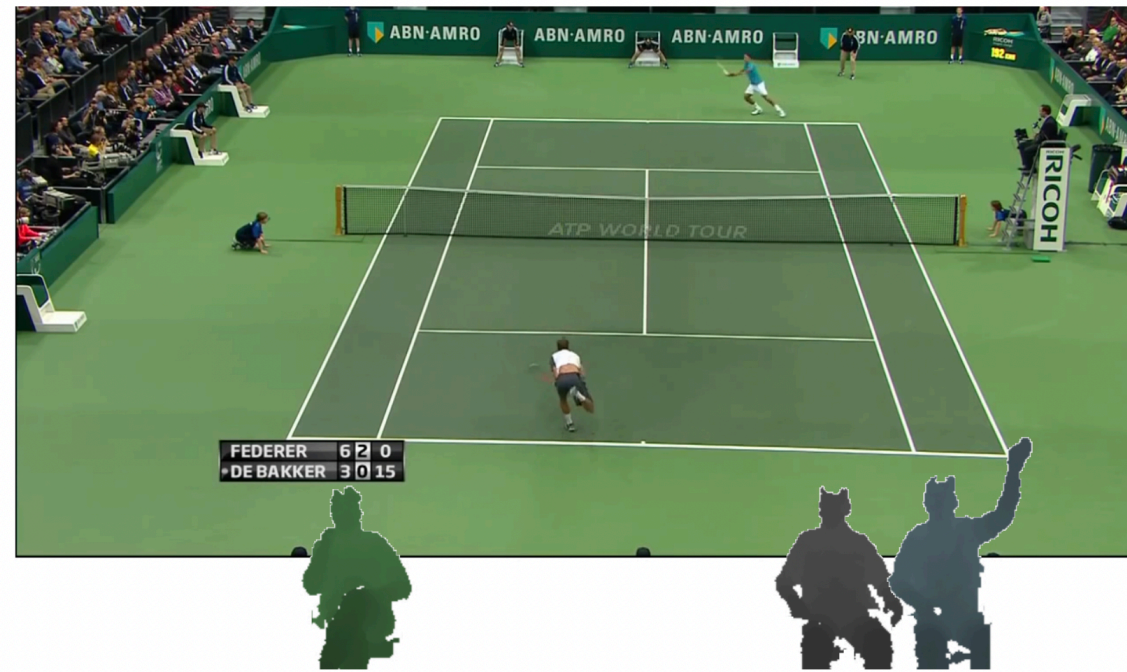
However, I encountered an article that presents the ending of the TV show — spoiler. I realized that, while speculation is a fun activity, it is dangerous for catching-up users.

Background 1: Increase in Catching-Up Users



Background 2: Social Experience in Media Consumption

Sharing Immediate Reactions



Vatavu 2015



Kim et al. 2015
Schirra et al. 2014



Wu et al. 2019

Sharing Speculations

Little research has focused on it to date, observing and analyzing the phenomenon on the Internet.

e.g.,

- Jenkins 2006, “*Survivor*” → fan community
- Gray and Mittell 2007, “*Lost*” → fan wiki

- We do not know whether catching-up users appreciate such stored discussions.
- It is possible that SNSs have significantly transformed the ways of media consumption related to speculation.

Semi-structured Interviews

- 10 Japanese participants, 30min
- To understand how people are engaging with speculation on the Internet during media consumption experiences.
 - “How do you engage with speculation, e.g., reading or posting?”
 - “How often do you engage with speculation?”
 - “What is on your mind when you engage with speculation?”
 - “What is your usual feeling after engaging with speculation?”
 - Etc

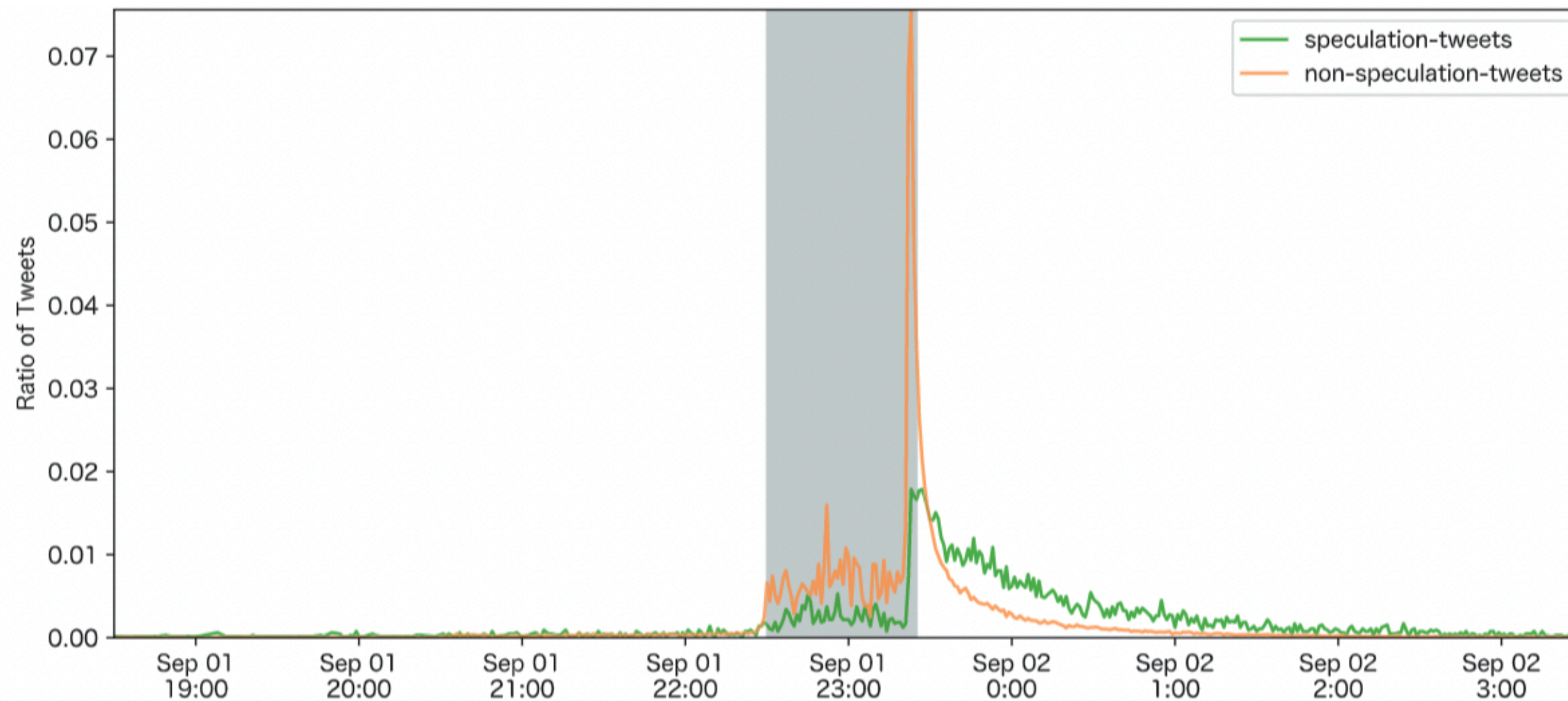
Semi-structured Interviews: Findings

- Deepening Understandings of Media Content
 - “I google the title with the word “考察” [meaning “speculation” in Japanese] and jump to them.” (P2)
 - Also, participants mentioned **various platforms**: Blogs, Twitter, and Instagram.
- Feeling a Sense of Connectedness with Others
 - “On Twitter, I can see speculations posted just after the broadcast. I like this sense of liveness with other users” (P7)
 - User behaviors could be divided into **“posters” and “lurkers”**; posters are actively involved in speculation and discussion with other users, whereas lurkers merely consume speculations posted by other users.
- Concerns About Encountering Spoiler
 - The participants expressed complaints about spoilers or **at least wished to control their exposure to such information**.
 - “I would like to take a look at speculations for each episode in order to savor it. But given the risk of spoilers, it’s hard to do.” (P3)

Tweets Analysis

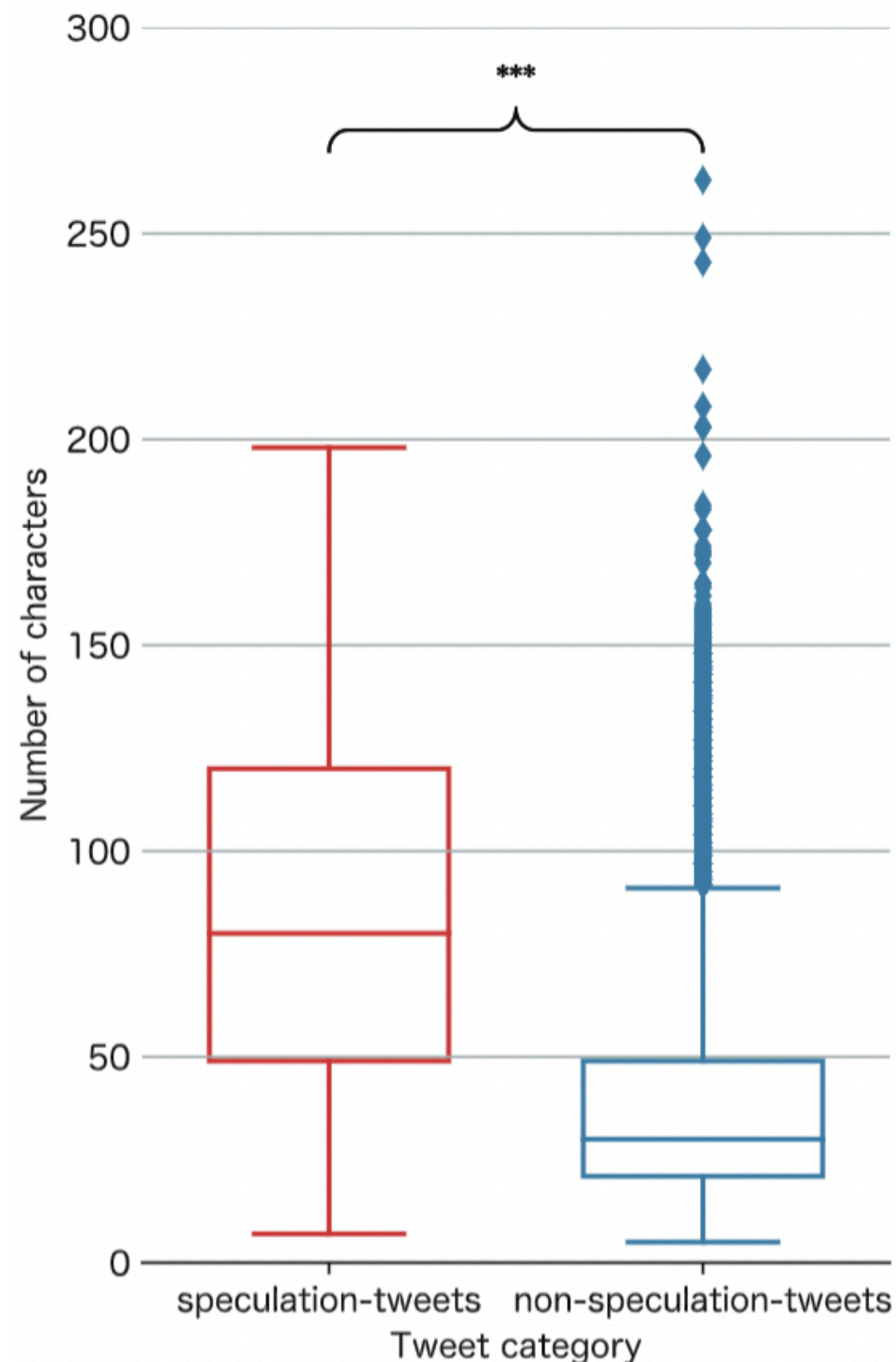
- Collected tweets about two TV series using hashtag search
 - More than 150,000 tweets in total
- Compared the characteristics of *speculation* and *non-speculation* tweets
 - Non-speculation: tweets with hashtags of the title
 - Speculation: tweets with hashtags of "[title] + 考察 (speculation)"

Tweets Analysis: Lingering Occurrence



- Aligning with the previous research on live-tweeter [52], the peak volume of *non-speculation* tweets was on the airtime.
- *Speculation* tweets were actively posted within a few hours after the end of the broadcast.
 - Viewers discussed forecasts about what will happen in the next episode, rather than sharing immediate reactions, using the hashtags.

Tweets Analysis: Lengthy and Diversified Contents



- *Speculation* tweets consisted of significantly more characters than *non-speculation* tweets.
- Speculation is contrastive to the sharing of immediate reaction.
- *Speculation* tweets contained more hyperlinks.
- Images were mainly attached to provide grounds for speculation via capture shots.
- Other tweets were often cited to develop the discussion within multiple users.

Tweet category	Hyperlink types				Total
	Images	Other tweets	YouTube videos	Blogs & other articles	
<i>speculation-tweets</i>	15.65%	4.18%	1.32%	21.38%	42.53%
<i>non-speculation-tweets</i>	8.75%	1.69%	0.28%	3.13%	13.85%

Tweets Analysis: Lengthy and Diversified Contents

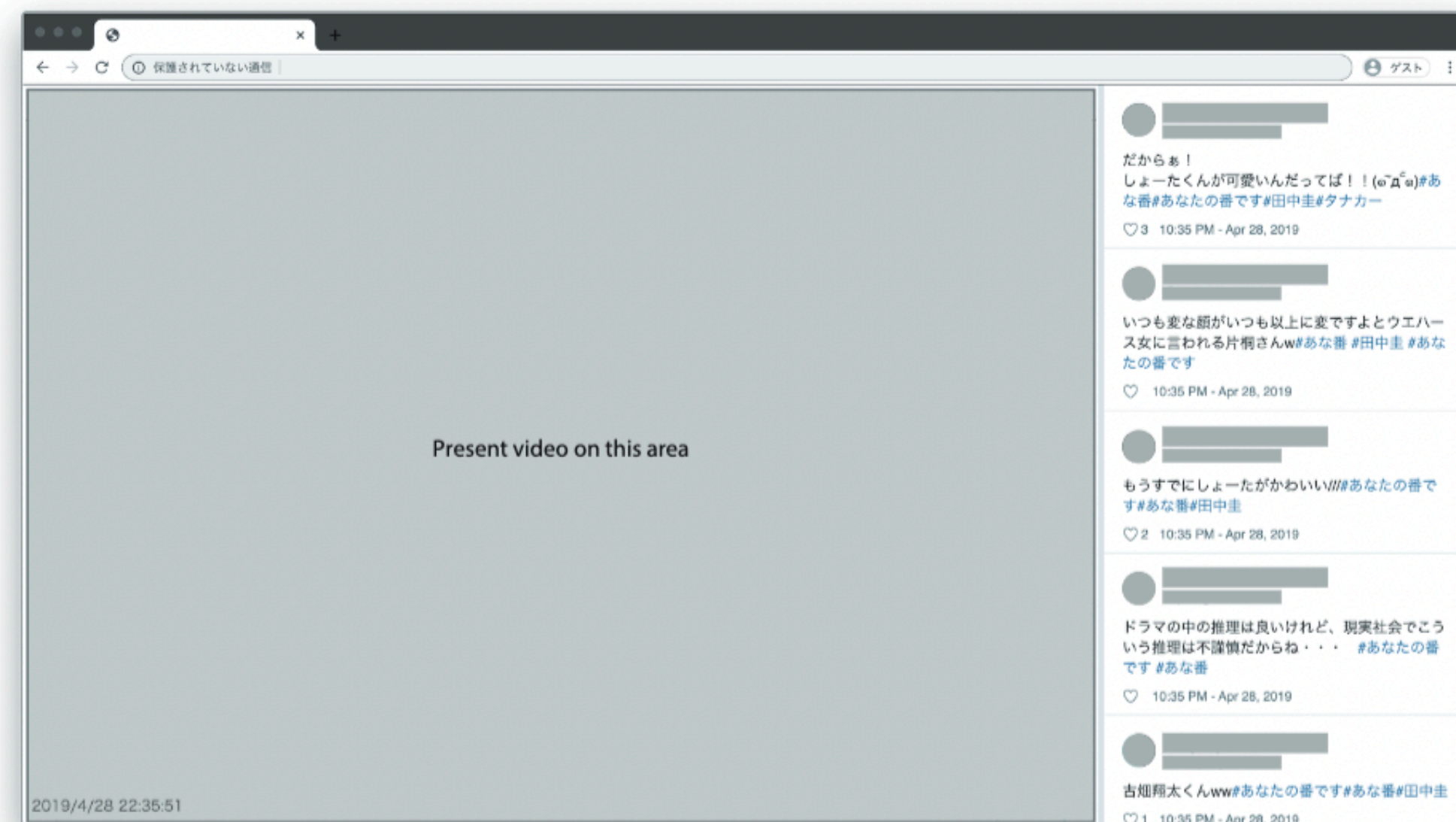
- Links to blogs and other media were also posted to share long writings about the consequence.
- We found a new usage of Twitter, in which **the screen shots of a note-taking app were attached**.
 - This was intended to share long speculative comments in a single tweet.
- While SNSs succeeded in engaging users who want to share their speculations, its function would not be optimal.
 - The risk of spoilers still remains ...



Interface for Catching-up Users

- Based on what we observed about online speculative communications, we developed supporting interfaces for catching-up users using Tweet data.

(a) Live-tweets display



- To be used while watching
- To provide *a sense of connectedness*

(b) Speculation display



- To be used between each episode
- To provide *a deeper understanding of the content*

Takeaways

- Speculation is an emerging media consumption phenomenon.
- Through speculation on the Internet, people gain deeper understanding of contents as well as an increased sense of connectedness.
- While social networking services provide the field for speculation, the risk of spoiler prevents catching-up users from engaging in speculation.
- It is possible to enhance the experience of catching-up users by developing an interaction technique centered on speculation while minimizing the risk of encountering spoilers.

Reaction or Speculation: Building Computational Support for Users in Catching-Up Series Based on an Emerging Media Consumption Phenomenon

Riku Arakawa* (CMU) and Hiromu Yakura* (Univ. Tsukuba)

- (1) We first conducted semi-structured interviews to identify how users involve with and are affected by online media consumption experiences centering on **speculation**.
- (2) We then performed quantitative data analysis of tweets about two TV series to provide background for developing computational supports for **catching-up users**, illustrating the unique aspects of **reaction- and speculation-based media consumption**.
- (3) Based on the results of (1) and (2), we carried out a user experiment and evaluated the effects of two different approaches to **enhancing the consumption experiences of catching-up users**.

- How do people engage in speculation during media consumption?
- How can catching-up users appreciate the experience?

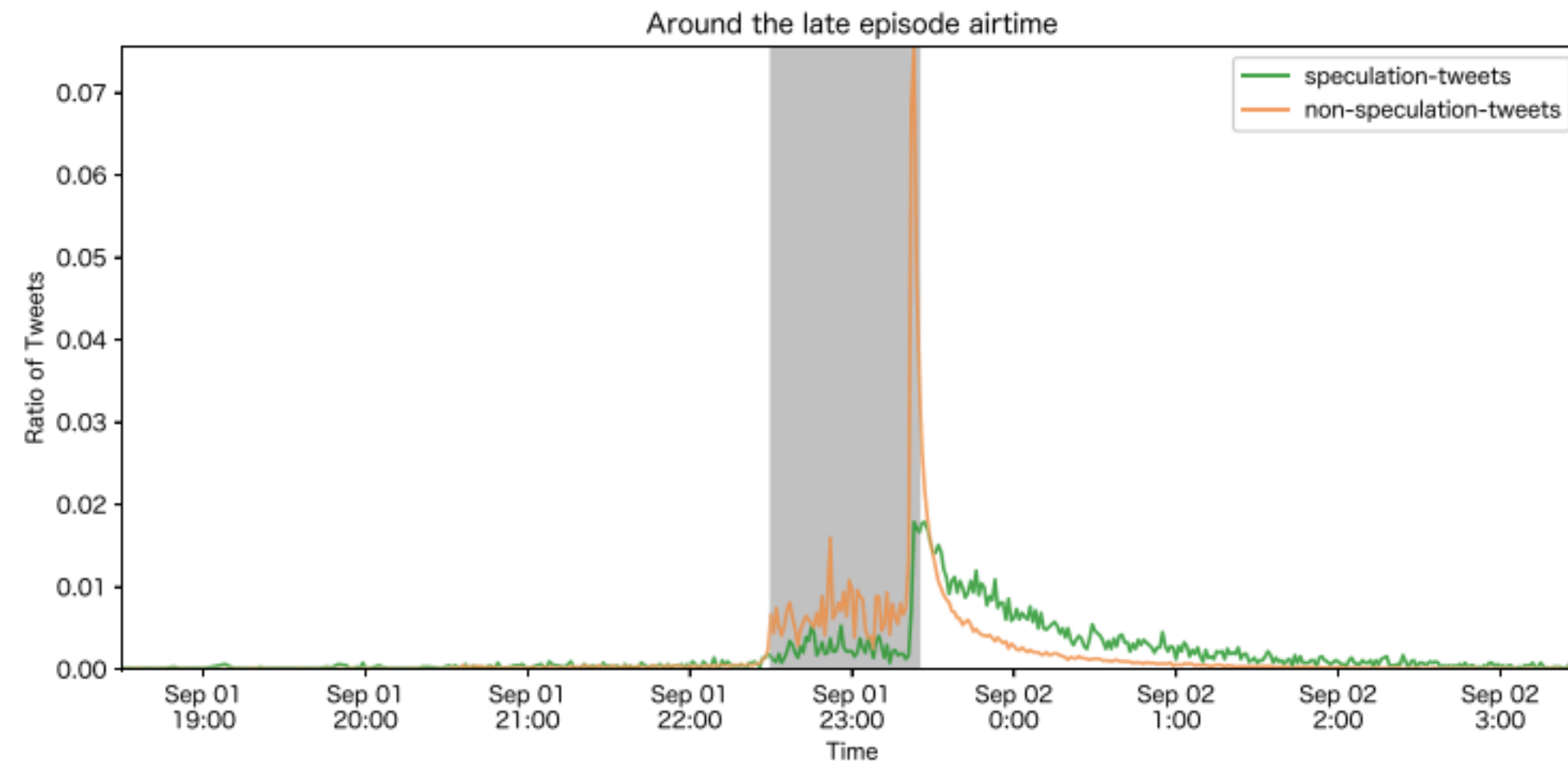


Fig. 2. Time plots of the relative volume of *speculation-tweets* and *non-speculation-tweets* during the two observed periods (top: the middle episode, bottom: the late episode) for *Your Turn to Kill* (あなたの番です). Gray backgrounds denote the airtime of each episode.

(b) Speculation display



• Semistructured Interviews

- deepen understanding of content
- feel a sense of connectedness
- concern about spoiler

• Tweet Analysis

- speculation-tweets and others
- unique aspect of speculation

• Prototype and User Study

- encounter speculation-tweets after watching every episode.
- Successfully enhanced the experience of catching-up users.