Research on Internet Traffic and Connectivity Patterns between China and the West

Chun-I Chien, supervised by Dr. Elisa Oreglia and James Burroughs

King's College London

King's Experience
King's Undergraduate Research
Fellowship/Research Award

Research Background & Aim

◆ Kar's research (Kar, 2022) highlights that India and China represented nearly 50% of global mobile traffic in 2022, a substantial increase from their 12% share a decade ago.

◆ This underscores China's remarkable technological ascent and the transformative impact of rapid internet technology development, making internet traffic a crucial aspect of digital world.

◆ To investigate differences in internet traffic among Chinese and Western applications.

Method

◆ Data Sources:
Google Play Store and Tencent App Store

◆ Data Collection Period: 2018-01-01~2021-01-01

◆ Importance of Third-Party App Stores in China:
due to the absence of Google Play Store on some smartphones produced in China, this ensured that our data collection was more comprehensive and accurate.

◆ Data Collection Process:
1. Deciding the target compared applications

App from west:

Facebook

Twitter

App from China:

Zhifubao

QQ

Xiaohongshu

Dual version:
International vs Chinese

AliExpress

Taobao

Wechat/Weixin

Tiktok/Douyin

2. Using Python Code given by James Burroughs, team's Digital Methods Specialist to obtain required data

Data Analysis

◆ Outputting HTML Data:
1. the version code of the application between 2018 and 2021
2. the subdomain of each app
3. the exact count value of how many URLs under each subdomain
4. the frequency: a more intense shade of red means a larger share of URLs under the subdomain

◆ Analyzing the Most Frequent Subdomains

Result

◆ When considering frequency as an indicator of popularity trends, Facebook, Twitter, Xiaohongshu, and Zhifubao all showed an increasing trend in popularity from 2018 to 2021.
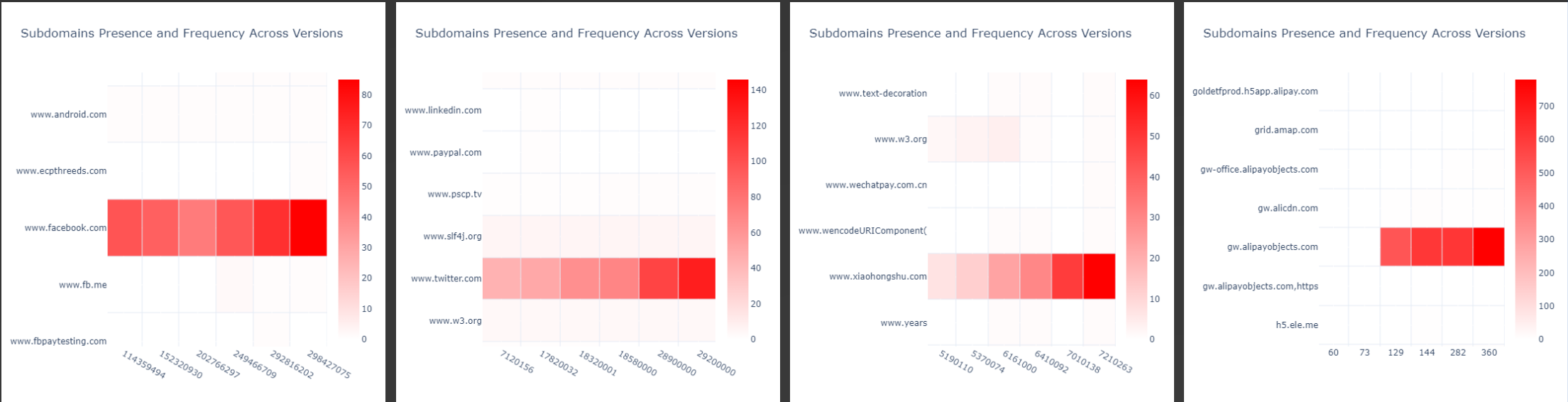

www.facebook.com   www.twitter.com   www.xiaohongshu.com   zhifubao

◆ WeChat International and WeChat China versions yielded consistent HTML data, with the primary difference being more frequent updates in the international version.
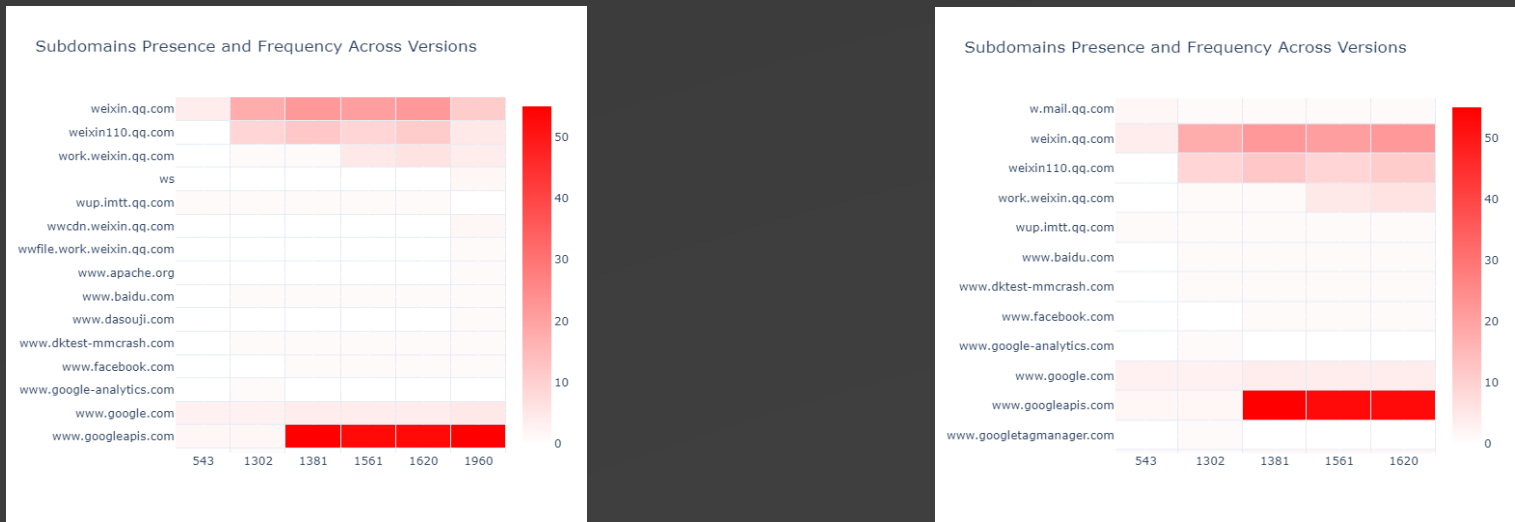
Wechat international   Weixin 微信 (Wechat China)

◆ TikTok and Douyin primarily use different APIs, with TikTok relying significantly more on Google APIs.
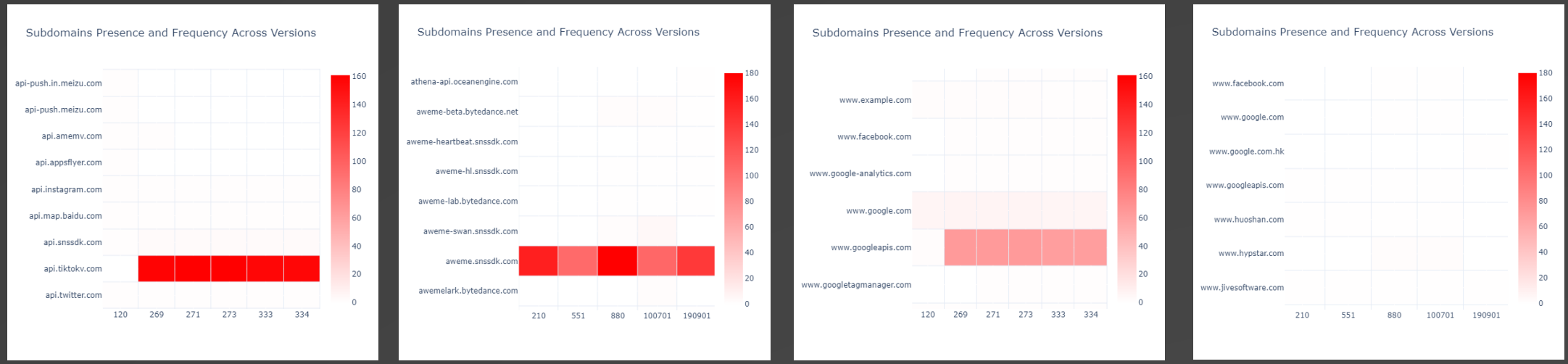
Tiktok (International)   Douyin (China)   Tiktok (International)   Douyin (China)
api.tiktokv.com   aweme.snssdk.com   www.googleapis.com   www.googleapis.com

◆ Excluding TikTok and Douyin, other Chinese apps demonstrated a higher frequency and quantity of Google API usage compared to Western apps.

Facebook subdomain(z value) www.googleaips.com	frequency	Twitter subdomain(z value) www.googleapis.com	frequency
5	5~10	2	0-10
5	5~10	2	0-10
2	0-5	2	0-10
2	0-5	2	0-10
2	0-5	2	0-10
2	0-5	2	0-10

xiaohongshu subdomain(z value) www.googleapis.com	frequency	Wechat (International) subdomain(z value) www.googleapis.com	frequency	Wechat (Chinese) subdomain(z value) www.googleapis.com	frequency
0	0	2	0-10	2	0-10
0	0	2	0-10	2	0-10
0	0	55	40-50	55	40-50
29	20-30	53	40-50	53	40-50
29	20-30	53	40-50	53	40-50
0	0	55	40-50		

◆ QQ's data did not reveal any significant patterns or findings.

Conclusion

◆ Popularity Trends: Facebook, Twitter, Xiaohongshu, and Zhifubao demonstrated increasing popularity trends from 2018 to 2021, indicating their appeal in both Chinese and Western markets.

◆ WeChat Consistency: WeChat International and WeChat China versions showed data consistency, with the international version featuring more frequent updates. This suggests WeChat's maintenance of similar connectivity patterns globally and domestically.

◆ TikTok vs. Douyin: TikTok and Douyin employed different APIs, with TikTok relying heavily on Google APIs. This underscores significant technological distinctions catering to varied markets and demographics.

◆ Google API Usage: Except for TikTok and Douyin, other Chinese apps surpassed Western apps in both frequency and quantity of Google API usage, reflecting differing degrees of reliance on the global internet ecosystem.

◆ QQ's Performance: QQ's data yielded no discernible patterns, warranting further in-depth research into its internet traffic and connectivity patterns.

Reference

◆ Kar, A. (2022). End of American internet, India-China contribute to 50% of world's data traffic. [online] BusinessLine. Available at: https://www.thehindubusinessline.com/info-tech/end-of-american-internet-india-china-contribute-to-50-of-worlds-data-traffic/article66222842.ece [Accessed 5 Oct. 2023].