

Graphika



#OperationFFS: Fake Face Swarm

A Joint Report by Graphika
& the Atlantic Council's Digital Forensics Research Lab

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Operation #FFS: Fake Face Swarm

Facebook Takes Down Network
Tied to Epoch Media Group That
Used Mass AI-Generated Profiles

Executive Summary

On December 20, 2019, Facebook [took action](#) against a network of over 900 pages, groups, and accounts on its own platform and on Instagram that were associated with “The Beauty of Life” (TheBL),¹ [reportedly an offshoot](#) of the Epoch Media Group (EMG).² These assets were removed for engaging in large-scale [coordinated inauthentic behavior \(CIB\)](#).³ The takedown also encompassed a set of Vietnamese assets that were linked to TheBL and to EMG.

TheBL Facebook page claimed that “Truth in Content is our purpose,”⁴ but Facebook said that the operators behind this network “made widespread use of fake accounts — many of which had been automatically removed by our systems — to manage Pages and Groups, automate posting at very high frequencies and direct traffic to off-platform sites. Some of these accounts used profile photos generated by artificial intelligence and masqueraded as Americans to join Groups and post the BL content.”

The network was not the largest (by number of assets) Facebook has taken down this year: a takedown in [Honduras](#) in July included over 1,400 pages.⁵ But the assets in TheBL portfolio spent over 9 million US dollars on advertising and amassed about 55 million followers, making it nominally the largest takedown by those metrics, although it is not clear how many of the followers were real users. Most of the followers were outside the United States.

Before the action, Facebook shared a list of page and group names with Graphika and the Atlantic Council’s Digital Forensic Research Lab (DFRLab) for independent analysis. Our research focused on the assets’ content and behavior and highlighted the following key points:

- Facebook groups in this set were heavily populated by fake accounts.⁶ In some cases, every administrator of a group was a fake account.

¹ Nathaniel Gleicher, “Removing Coordinated Inauthentic Behavior From Georgia, Vietnam and the US”, Facebook, December 20, 2019, <https://about.fb.com/news/2019/12/removing-coordinated-inauthentic-behavior-from-georgia-vietnam-and-the-us/>.

² Alex Kasprak and Jordan Liles, “EXCLUSIVE: Expanding Pro-Trump Outlet ‘The BL’ Is Closely Linked to The Epoch Times,” Snopes, October 11, 2019, <https://www.snopes.com/news/2019/10/11/pro-trump-outlet-linked-epoch-times/>.

³ Nathaniel Gleicher, “Coordinated Inauthentic Behavior Explained,” Facebook, December 6, 2018, <https://about.fb.com/news/2018/12/inside-feed-coordinated-inauthentic-behavior/>

⁴ “All citizens strive for TRUTH IN CONTENT,” states their description in all caps.

⁵ Nathaniel Gleicher, “Removing Coordinated Inauthentic Behavior in Thailand, Russia, Ukraine and Honduras,” Facebook, July 25, 2019, <https://about.fb.com/news/2019/07/removing-cib-thailand-russia-ukraine-honduras/>.

⁶ In this context, “a fake account is an account where someone is pretending to be something or someone that doesn’t exist. Fake accounts can include accounts for fake or made up people, pets, celebrities or organizations.” See: https://www.facebook.com/help/306643639690823?helpref=uf_permalink.

- Dozens of these fake accounts had profile pictures generated by artificial intelligence (AI), in the first large-scale deployment of fake faces known to the authors of this report.
- Other fake accounts used profile pictures taken from elsewhere online, sometimes with little regard to the apparent sex of the persona they were adopting.
- Some of these fake accounts were created in batches just a few minutes apart.
- Automation was also used for posting: some of the fake accounts used an automation tool called Postcron, allowing them to maintain their rates of posting with no human intervention.
- Many of the fake accounts almost exclusively shared posts from the TheBL, with a small mixture of content from the Epoch Times, pointing real users toward its website and Facebook Page.
- Many of the groups focused on US politics but were partly or primarily managed from Vietnam.
- The campaign extended beyond Facebook. Notably, TheBL Twitter accounts, @TheBLNews and @TheBLcom, showed signs of inauthentic amplification. Both accounts were significantly retweeted by accounts that have since been suspended. A YouTube channel branded to TheBL also showed a pattern of viewing that suggests inauthentic boosting.

This activity was pervasive across a significant number of groups and appeared to constitute a large-scale and systematic attempt to boost TheBL properties on Facebook and the wider internet using a range of inauthentic techniques. The strong focus on supporting President Trump from pages managed in Vietnam may also indicate a desire amplify pro-Trump messaging throughout the 2020 election.

The Beauty of Life

The Beauty of Life was an online content provider that [described](#) its mission as “to present to the world the most beautiful aspects of life. We focus on content that represents fundamental moral standards and values, to enlighten all who prefer to be inspired. We uphold traditional cultures and upright beliefs.”⁷ Its mission statement made a strong case against misinformation: “Inaccurate and degenerate information can be easily channeled toward vulnerable or uninformed people, who then transmit these corrupt messages back into society, often creating a vicious cycle of misinformation.”

⁷ https://www.facebook.com/pg/TheBLcom/about/?ref=page_internal.

TheBL ran three main Facebook pages in English, [TheBL.com](#), [TheBLTV](#),⁸ and [The BL Stories](#),⁹ together with pages in [Spanish](#),¹⁰ [Portuguese](#),¹¹ and [Chinese](#).¹² It also ran a cluster of websites: theBL[.]com in English, BLes[.]com in Spanish, and BLdaily[.]com in Chinese.

The content across the network varied widely. Some was apolitical, potentially clickbait content, featuring heartwarming stories of animal and human devotion.



Post from [BLNoticias](#) sharing a “feel good” article from the Spanish BLes.com.

Some TheBL content was more political and focused on China and the ruling Chinese Communist Party (CCP). Coverage on these issues was consistently hostile toward China. It included accusations that China is interfering in Taiwan’s elections and that the CCP is launching World War Three.

⁸ <https://www.facebook.com/TheBLTV/>.

⁹ <https://www.facebook.com/The-BL-Stories-991079371077992/>.

¹⁰ <https://www.facebook.com/BLNoticias>.

¹¹ <https://www.facebook.com/Belezas-da-Vida-352542148583765/>.

¹² <https://www.facebook.com/BeautiesLifeInspired>.



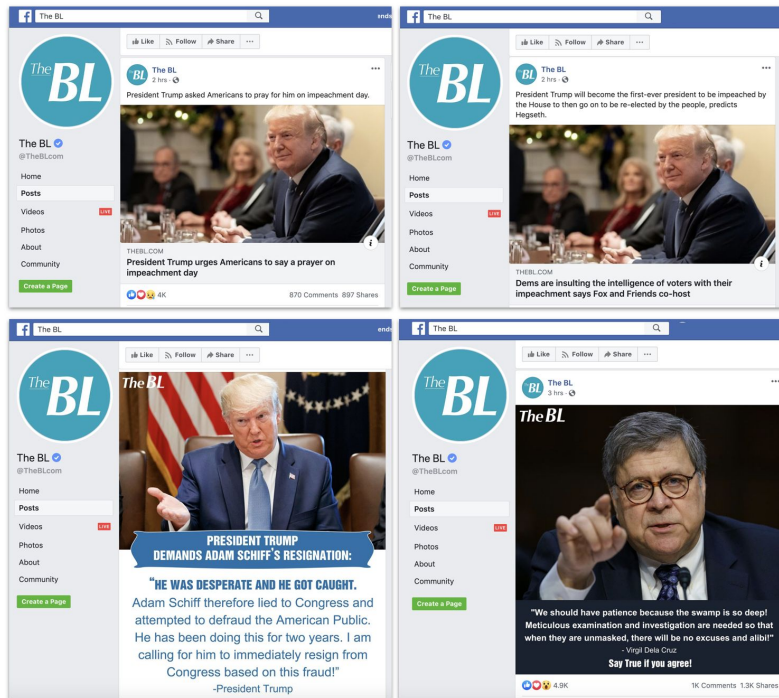
Posts from BeautiesOfLifeInspired on the CCP, posted just 12 minutes apart on December 18, 2019. The articles shared were all from BLDaily[.]com.

The anti-Chinese content featured across languages, as in this video (subtitled in Portuguese) on Chinese prisons.



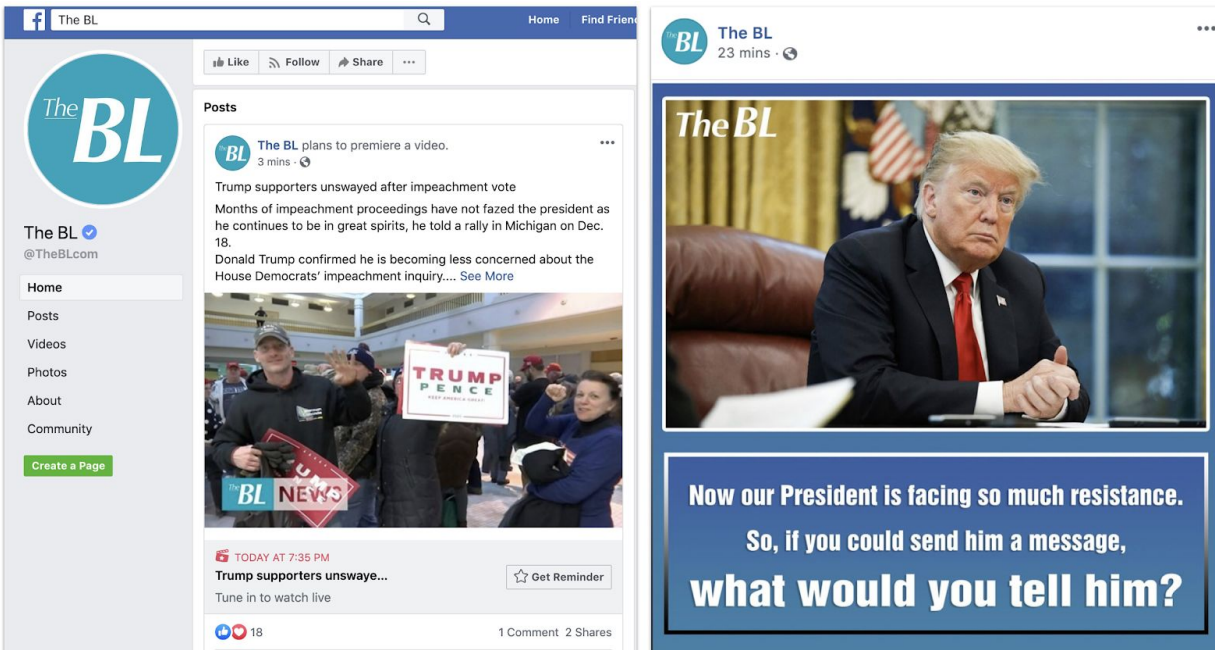
Post from TheBL Portuguese Page, sharing a video from TheBL.

The English-language assets focused heavily on positive coverage of US President Donald Trump and his supporters, interspersing articles from TheBL.com with pro-Trump memes and inviting users to comment on some of the more partisan content. This activity also included 86 groups with explicitly pro-Trump names, such as "Patriots for President Trump 2020 #KAG," "President Trump for President 2020 # KAG," and "Hispanos por Trump."



Posts by TheBL.com Facebook Page on December 17-18, 2019.

The content was strongly partisan, referring to Trump as “our president” and providing substantial coverage of his public appearances.



Posts about Trump from TheBLcom on December 19, 2019.

Alongside pro-Trump material, these assets posted large quantities of material attacking his critics and rivals, often presenting users with a partisan statement and urging them to respond if they agreed.



"Say true if you agree": posts on TheBLcom on December 19, 2019.

Facebook took action against TheBL assets for engaging in coordinated inauthentic behavior, not because of the content they posted on platform. The above posts are therefore primarily intended for illustration, not to analyze the reasons for the action. In one way, however, they are significant: the combination of pro-Trump and anti-CCP content closely matches the editorial line of the Epoch Media Group (EMG), publisher of the Epoch Times newspaper.

In October 2019, researchers at the US-based fact-checking organization Snopes [reported](#) that TheBL was connected with the Epoch Media Group, based on commonalities in their personnel and technical infrastructure.¹³

Both the Epoch Times and TheBL denied any connection, but Facebook's takedown statement said, "Although the people behind this network attempted to conceal their identities and coordination, our investigation linked this activity to Epoch Media Group, a US-based media organization, and individuals in Vietnam working on its behalf." Some of the assets in the set appeared to confirm the link.

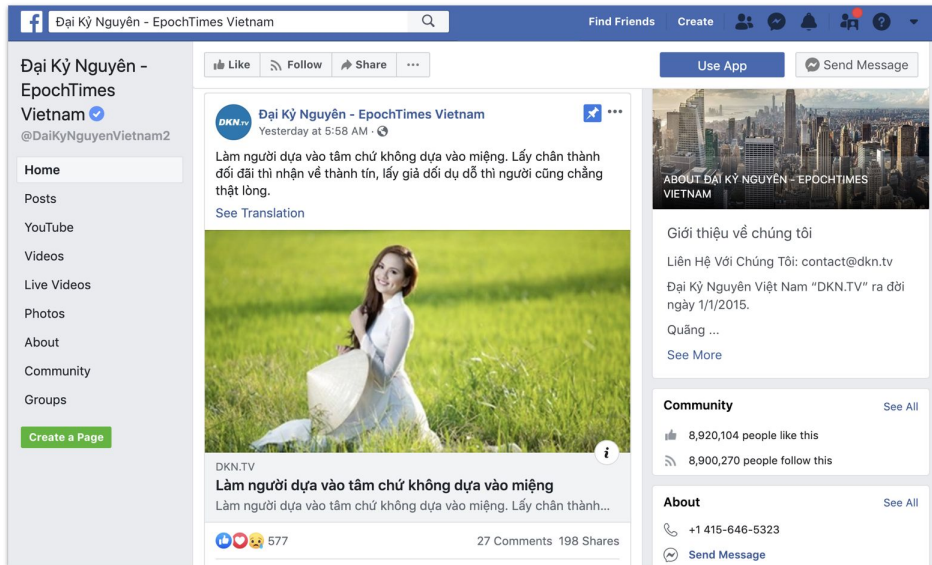
Epoch Times Vietnam

Facebook's takedown also encompassed a number of Vietnamese-language pages that were directly linked to the Epoch Times. One [verified page](#) with almost 9 million followers was called "Đại Kỷ Nguyên - EpochTimes Vietnam"¹⁴; [another](#), with 12.6 million followers, was called "Đại Kỷ Nguyên."¹⁵

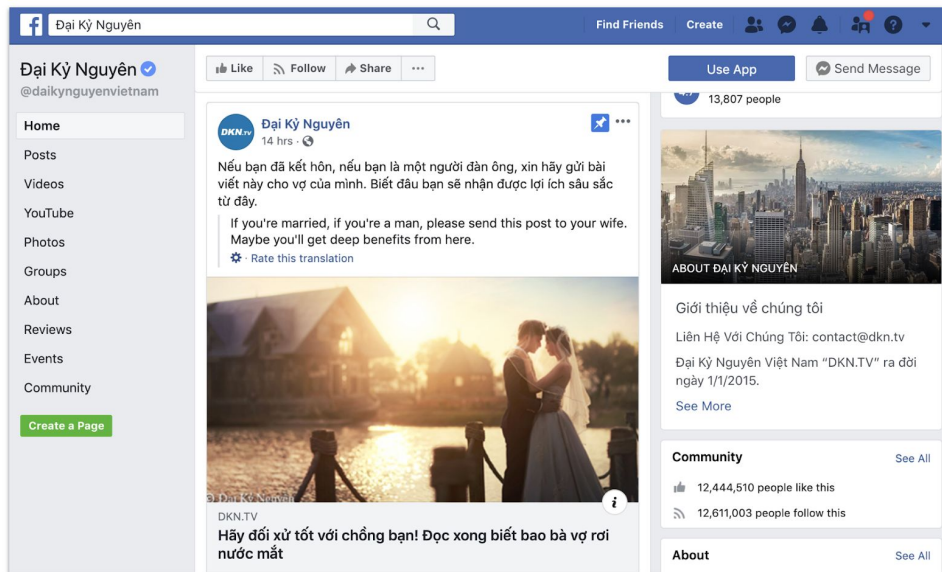
¹³ Alex Kasprak and Jordan Liles, "EXCLUSIVE: Expanding Pro-Trump Outlet 'The BL' Is Closely Linked to The Epoch Times," Snopes, October 11, 2019, <https://www.snopes.com/news/2019/10/11/pro-trump-outlet-linked-epoch-times/>.

¹⁴ <https://www.facebook.com/DaiKyNguyenVietnam2/>.

Another [page](#), “Đại Kỷ Nguyên - Văn hóa,” directly mentioned its affiliation with Epoch Times in its about section, listing the Epoch Times Online as a “product.”¹⁶



Home sections for the two main assets (above and next page).



¹⁵ <https://www.facebook.com/daikynguyenvietnam/>.

¹⁶ <https://www.facebook.com/pg/DaiKyNguyenVanhoa/>.

The screenshot shows the Facebook profile page for 'Đại Kỷ Nguyên - Văn hóa'. The profile name is 'Đại Kỷ Nguyên - Văn hóa' with the handle '@DaiKyNguyenVanhua' and 764K followers. The bio reads 'Mang đến giá trị cuộc sống'. The 'About' section is expanded, showing 'MORE INFO' with the following details:

- Release Date:** January 30, 2015
- About:** Mang đến giá trị cuộc sống
- Founding Date:** September 2003
- Awards:** 2013 Society of Professional Journalists' Sigma Delta Chi; Award: Non-deadline Reporting, Series on murder for organs in Chinese state hospitals; 2012 New York Press Association award: Best Special Section, Asia Week 2012.
- Products:** - The Epoch Times Online; - A weekly or biweekly newspaper in many other parts of the world; - An editorial series that inspired one of the largest peaceful movements in existence today.

Screenshot of the About section for “Đại Kỷ Nguyên - Văn hóa” listing The Epoch Times Online as a product, along with newspapers globally.

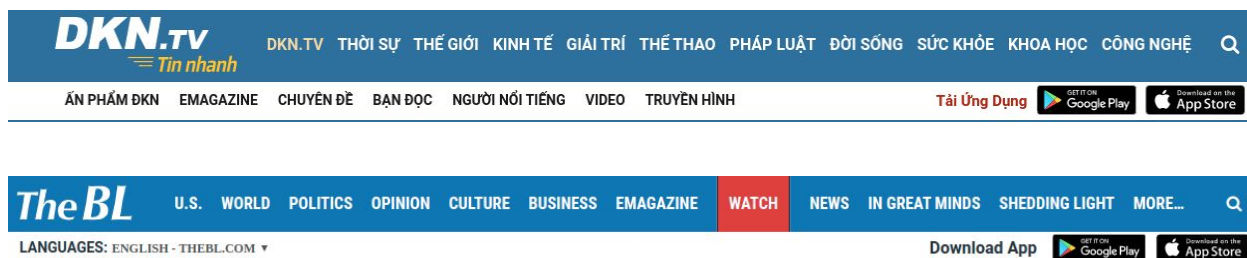
Alongside this affiliation to the Epoch Times, the pages were also linked to TheBL. The About section of all three pages linked to the same website, dkn[.]tv, whose full title is “Đại Kỷ Nguyên,” the same as the Facebook pages.

At the foot of dkn[.]tv’s homepage, a “links” section pointed to five websites. The first, “Tin nhanh” or “fast news,” linked to a subdomain of the main dkn[.]tv domain: tinnhanh.dkn.tv/. The other four were the various language versions of TheBL. They also appeared to use a similar theme for both dkn.tv and thebl[.]com, the latter of which shows dkn.tv as its Vietnamese-language outlet.

Video	Live TV	Liên kết
Văn hóa – Nghệ thuật	Tin thời sự	Tin nhanh
Đời sống	Tin nhanh	English - TheBL.com
Sức khỏe	Góc nhìn	中文 - Bldaily.com
Câu chuyện	Đời sống	Español - Bles.com
Sự thật	Sức khỏe	Português - Pt.Bles.com
Lắng đọng đêm về	Tổng Thống Trump	

Đại Kỷ Nguyên Copyright © 2015 - 2019

Screenshot of the footer of dkn[.]tv, showing the links to TheBL assets.



Web banners for dkn[.]tv (above) and thebl[.]com.

These Vietnamese-language pages covered a wide range of topics, lifestyle and culture having a heavy presence in addition to political and world news. Their political posts on US politics, when translated, often seemed to avoid taking a position, and instead stayed fairly neutral in their language; the articles they linked to were often much more slanted. The US political content tended to be supportive of Donald Trump; the top Trump-related headline on the site on December 19, 2019 regarded his fundraising haul of \$5 million on the day of his impeachment. The pages' posts on Facebook reflected this, using the pro-Trump outlet Breitbart as a source and repeating Trump's statements on the impeachment.

Điểm tin thế giới chiều 19/12: Chiến dịch của Tổng thống Trump gây quỹ hơn 5 triệu USD vào đúng ngày bỏ phiếu luận tội

Dkn[.]tv headline the day following Trump's impeachment discussing his fundraising.



Example posts from "Đại Kỳ Nguyên - Tin nhanh," their "Quick News" outlet.

These pages' focus on China and surrounding issues, such as the Hong Kong protests, was likewise somewhat tempered in their Facebook posts and not nearly as prominently featured as it was on the related website. Across the different pages, the most recent article related to Hong Kong was about the suspension of civil servants during an investigation, and the site's top headline was about the Hong Kong protesters wanting other world leaders to follow the US in supporting the protests.



Translated version of the top headline on dkn[.]tv on December 19, 2019.

Behavioral Patterns

Some of the engagement on TheBL's properties appeared authentic (that is, appeared to have originated from real users engaging with this content), but most comments, reactions, and likes were

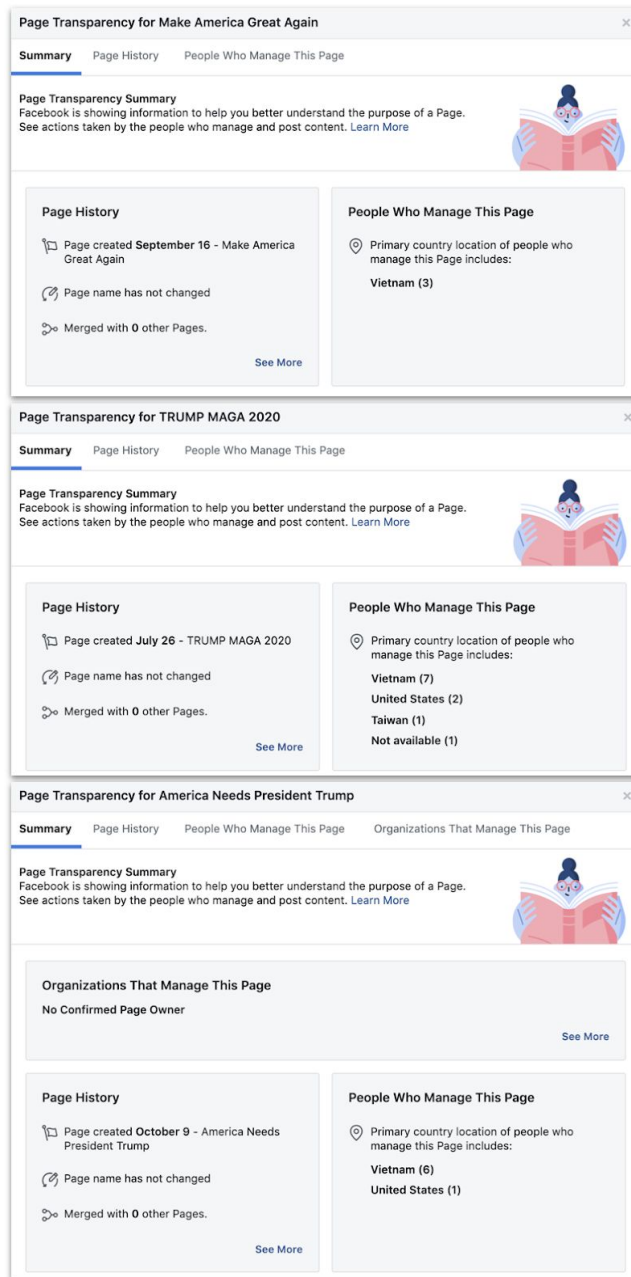
greatly boosted by inauthentic behavior and inauthentic accounts, on an industrial scale. Fake accounts served as the administrators of Facebook groups, increased the membership numbers of those groups, liked posts on the Pages, and posted large quantities of content from TheBL-related assets.

This structure constituted a large-scale artificial amplification factory whose only observable function was to boost content from TheBL and, to a lesser extent, from the Epoch Times.

Clusters of fake admins

Fake accounts were a major feature of this network. Their frequency across the set varied from region to region.

The most massive collection of fake accounts in this set was concentrated in a cluster of over 80 groups and pages dedicated to US President Donald Trump. Almost all the accounts administering these assets were fakes. These assets had strongly patriotic American names, such as “America Needs President Trump,” “Trump for America’s President,” and “WE STAND WITH TRUMP & PENCE!”, but transparency tools showed that the administrators for these pages were primarily based in Vietnam.

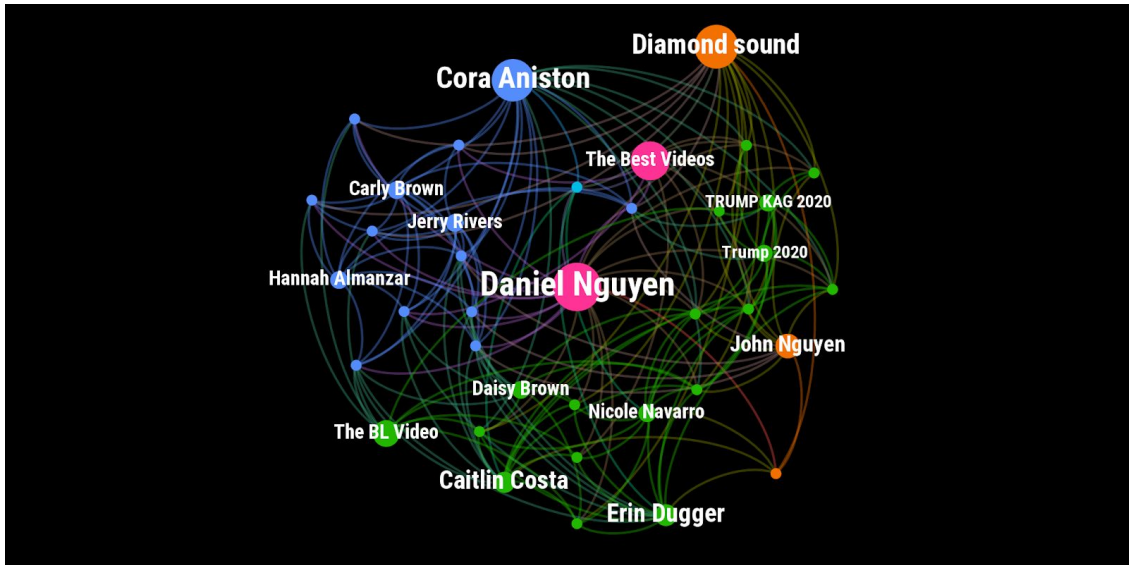


Page transparency for “[America Needs President Trump](#),” “[TRUMP MAGA 2020](#),” and “[Make America Great Again](#),” showing the predominance of admin locations in Vietnam.¹⁷

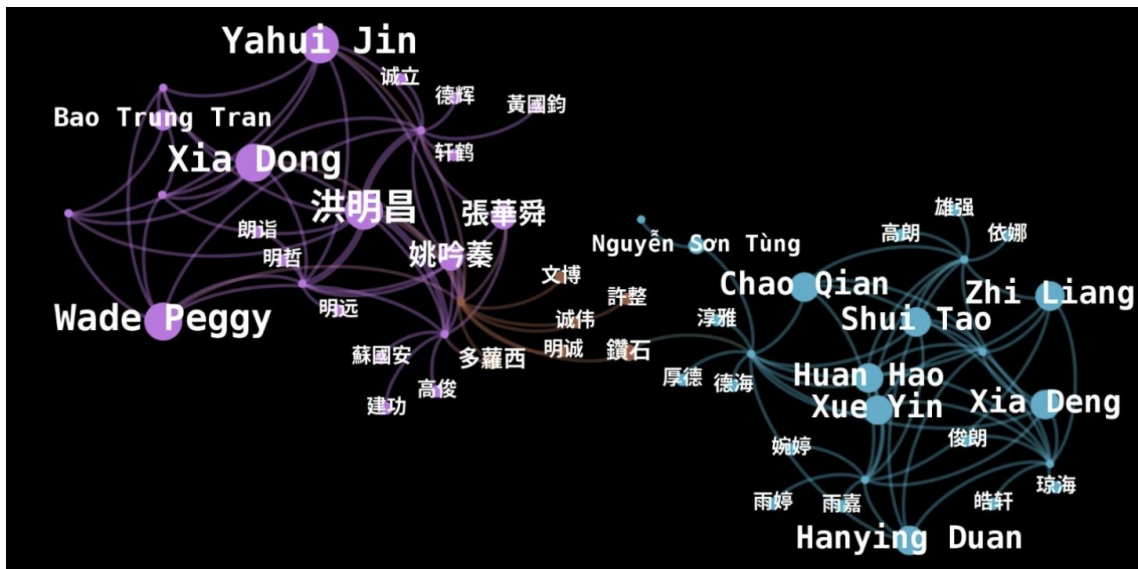
Most of the groups had between eight and 12 admins, although the number fluctuated as fake accounts were suspended; at least one group had no admins left at all by the time this analysis began. Many of the accounts managed multiple groups, with some accounts involved in running more than a

¹⁷ <https://www.facebook.com/America-Needs-President-Trump-113411710067544/>;
<https://www.facebook.com/TRUMP-MAGA-2020-106083217394997/>;
<https://www.facebook.com/Make-America-Great-Again-105692740827005/>.

dozen groups each. These fake accounts formed tightly connected clusters, with the same accounts managing the same sets of groups and posting content from TheBL (and occasionally the Epoch Times) into those groups.



Network graph of the relationship between core accounts that managed US-focused groups in TheBL network, with the size of the node indicating the number of groups the account administered (filtered by degree range 2 and k-core 6).



Network graph of the relationship between core accounts that managed groups focused on Taiwan, Hong Kong, and China, with the size of the node indicating the number of groups the account administered (filtered by degree range 2 and k-core 6). The three main accounts at the top left, Yahui Jin, Xia Dong, and Wade Peggy, and the main accounts at the bottom right, all used stolen profile pictures and are discussed below.

The overwhelming majority of all the content these pages and groups posted came from one of TheBL assets, either on Facebook or on external websites. In effect, other assets served as an amplification system, boosting content from TheBL through systematic and large-scale false activity. The network of fake admins were central to that effort.



Shares of content from TheBL[.]com, BLDaily[.]com, and The BL Video to a US-focused group, a Taiwan-focused group, and a US-focused page.

People who never were: AI-generated faces

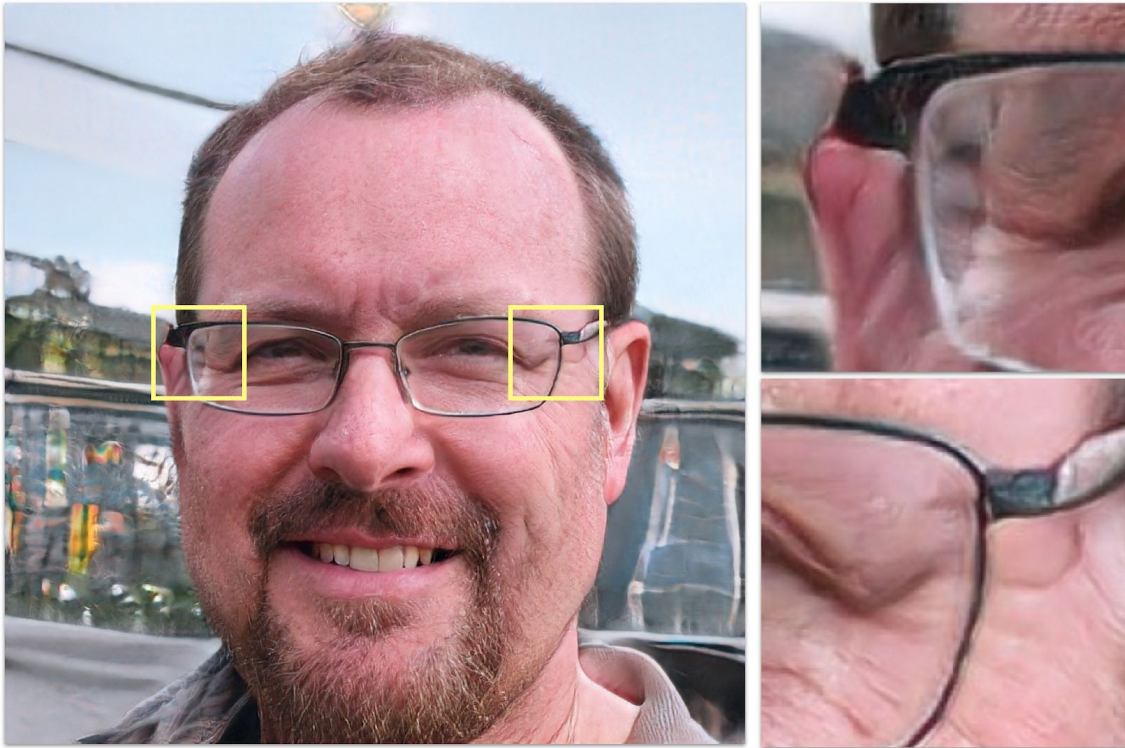
Many of the fake admins and group members had profile pictures that appear to have been generated by a type of artificial intelligence (AI) called generative adversarial networks (GAN)¹⁸: they were pictures of people who have never existed.

GANs are neural networks that compete against another to generate new data, for instance images that look like real human faces, although they do not belong to a real person. Although this innovation in machine learning has been around since 2014, the ability to generate such pictures became more visible to the general public in February 2019, with the launch of a website called [thispersondoesnotexist\[.\]com](https://thispersondoesnotexist.com) that uses GAN technology to generate fake faces. It is unclear from forensic traces whether TheBL operators used this website to source the picture, as they could have also used a GAN on their own.

TheBL network is the first time the authors have seen AI-generated pictures deployed at scale to generate a mass collection of fake profile pictures deployed in a social media campaign.

This technology is rapidly evolving toward generating more believable pictures, but a few indicators still give these profile pictures away. Images generated by the current state of GANs are notorious for struggling with features that should be symmetrical on the human face, such as glasses or earrings, and with background details. Profile pictures from the network showed telltales of all three.

¹⁸ See Goodfellow, Ian, Jean Pouget-Abadie, Mehdi Mirza, Bing Xu, David Warde-Farley, Sherjil Ozair, Aaron Courville, and Yoshua Bengio. "Generative adversarial nets." In *Advances in neural information processing systems*, pp. 2672-2680. 2014. Or for the shorter version, an explainer on YouTube: https://www.youtube.com/watch?v=8Tvn67gO8DQ&feature=emb_title.



Profile picture for "[Alfonzo Macias](#)"¹⁹ an admin on a group in this cluster. Note the asymmetry in the glasses and also the poorly defined background. The authors checked this image with experts at the University Federico II of Naples,²⁰ who assessed that this image was GAN-generated with 99.9 percent certainty.²¹

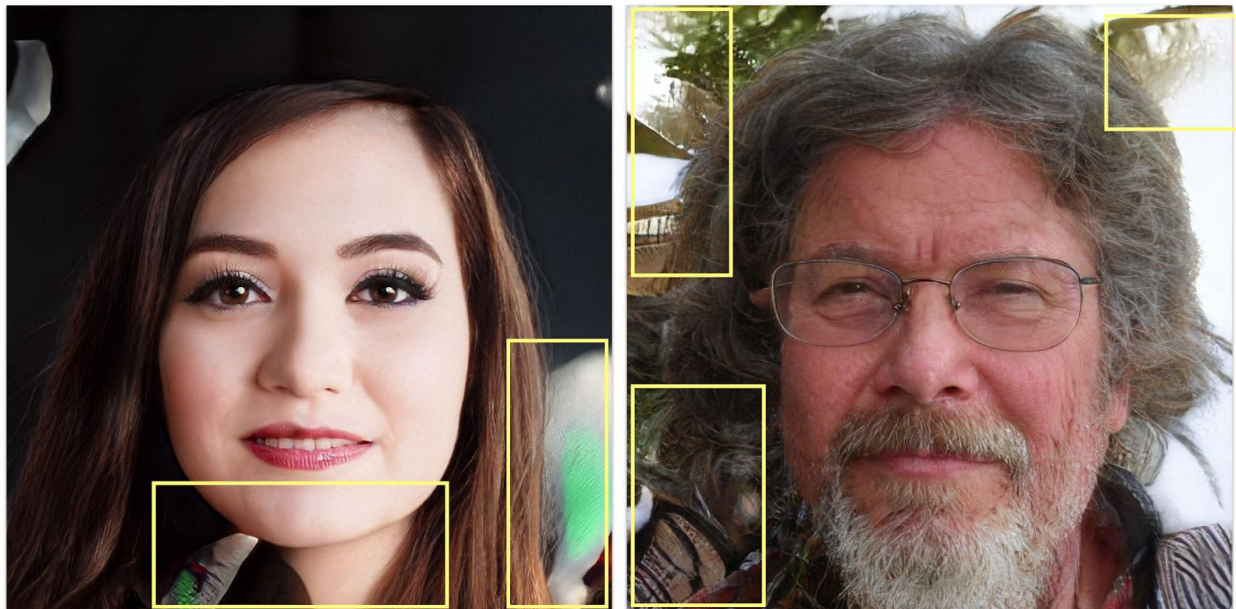
¹⁹ <https://www.facebook.com/alfonzo.macias.589>

²⁰ We're deeply grateful to Luisa Verdoliva and Francesco Marra. Readers who are hungry for more technical details are encouraged to read the paper describing the methodology that was applied to this set: F. Marra, D. Gragnaniello, D. Cozzolino, L. Verdoliva, "Detection of GAN-generated fake images over social networks", 1st IEEE International Workshop on "Fake MultiMedia", Miami (USA), April 2018.

²¹ The authors typically blur the faces of individuals involved in online influence operations, to avoid violating their privacy. In this case, however, there is no current indication that any such individual actually exists, rendering the question of privacy moot.



Profile picture for "[Teresa Taylor](#),"²² an admin on a group in this cluster. Note the asymmetry in the earrings. The authors checked this image with experts at the University Federico II of Naples, who assessed that this image was GAN-generated with 99.9 percent certainty.



Profile pictures for "[Mary Keen](#)"²³ and "[Jacobs Guillermo](#)"²⁴ both admins on groups in this cluster. Note the strange dimensions of Mary's neck and the distorted backgrounds. The authors checked these images with experts at the University Federico II of Naples, who assessed that both images were GAN-generated with 100 percent certainty.

²² <https://www.facebook.com/profile.php?id=100044137683587>.

²³ <https://www.facebook.com/mary.keen.5201>.

²⁴ <https://www.facebook.com/jacobs.quillermo>.

Despite the ease of generating fake pictures, on at least one occasion the network featured two admins with the *same* AI-generated picture.



Profile pictures for “Jacobs Guillermo” and his identical twin “Duncan Gilbert.”²⁵

Note that in some cases, female profile pictures were attached to male names, and vice versa (perhaps a marker of progressive views in fake profiles, perhaps an error from the operators).



Profiles for “[Dillinger Johnny](#)”²⁶ and “[Davidson Susan](#).”²⁷

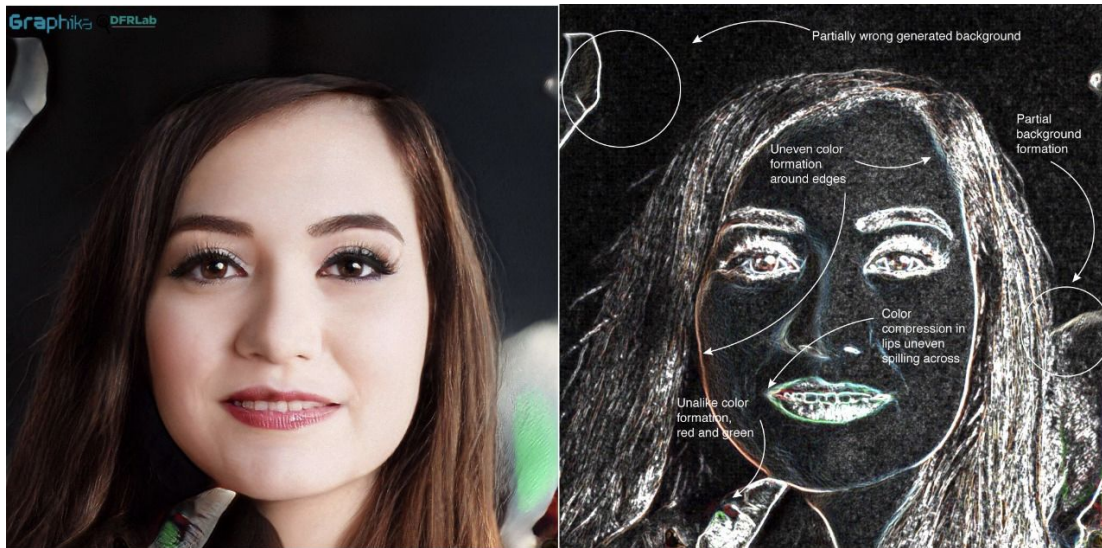
Other forms of analysis can help open-source researchers determine whether an image has been generated by an AI classifier. For instance, in the case of Mary Keen, illustrated above, it was possible to identify uneven color compression and a partially formed background using Error Level Analysis (ELA), a forensics technique often used to detect manipulation in images. ELA works by identifying the different compression levels in an image.²⁸

²⁵ <https://www.facebook.com/duncan.gilbert.568>

²⁶ <https://www.facebook.com/dillinger.johnny.9>

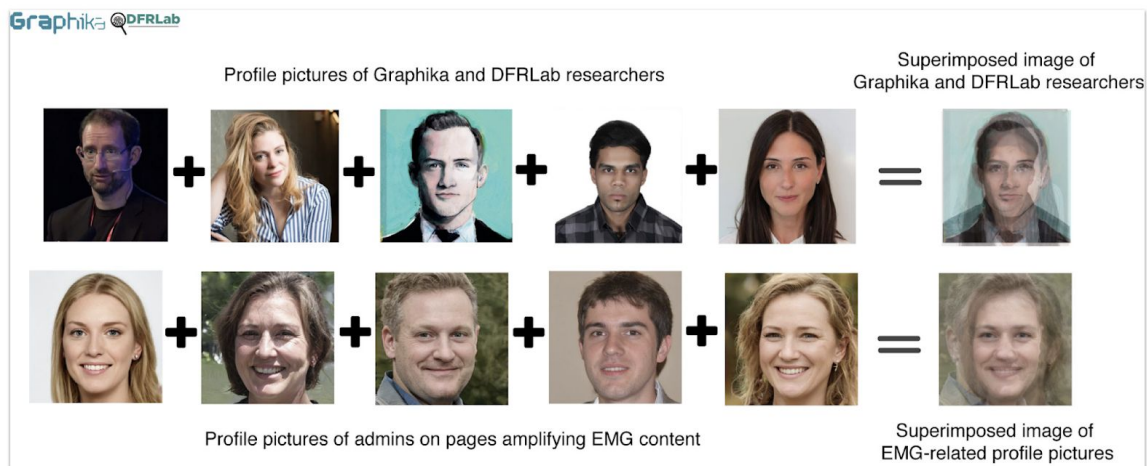
²⁷ <https://www.facebook.com/davidson.susan.1>

²⁸See: https://en.wikipedia.org/wiki/Error_level_analysis



Error Level Analysis for the "Mary Keen" profile picture.

One noteworthy feature of such profile pictures, exposed by open-source analyst [@conspirator0](#)²⁹ and further examined by authenticity analyst Sarah Thompson of [leadstories.com](#),³⁰ who both independently analyzed TheBL Facebook groups and came to the same conclusion, is that the eyes of all the profile pictures occur in the same place, regardless of the orientation of the computer-generated face. When the faces are superimposed, the eyeballs match - unlike with real profile pictures, which show greater variation. The authors of this report tried a small-scale experiment, comparing the profiles of five of the research team with five of the fake profile pictures.

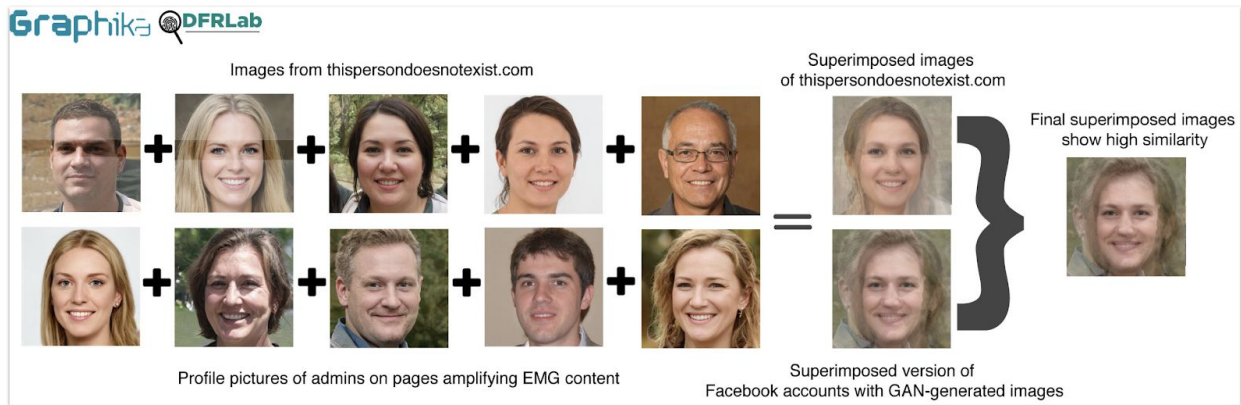


Comparison of the research team's faces (top row) with the AI-generated faces (bottom row).

²⁹ <https://twitter.com/conspirator0/status/1096877542521344002/photo/1>.

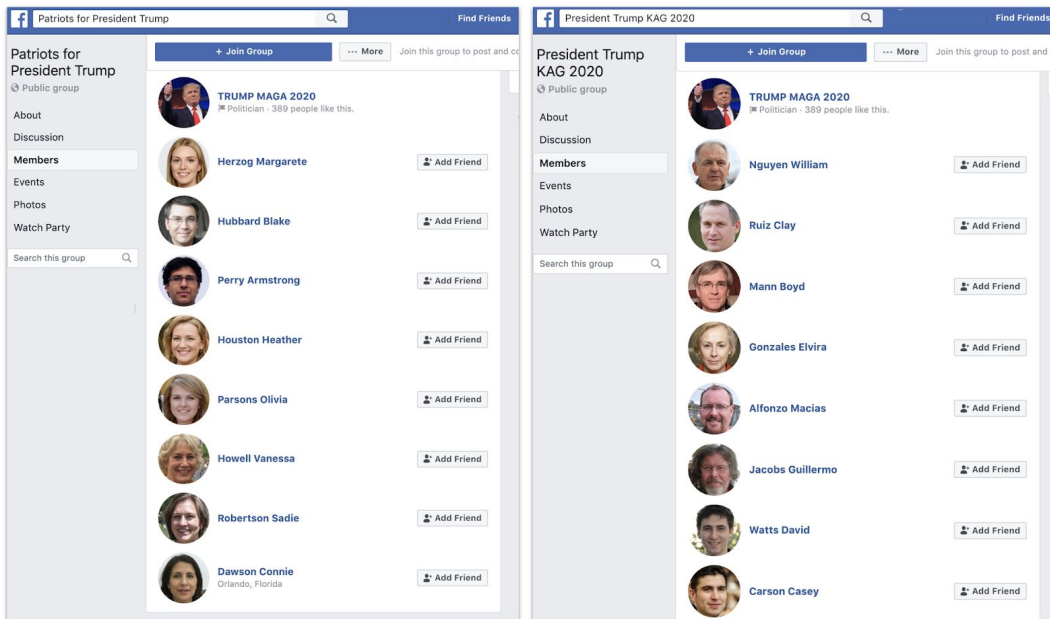
³⁰ Sarah Thompson, "Fake Faces: People Who Do Not Exist Invade Facebook To Influence 2020 Elections," [leadstories\[.\]com](#), December 12, 2019, <https://analysis.leadstories.com/3471185-fake-faces-people-who-do-not-exist-invade-facebook-to-influence-2020-elections.html>.

The authors then compared the pictures of the fake profiles with five AI-generated images taken from thispersondoesnotexist[.]com. This time, the eyeballs aligned precisely, even when all 10 images were superimposed on one another.



Comparison of the two sets of AI-generated images.

These fake admins formed the administrative backbone of these groups, often making up more than half of all the admins.



Admins on "[Patriots for President Trump](https://www.facebook.com/groups/839685489742960/)"³¹ and "[President Trump KAG 2020](https://www.facebook.com/groups/450880889092181/)"³² On the former group, 9 of 15 admins used AI-generated faces. On the latter, 8 of 16 did.

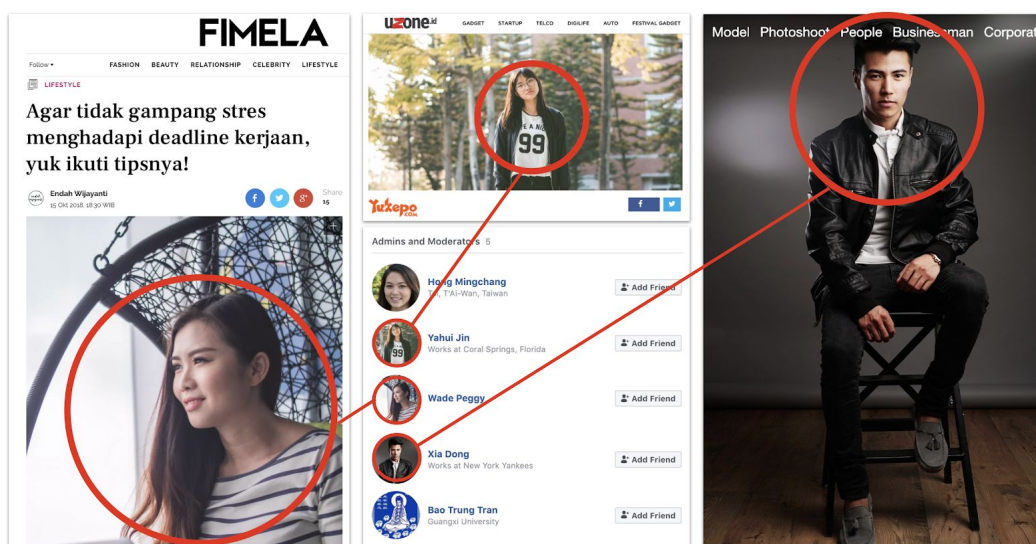
³¹ <https://www.facebook.com/groups/839685489742960/admins/>.

³² <https://www.facebook.com/groups/450880889092181/admins/>.

The ease with which the operation managed to generate so many synthetic pictures, in order to give its fake accounts (mostly) convincing faces, is a concern. Further research is needed to find ways to identify AI-generated profile pictures reliably and at scale, so that platforms and researchers can automate their detection.

Stolen pictures and accounts

AI-generated faces were the most innovative forms of fake account in this network, but they were by no means the only type. Some accounts used the more traditional method of taking their profile pictures from stock photos and glamor shots across the web. For example, one [group](#) that Facebook identified as belonging to this network, “#台灣政治新聞 Taiwan political news,”³³ featured five admins. One’s profile picture appeared to be machine-generated; [three of the others](#)³⁴ had profile pictures [taken from elsewhere](#) online, including a “photoshoot businessman corporate.”³⁵



The admins for the “Taiwan Political News” group, showing the profile pictures of three members of the team, and earlier websites featuring the same pictures. These are the [Yahui Jin](#),³⁶ [Xia Dong](#),³⁷ and [Wade Peggy](#)³⁸ mentioned in the network map on page 5, above.

³³ <https://www.facebook.com/groups/1287048571474181>.

³⁴ “Xia Dong”: <https://www.facebook.com/thihongtham.pham.10>; “Wade Peggy”: <https://www.facebook.com/profile.php?id=100040268111460>; “Yahui Jin”: <https://www.facebook.com/profile.php?id=100040395064377>.

³⁵ “Xia Dong”: <https://www.maxpixels.net/Photoshoot-People-Businessman-Corporate-Model-2911325>; “Wade Peggy”:

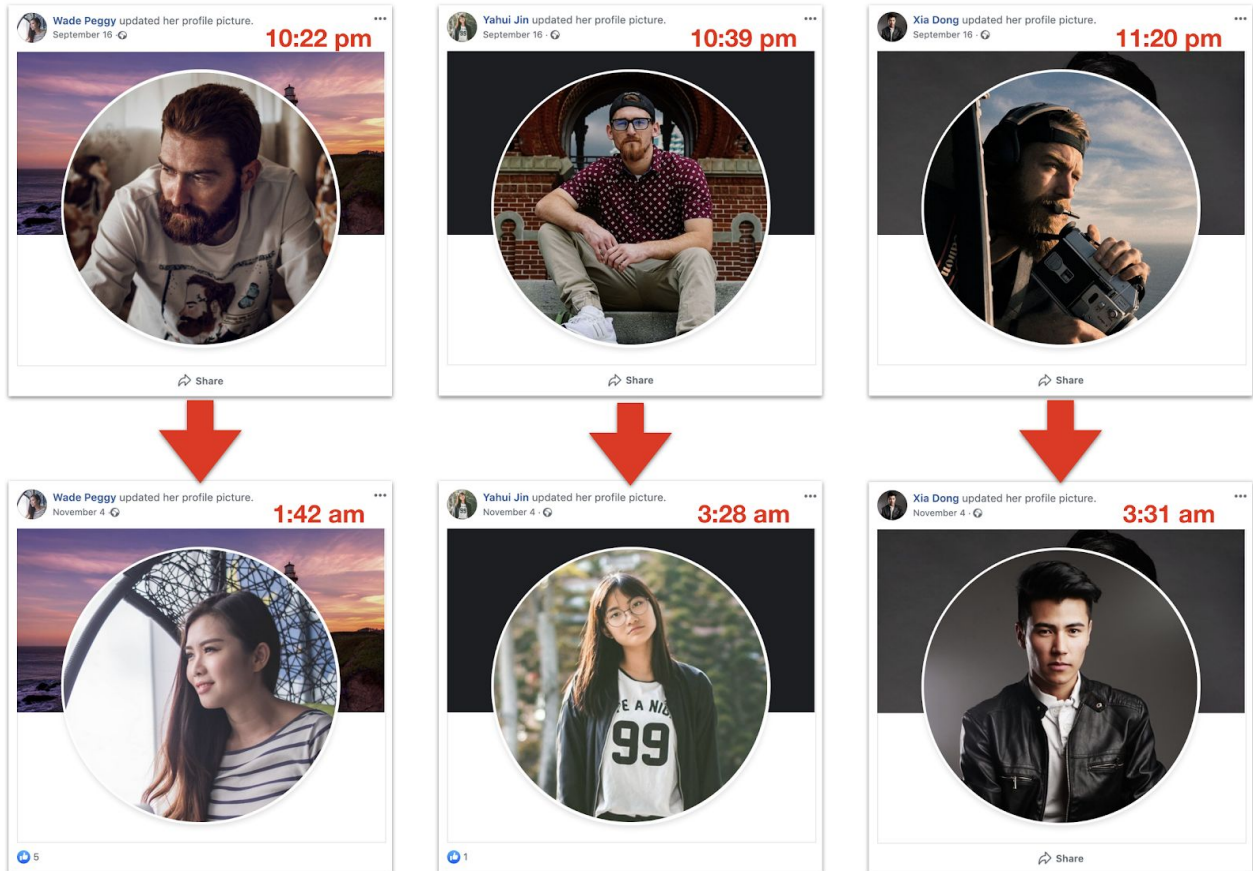
<https://www.fimela.com/lifestyle-relationship/read/3668025/agar-tidak-gampang-stres-menghadapi-deadline-kerjaan-yuk-ikuti-tipsnya>; “Yahui Jin”: <https://lifestyle.uzone.id/sebuah-renungan-pentingnya-berdamai-dengan-diri-sendiri-ketika-dunia-tidak-berpihak-padamu>.

³⁶ <https://www.facebook.com/profile.php?id=100040395064377>.

³⁷ <https://www.facebook.com/thihongtham.pham.10>.

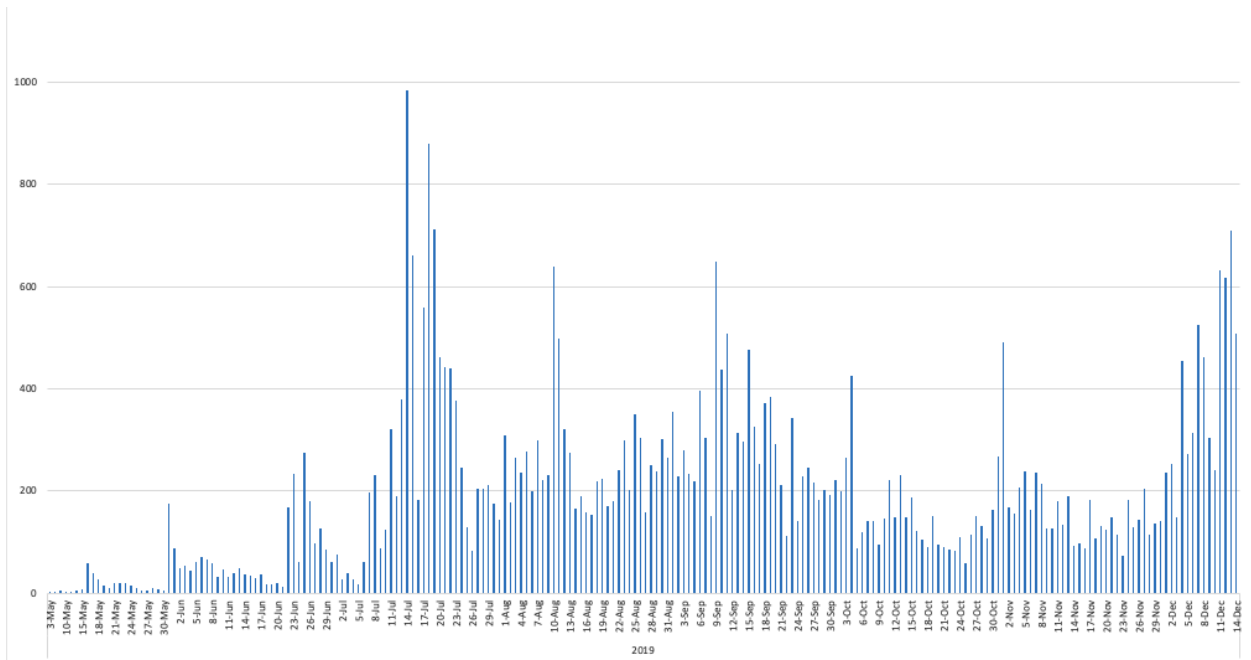
³⁸ <https://www.facebook.com/profile.php?id=100040268111460>.

Adding to the evidence that these accounts were indeed fake, the same three accounts all originally featured profile pictures of bearded white men: these were all uploaded on September 16, 2019, all in a period of less than an hour. They then changed to their current profile pictures on November 4, 2019, in less than a two-hour period.



The same admins for the Taiwan Political News group, showing the original profile picture uploads on September 16, 2019, and the replacements on November 4.

Joining in bursts

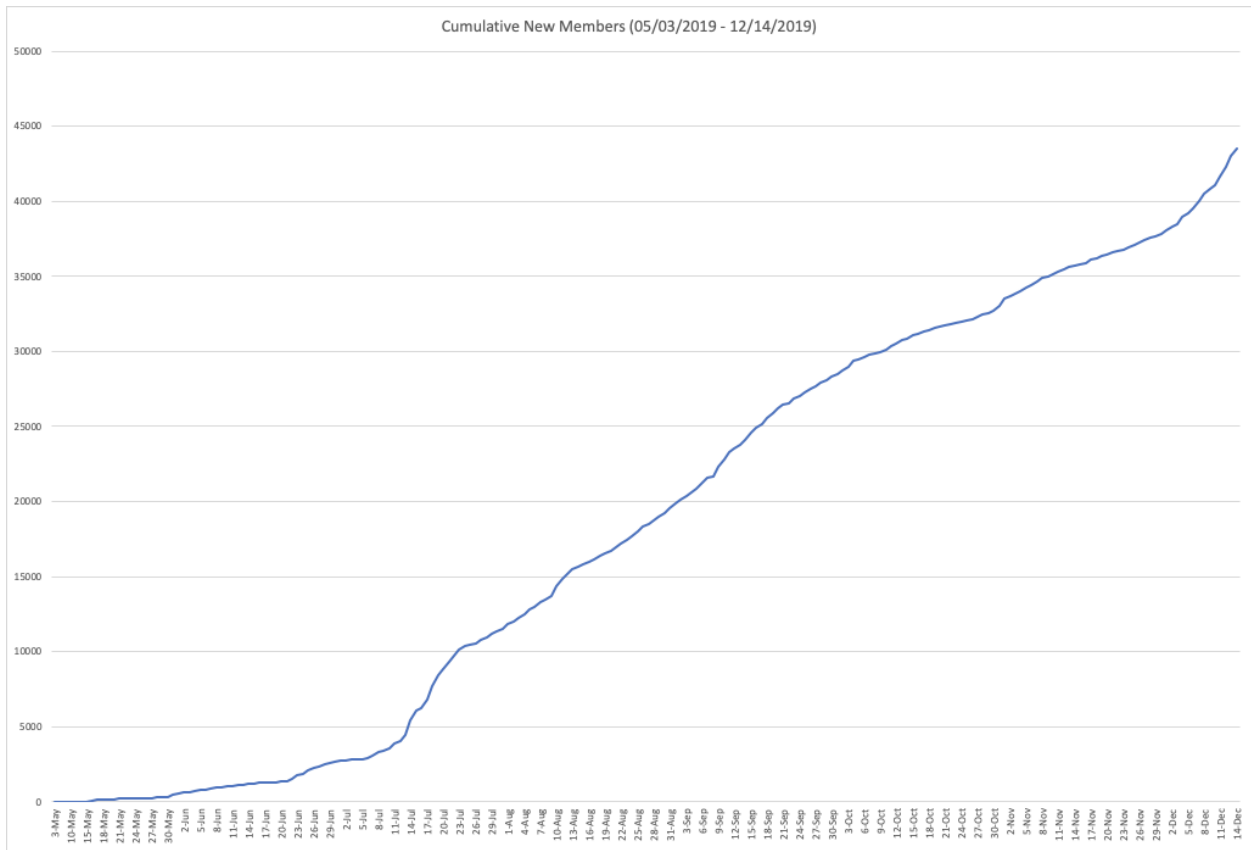


Example of accounts joining groups in batches, marked by day, from May 1, 2019 to December 14, 2019.

The example accounts detailed above all joined as part of a much larger batch of accounts. The Facebook process for joining a group entails an approval by an admin, and an “approve all” option is available, so there is a reasonable explanation for the pattern. Some days saw very high numbers of accounts joining, however, even though another batch had joined recently. This may suggest a sudden surge in organic interest, but given the number of fake accounts across the network, it may also indicate batches of fake accounts joining the groups.

Another pattern within the data showed that many of these batches were made very early in the morning, US Eastern time: between 2 am and 4 am. This would correspond to regular working hours for admins located in Vietnam or Taiwan, 12 hours ahead of the East Coast of the United States.

The scale of these bursts of new members led to a huge increase in the groups’ membership. The following graph illustrates the cumulative membership numbers from just one group, “[Stand With President Trump 2020](#),” from May until December 2019. On more than 30 different days, over 200 new members joined in a single day; on the busiest day of all, the group gained 1,000 new members. The uptick started in July and then continued at a slightly lower but still very inflated rate after that.



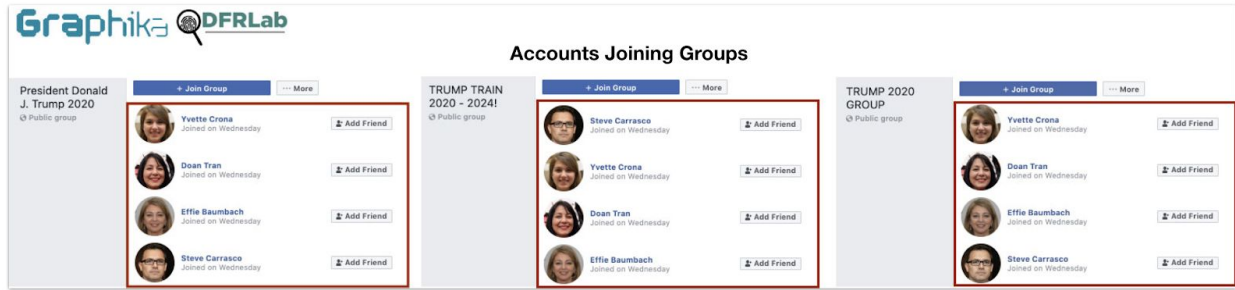
Total new members gained by "Stand With President Trump 2020" from May to December.

Industrial and automated

The way that the three apparently Asian accounts Yahui Jin, Xia Dong, and Wade Peggy uploaded their first profile pictures within an hour of each other was not an isolated incident. On several occasions, the authors of this report found accounts that followed similar behavior patterns, joining the same groups at the same time, or uploading their profile pictures within very short timespans.³⁹

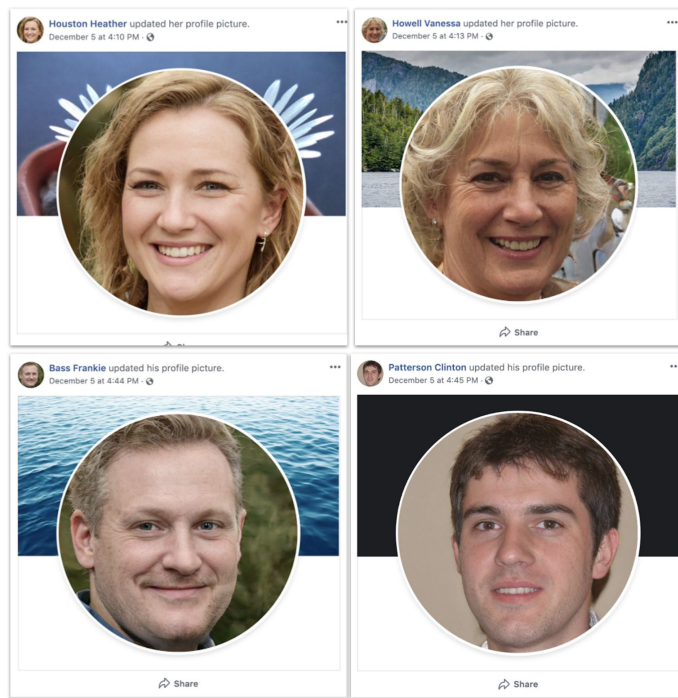
On some occasions, multiple accounts with AI-generated faces joined the same groups at the same time and almost in the same order.

³⁹ Facebook does not show the date on which accounts were created: the upload date of the first profile picture is a useful proxy that can at least indicate the beginning of activity by the account.



Multiple AI-generated image accounts joined the same groups on the same day.

On other occasions, the admins of specific groups uploaded their AI-generated profile pictures on the same day, only a few minutes apart, suggesting that the accounts were created and stocked with profile pictures in a batch. Many of them used Facebook’s suggested stock cover images as a background.



Profile uploads for “Houston Heather,”⁴⁰ “Howell Vanessa,”⁴¹ “Bass Frankie,”⁴² and “Patterson Clinton”⁴³ all admins of the group “Patriots for President Trump.”⁴⁴ Note the upload times between 4:10 and 4:45 pm on December 5, 2019. “Bass” and “Patterson” were suspended before December 17, 2019.

⁴⁰ <https://www.facebook.com/houston.heather.5>.
⁴¹ <https://www.facebook.com/howell.vanessa.3>.
⁴² <https://www.facebook.com/bass.frankie>.
⁴³ <https://www.facebook.com/patterson.clinton.5>.
⁴⁴ <https://www.facebook.com/groups/839685489742960>.

Other admin accounts also appear to have been created in batches. These did not have AI-generated faces or, indeed, any faces at all: they featured flowers and nature scenes as their profiles and Facebook's stock images for their cover photos.



Profile uploads for "[Nancy Myers](#),"⁴⁵ "[Shei Shei](#),"⁴⁶ and "[Maya Sharma](#),"⁴⁷ all on December 10, 2019, between 2:02 pm and 4:21 pm, and all admins on groups that boosted *TheBL* in particular.

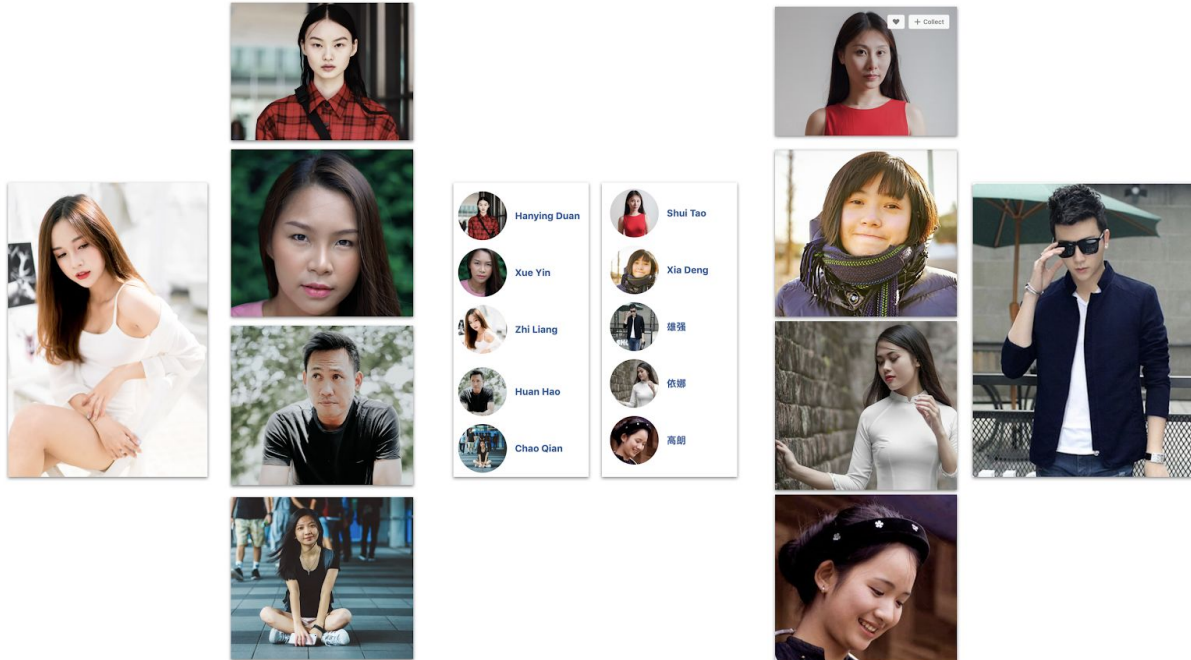
The same behavior featured on pro-Trump groups in America and Chinese-language groups that focused on "daily news" in China, Hong Kong, and Taiwan. One Chinese-language group identified by Facebook, "[每日新聞@](#)" ("Daily News @," according to Google Translate),⁴⁸ featured 10 admins. All of them had profile pictures taken from elsewhere online.

⁴⁵ <https://www.facebook.com/nancy.myers.182940>.

⁴⁶ <https://www.facebook.com/shei.shei.129794>.

⁴⁷ <https://www.facebook.com/profile.php?id=100044750432520>.

⁴⁸ <https://www.facebook.com/groups/1090051461359736/>.



The profile pictures and their originals. Left-hand column of profiles, top to bottom: unsplash.com,⁴⁹ unsplash.com,⁵⁰ unsplash.com,⁵¹ jewelry4man.com,⁵² unsplash.com,⁵³; right-hand side, top to bottom: unsplash.com,⁵⁴ pxhere.com,⁵⁵ Vietnamese fashion outlet thoitrangtichtac.com,⁵⁶ a [Pinterest post](#) on Vietnamese “ao dai” dresses,⁵⁷ and Vietnamese website tienphong.vn.⁵⁸

⁴⁹ <https://unsplash.com/photos/5pPxsuAbYVY>; account.

⁵⁰ <https://unsplash.com/photos/U4JDjYmjn1g>; account <https://www.facebook.com/xue.yin.7946>.

⁵¹ https://unsplash.com/photos/aXDj_NiS05o; account <https://www.facebook.com/zhi.liang.9699>.

⁵² <https://jewelry4man.com/a-man-guide-to-wearing-a-bracelet/>, account

<https://www.facebook.com/huan.hao.509>.

⁵³ <https://unsplash.com/photos/GBgp6ly16lc>; account.

⁵⁴ <https://unsplash.com/photos/H14pflfr24>; account

<https://www.facebook.com/photo.php?fbid=104806857606212>.

⁵⁵ <https://pxhere.com/fr/photo/656877>; account

<https://www.facebook.com/photo.php?fbid=118460482897566>.

⁵⁶

<https://www.thoitrangtichtac.com/thoi-trang-nam/ao-khoac-nam/14188-ao-khoac-kaki-nam-gia-vest-mau-xanh-den-b4188.html>; account <https://www.facebook.com/photo.php?fbid=100334014613058>.

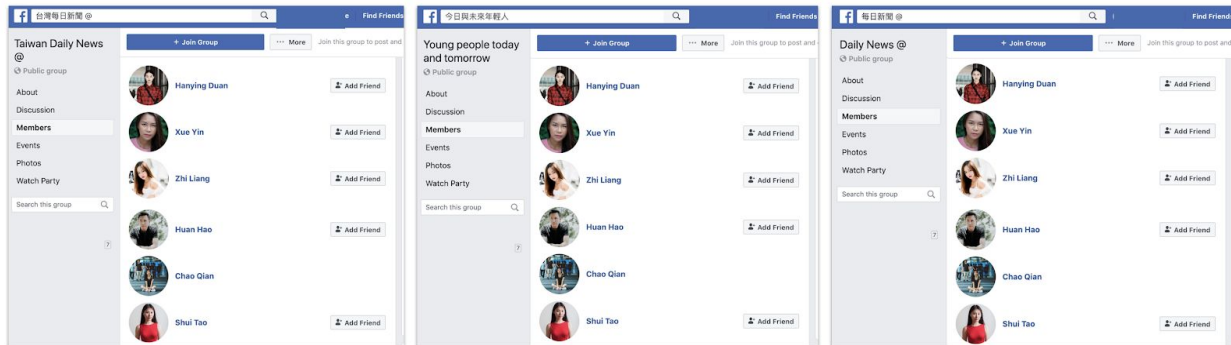
⁵⁷ <https://www.pinterest.co.uk/pin/524669425333567196/>; account

<https://www.facebook.com/hanh.nga.146612>.

⁵⁸

https://www.tienphong.vn/suc-khoe/cong-dung-ngon-hanh-cua-vo-keo-chong-ngoai-tinh-tro-ve-700835.tp_o; account <https://www.facebook.com/profile.php?id=100038797278619>.

As the network map on page 13 demonstrates, the same accounts administered three other groups whose names translate as “[Young People Today and Tomorrow](#),”⁵⁹ “[Taiwan News](#),”⁶⁰ and “[Taiwan Daily News](#).”⁶¹



Admin lists for “Taiwan Daily News @,” “Young people today and tomorrow,” and “Daily News @,” showing the same admins with the same stolen profile pics, in the same order.

These accounts, too, appear to have been created in bursts, albeit further apart: three on July 4, 2019, between 2:34 and 3:04 am; three on October 14, spread out across the day; and four on November 15-16.

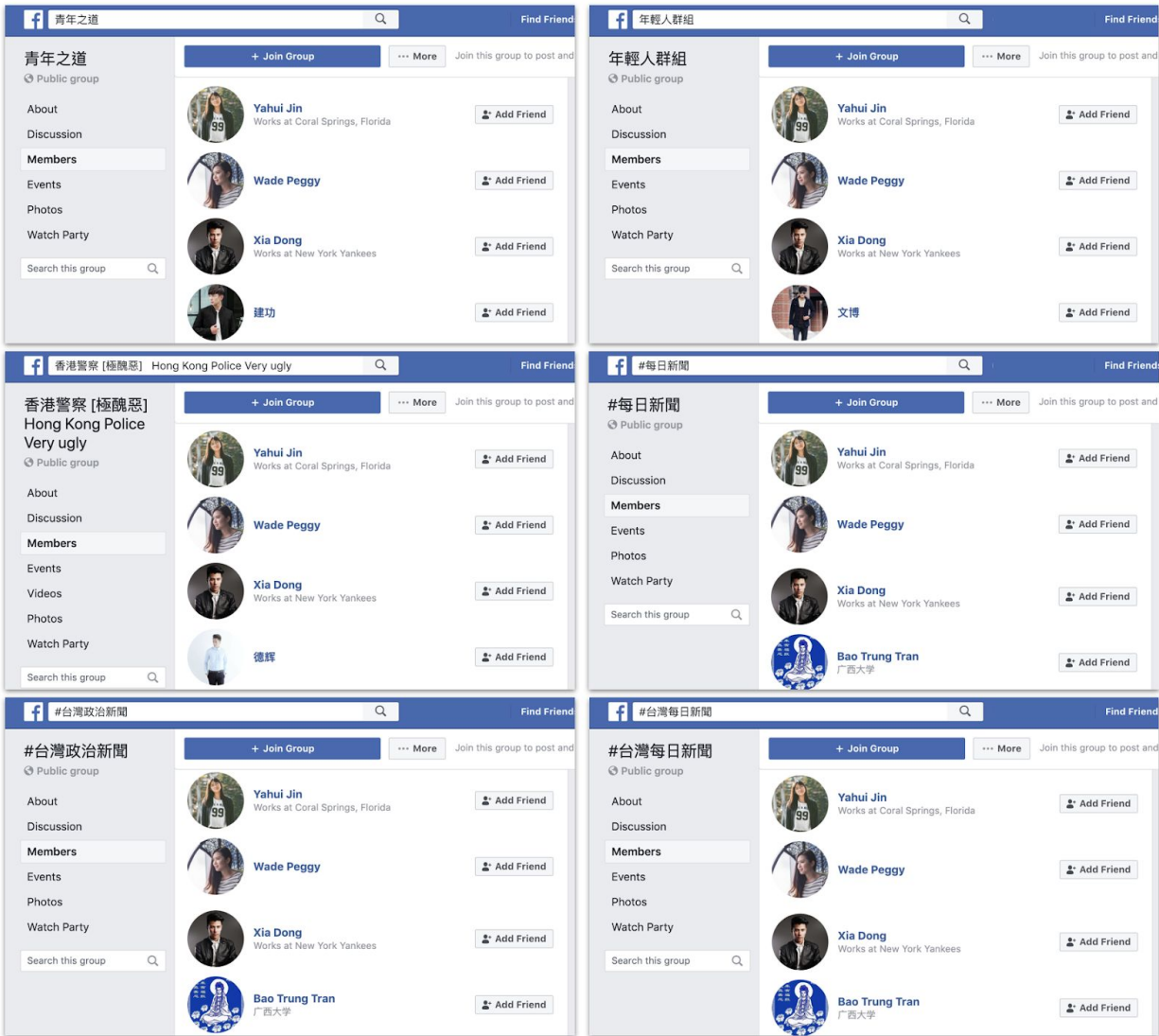
As we have seen, the Chinese-language accounts “Wade Peggy,” “Yahui Jin,” and “Xia Dong” also appear to have been created in a batch: [they administered at least seven different groups](#).⁶²

⁵⁹ <https://www.facebook.com/groups/2336026449858512/>.

⁶⁰ <https://www.facebook.com/groups/520705002012874/>.

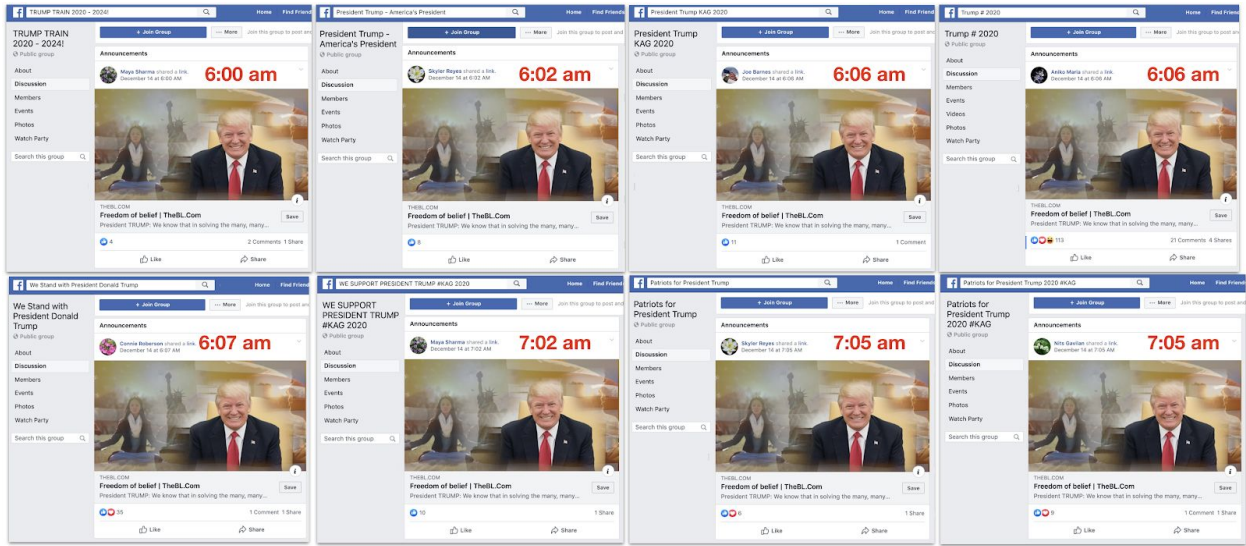
⁶¹ <https://www.facebook.com/groups/387103835311765/>.

⁶² <https://www.facebook.com/groups/426190564912141/admins/>;
<https://www.facebook.com/groups/2446995738679703/admins/>;
<https://www.facebook.com/groups/376878212988491/admins/>;
<https://www.facebook.com/groups/899453053769505/members/>;
<https://www.facebook.com/groups/1287048571474181/members/>;
<https://www.facebook.com/groups/2449674968643963/members/>;
<https://www.facebook.com/groups/394974761398565/members/>.



The same admins across six groups.

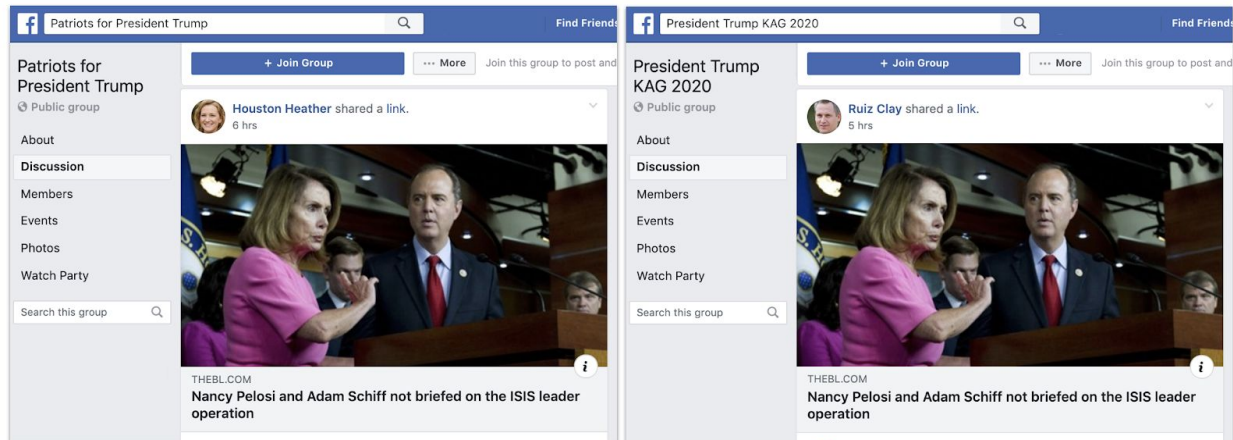
The batch behavior of such admin accounts was not limited to joining and managing groups: the admin accounts also *posted* in batches, spreading the same content across multiple groups in short order. Almost invariably, the posts they shared came from TheBL[.]com or one of its offshoots. On many occasions, different fake accounts posted the same link to different groups in a production chain of fake amplification.



The same post from TheBL[.]com, shared by different admins to different groups between 6:00 am and 7:05 am on December 14, 2019. Note the admins include “Maya Sharma” and “Skyler Reyes,” described above.



The same post from BLDaily[.]com, shared to two different groups by one fake admin, both posted within 15 minutes of each other.



Shares of the same article from TheBL[.]com by two different fake accounts with AI-generated faces to the same two groups noted above.

This network appears to engage in a large-scale case of coordinated inauthentic behavior, with fake accounts being created in batches, assigned to administer groups and pages in batches, and posting content to those groups in batches - with the end effect of primarily boosting TheBL online footprint.

Automated posting

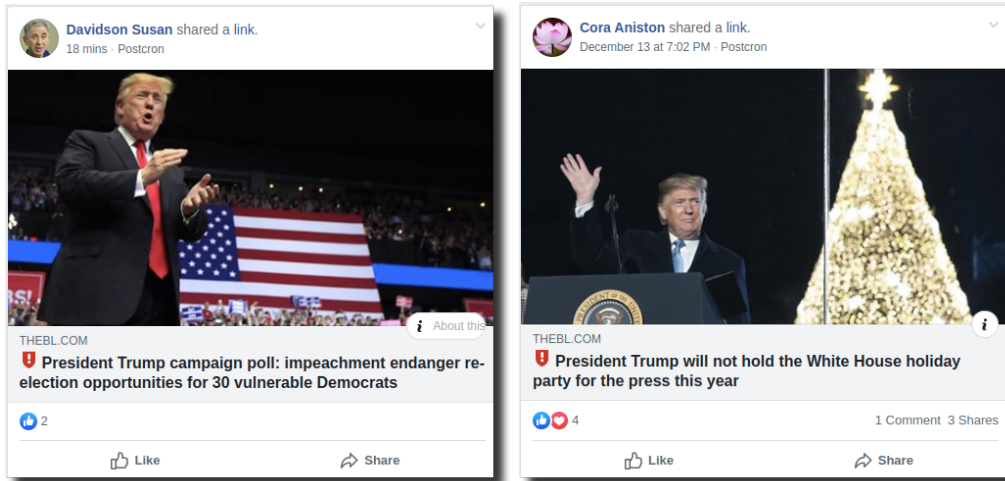
Some of this batch behavior can be explained by automated posting tools: in several of the US-focused groups, the admins used an automation service called postcron.com.⁶³ This website offers users the ability to “Post up to 1,000 posts, pins, or tweet at once from an Excel or Google Docs file.”

The service works across platforms, automating Instagram, Facebook, Twitter, Pinterest, and YouTube. It offers plans ranging from a single person automating up to 10 accounts across platforms to a plan allowing for control of 140 accounts by up to 15 team members. TheBL also uses it to automate both of its Twitter accounts, @TheBLNews and @TheBLcom, though their engagement on Twitter is much lower than that seen on Facebook. The highest tier service allows for up to 3,000 scheduled posts.

The service allows both group and page management, though there appear to be some limitations in using it with multiple groups and pages, noting on their site, “*Note: Due to Facebook Policies, you can only add the Facebook groups that are connected with the Postcron's app.”⁶⁴ The precise meaning of this is unclear, but the implication is that there are limitations to a client’s ability to cross-post across groups. The accounts seen using Postcron for their posts were admins of the group in which it was posting, though not all admins appear to have posted via the app. All of the posts observed that were marked as having been posted using Postcron came from individual accounts, rather than other pages.

⁶³ <https://postcron.com/en/>.

⁶⁴ <https://postcron.com/en/pricing>.

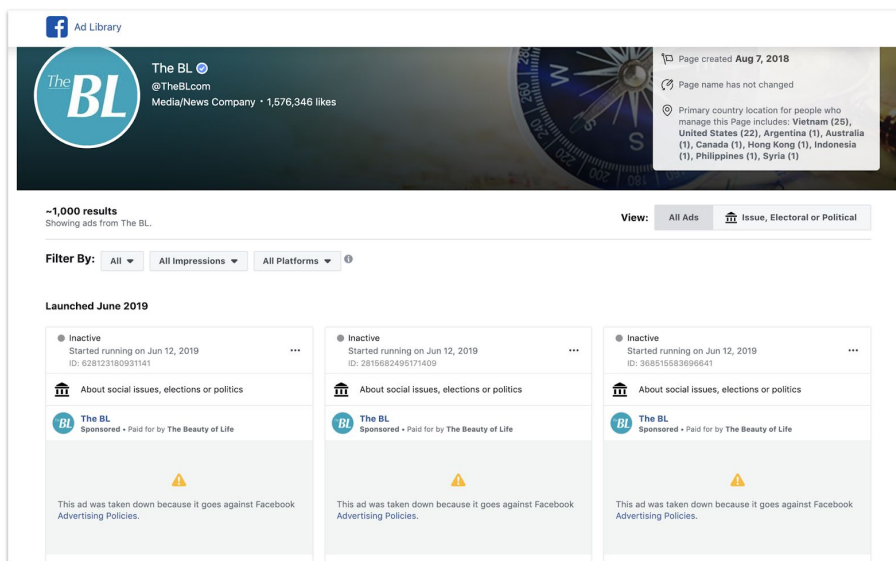


Links to theBL[.]com made via Postcron to different groups.

Automation is not in itself a violation of terms of service, although the very high numbers that Postcron advertises (up to 1,000 posts) appear likely to run the risk of qualifying as spam. The Postcron feature across Facebook and Twitter is interesting for the light it shines on how this operation worked.

Advertising clusters

Some of TheBL Facebook assets advertised extensively; according to Facebook, total ad spend across the banned accounts amounted to less than \$9.5 million. According to Facebook’s ad library, by far the most active advertiser was TheBL.com, which posted around 1,000 ads in its lifetime, although many were removed for violating Facebook’s ad policies.



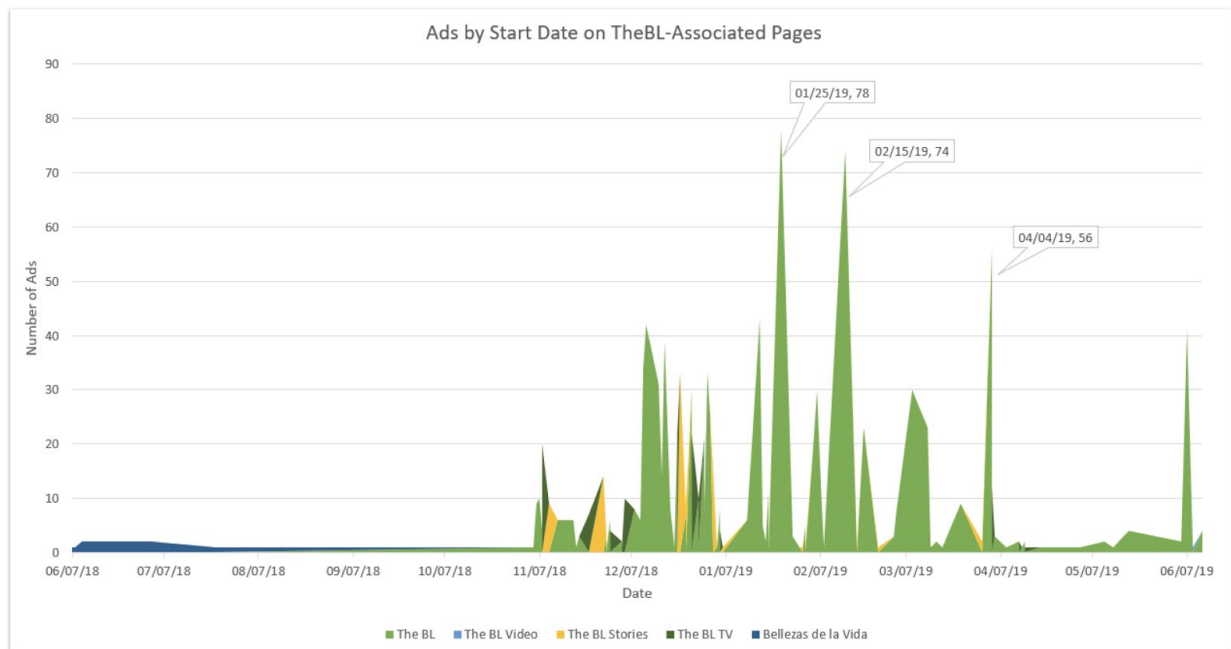
Ad library entry for TheBL. Note the removed ads.

The ads were not spread out evenly across the year: they came in bursts, with dozens of very similar ads running on the same day, perhaps as a form of A/B testing to see which would work best.



Three ads run by TheBLcom on June 7, 2019. The page ran 43 ads that day, 56 ads on April 4, 74 on February 15, and 78 on January 25.

This pattern of silence followed by sudden bursts of intense activity was repeated across the network, though none of the other assets was as active as TheBLcom.



Graph showing the distribution of ads from June 2018 through June 2019.

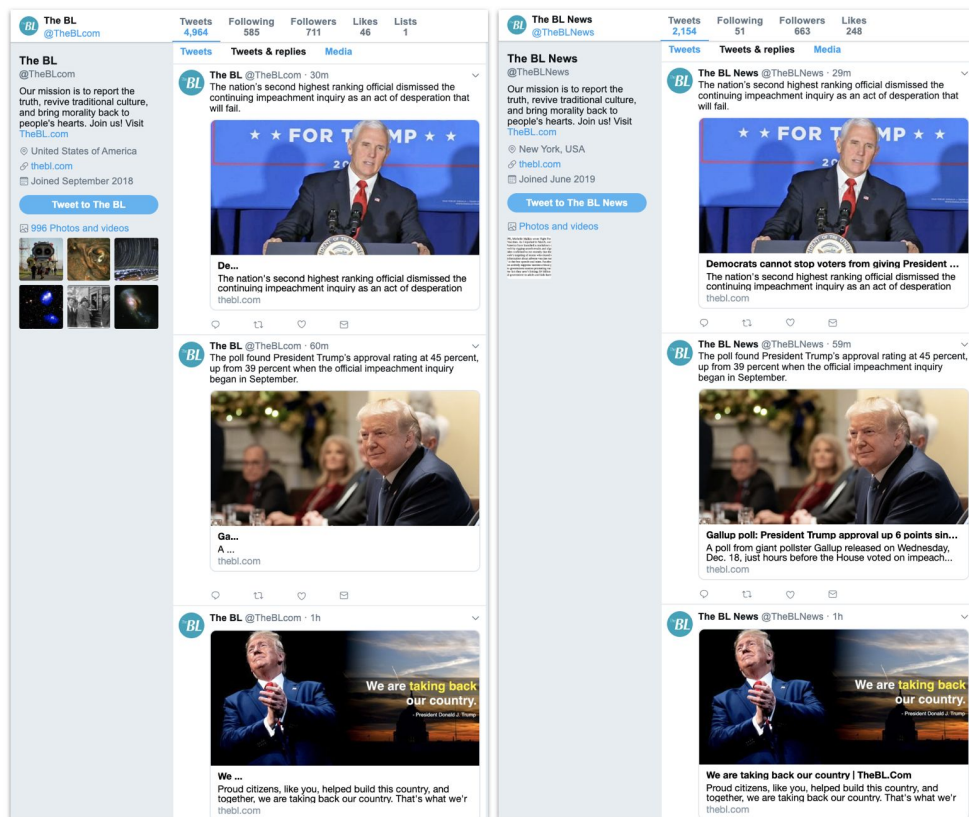
The overall ad spend was substantial, although Facebook pointed out that it “includes the entirety of advertising activity by both inauthentic and authentic accounts removed as part of this network

engaged in coordinated inauthentic behavior.” Hitherto, the highest ad spending that featured in a Facebook takedown was [\\$1.6 million](#).⁶⁵

Twitter and YouTube

TheBL was less active and successful on Twitter. As of December 19, 2019, one of its official accounts, @TheBLcom, which joined in September 2018, only had 711 followers. @TheBLNews, which joined in June 2019, had 664 followers.

As of December 19, 2019, neither account showed high numbers of retweets: typical posts received no engagement at all, and a few scored in the range of 1-3 likes and/or retweets.. All the most recent posts as of that date were automatic shares from TheBL[.]com, showing the same stories in the same order on both accounts.

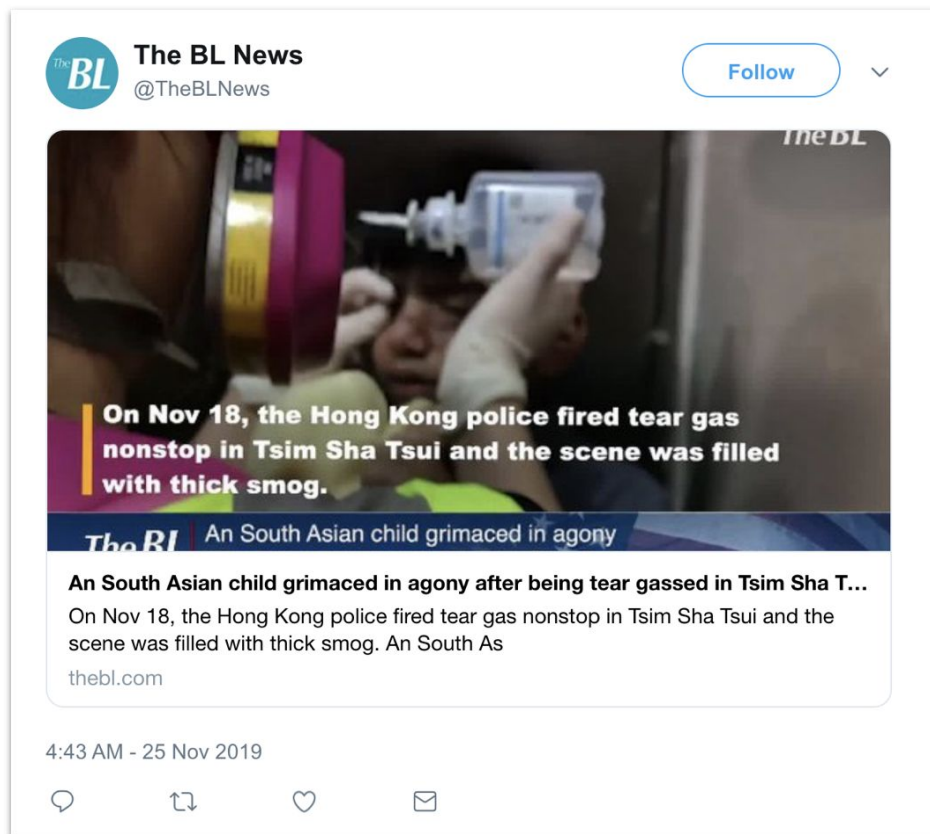


Timelines of @TheBLcom and @TheBLNews as of December 19, 2019, showing the same posts in the same order.

⁶⁵ Nathaniel Gleicher, “Removing Coordinated Inauthentic Behavior From Iraq and Ukraine,” Facebook newsroom, September 16, 2019, <https://about.fb.com/news/2019/09/removing-coordinated-inauthentic-behavior-from-iraq-and-ukraine/>.

However, some tweets scored retweets on the day they were posted from Twitter accounts that were later suspended for violating Twitter's terms of service in some way, most likely spam activity.

For example, on November 25, @TheBLNews [tweeted](#) a short link to a video article on TheBL.com.⁶⁶ The shortened link read <https://t.co/HTXoBQnJJo>. As of December 19, 2019, the tweet did not show any retweets or likes.



The tweet by @TheBLNews. Note the lack of reactions.

The December 19 figure did not take into account the fact that the tweet had initially been retweeted nine times, but every single account that retweeted it had later been suspended on an unknown date.

Similarly, a [tweet](#) on November 13 concerned the whistleblower who first reported President Trump's controversial call with the Ukrainian president, a report that launched the process leading to the US president's impeachment.⁶⁷ As of December 19, this tweet showed six retweets, but on the day it was posted, accounts that have since been suspended gave it eight more.

⁶⁶ <https://twitter.com/TheBLNews/status/1198824412822290432>. The link resolves to <https://thebl.com/video/an-south-asian-child-grimaced-in-agony-after-being-tear-gassed-in-tsim-sha-tsui/>.

⁶⁷ <https://twitter.com/TheBLNews/status/1194410850813186048>.

The same pattern occurred on @TheBLcom. For example, on November 24, a [tweet](#) from this account shared an article on TheBL[.]com that was, in turn, about a tweet by President Trump. As of December 19, the tweet showed just one like and no retweets; however, on the day it was tweeted, it scored 10 retweets from other accounts, all since suspended.



Tweet from @TheBLcom, showing its last lonely like.

These incidents were smaller in scale than the activity on Facebook: Sysomos registered just under 2,000 mentions of @TheBLNews between December 2018 and December 2019 and 1,230 mentions of @TheBLcom. That the accounts have already been suspended limits the evidence available to assess the scale of the activity. It is clear, however, that the amplification of both accounts benefited from a substantial proportion of engagement from fake accounts, when compared with the engagement from real ones.

On YouTube, TheBL showed little presence, but the little that it showed exhibited an unusual feature that may indicate inauthentic amplification on that platform, too. The namesake channel, created on April 18, 2019, featured just three videos and had 51 subscribers as of December 19, 2019.⁶⁸

The image displays two screenshots of the YouTube channel 'The BL'. The top screenshot shows the 'ABOUT' tab, which includes the channel name 'The BL' with 51 subscribers, a search icon, and a 'Stats' section. The stats section lists 'Joined Apr 18, 2019' and '1,819,248 views'. The bottom screenshot shows the 'VIDEOS' tab, featuring three video uploads. The first video is 'Get Free Real News' with 1.8M views and uploaded 5 months ago. The other two videos are 'TheBL.com - Breaking News', each with 3.2K views and uploaded 6 months ago.

"About" details and videos from TheBL on YouTube.

Two of the videos promoted TheBL's video content,⁶⁹ promising to "highlight the positive" and provide "honest coverage of President Donald Trump and the achievements of the Trump administration which are not reported by the mainstream media." These were both uploaded on June 16, 2019, and scored 3,259 views and 3,305 views, respectively.

A third video was uploaded on July 13, 2019. Headlined "Get Real Free News," it featured a White House video of Trump insulting journalists.⁷⁰ It generated six replies, 15 reactions, and over 1.8 million views.

⁶⁸ <https://www.youtube.com/channel/UCxeRM7W8zt873p3flyVZAUw/>.

⁶⁹ <https://www.youtube.com/watch?v=OsJyKwHCix0> and https://www.youtube.com/watch?v=pcn1wjxvg_8.

⁷⁰ <https://www.youtube.com/watch?v=Dvs4WoQgLJ0>.



The most successful BL video, watermarked to the White House.

This disparity between the numbers of subscribers, reactions, and views is so stark that it raises the question of whether the video was artificially boosted in some way.

Ben Nimmo (Director of Investigations at Graphika, non-resident Senior Fellow at DFRLab) led this investigation, with teams at both Graphika and DFRLab: **C. Shawn Eib, L. Tamora, Kate Johnson, Ian Smith** from Graphika; **Esteban Ponce de León Rosas, Kanishk Karan, Eto Budziashvili, Alyssa Kann, Max Rizzuto** from DFRLab. **Camille François** and **Iain Robertson** served as Editors.

The authors also thank **Sam Gregory** at Witness, and **Luisa Verdoliva** and **Francesco Marra** at University Federico II of Naples for their kind help in analyzing the AI-generated pictures in this set.

