Computational
Propaganda
Research Project

Computational Propaganda in Taiwan: Where Digital Democracy Meets Automated Autocracy

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Abstract

Taiwan is a country with a rich history and cultural ties to mainland China. Though there has been much research and effort dedicated to propaganda and censorship in the People's Republic of China over the years, less attention has been paid to the digital propaganda sphere in Taiwan. This report explores computational propaganda in Taiwan and finds that digital propaganda in Taiwan can be divided into two types: (1) internal propaganda on domestic political issues and campaigns and (2) cross-Strait propaganda—emanating from the mainland and promoting reunification of the two countries. Furthermore, recent computational and social research points to manual propaganda being the main method used in campaigns in both countries. The uses of two political bots in Taiwan, an anti-fake news bot and an intelligence-gathering crawler bot used in a 2014 electoral campaign, are explored in detail.

Introduction

Taiwan is one of Asia's greatest success stories. From its bloody authoritarian beginnings, it has grown into a robust, healthy democracy and one of Asia's least corrupt and most free societies (Freedom House, 2017; Transparency International, n.d.). A few facts quickly illustrate this—within South East Asia, only Singapore, Bhutan, Japan and Hong Kong scored higher than Taiwan on Transparency International's Corruption Perceptions Index 2016. Similarly, in April 2017, Reporters Without Borders announced Taiwan as the location of its headquarters in Asia—RSF Secretary General Christophe Deloire noted, "The choice of Taiwan was made […] considering its status of being the freest place in Asia in our annual Press Freedom Index ranking" ("Reporters Without Borders," 2017) .

Taiwan's future, however, is both bright and precarious. Whether Taiwan will be allowed to continue on its current progressive path and eventually gain full diplomatic recognition as a country in its own right depends in large part on a number of unpredictable factors, including tensions with its neighbor across the Taiwan Strait—mainland China—and its relations with the United States of America. Taiwan's future, however, is a reliable bellwether for the future of the world. Whether societies will remain open to the international influence of liberal democracy or succumb to darker atavistic, authoritarian impulses is one of the most important questions of the current age, and Taiwan will be one of the main arenas in which this battle plays out. Taiwan is culturally, linguistically and increasingly economically linked to a growing authoritarian hegemon, mainland China, while being supported in funds, arms and ideology by the United States of America.

It is against this backdrop that we approach the digital sphere in Taiwan. The successful 2014 digital campaign of Ko Wen-je for mayor of Taipei, the capital of Taiwan, was a watershed in the nation's politics. Politicians can no longer ignore the central role of digital media in campaigning, messaging and mobilizing. A natural consequence of this is that the central questions of the republic—international issues such as the extent of Taiwan's strategic cooperation with the mainland, as well as issues of domestic concern—will ever increasingly be discussed and fought over in the digital sphere. The role of computational propaganda is therefore central to the nation's present and future.

In this working paper, references to "computational propaganda" will assume the definition provided by Howard and Woolley (2016), namely "the assemblage of social media platforms, autonomous agents, and big data tasked with the manipulation of public opinion". There has been minimal work on computational propaganda in Taiwan, and no research has been able to conclusively point towards evidence of automation in this regard. Ko and Chen (2015) explored the possible existence of a small cyber army supporting the Kuomintang (KMT) candidate in the Taipei mayoral election of 2014, and King, Pan and Roberts (2017) recently shed light on the internal workings of mainland propaganda online.

This working paper will explore three main questions:

1. Is computational propaganda present in Taiwanese society?
2. What is the composition of computational propaganda in Taiwan (manual vs automated)?
3. Where are campaigns most likely to come from?

While few Taiwanese experts have carried out conclusive research on bot usage or have firm evidence about it, the ground is fertile for the use of automated propaganda. While one must still speculate on the existence of malicious political bots in Taiwan, manual computational propaganda is alive and thriving on the island. The existence of cyber armies—網軍 (wǎng jūn) in Chinese—has been covered in the Taiwanese media and formally explored in at least one academic paper (Ko & Chen, 2015). Social media campaigns from the mainland targeting

prominent Taiwanese figures have also been covered in the Taiwanese and international media.

When we were searching for evidence of bots and computational propaganda in Taiwan, two particular areas of interest emerged: (1) mainland campaigns—online agitprop with the intent to smear Taiwan's pro-independence figures and vaunt the mainland's superiority and (2) internal campaigns—propaganda launched with the intent to influence Taiwan's national politics. These campaigns could be on behalf of a party (such as the KMT, the Democratic Progressive Party (DPP) or the New Power Party (NPP)) or could be propagandizing for or against a given national political issue in Taiwan (such as legalizing gay marriage).

Case study

Taiwan's history and diplomatic status are labyrinthine in complexity. Be that as it may, a cursory understanding is necessary to understand where potential hotspots for computational propaganda may lie online.

This section will proceed in three parts:

> 1. First, we will examine relevant details of Taiwan's history and current media structure;
> 2. Next, we will proceed to an overview of computational propaganda in Taiwan, examining both Taiwan-internal and cross-Strait propaganda; and
> 3. Finally, we will conduct a thorough analysis of the 2016 Diba campaign on Tsai Ing-wen's Facebook page.

Media and social media landscape in Taiwan

Even with 1949 as a starting point, Taiwan is an island with an incredibly complex history. That year, General Chiang Kai-Shek defected to the island after being defeated by Mao Zedong and the communist army in the Chinese civil war, and the country has existed as a de facto independent nation ever since.

The rub lies in the words "de facto"—there is no more central issue to Taiwanese politics than the country's strange diplomatic quandary. The debate stems from the fact that, since 1949, both mainland China (whose formal name is the People's

Republic of China (PRC)) and Taiwan (the Republic of China) have claimed to be the one true China, each claiming dominion over the other. This predicament has undergone various official incarnations in the one-China policy and the two nations' 1992 Consensus—which states that the two states recognize that there is only one China, but disagree about what that means. *The Economist* has aptly characterized this history as "not so much fraught with ambiguities as composed of them" ("The great obfuscation of one-China," 2017). Taiwan currently only maintains official diplomatic ties with 21 countries, a number that has steadily dwindled as the mainland's wealth and global influence has grown (Huang & Steger, 2016).

However, there are stark differences in the two countries that stand out to any observer—in governance, daily life and media. Freedom House's 2017 *Freedom in the World* report drove the point home—in this most recent report, mainland China scored lower than Iran, and Taiwan garnered a rating higher than the United States.

In addition to changes in international affairs, domestic politics in Taiwan has also undergone significant change in the past three years. In 2014, the Sunflower Movement, a series of largely student-organized protests, successfully derailed a bill to establish closer financial ties between Taiwan and the mainland (Ramzy, 2014). A new left-wing party, the New Power Party (NPP/時代力量) emerged from this movement, and even won five seats in the Taiwanese Legislative Yuan in 2016 (van der Horst, 2016). Historically, Taiwan has predominantly been ruled by the Chinese Nationalist Party (KMT/國民黨). In January 2016, the country elected its second president from the pro-independence Democratic Progressive Party (DPP/民進黨), and its first female president, Tsai Ing-wen (蔡英文) (Hsu, 2016).

This is the context behind the political digital sphere in Taiwan. Given Taiwan's history and mainland China's prolific expertise in propaganda, two vectors are of particular interest for computational propaganda research:

> 1. Taiwan-internal campaigns—propaganda campaigns for domestic political issues;
> 2. Cross-Strait campaigns—propaganda campaigns targeting high-profile Taiwanese politicians from the mainland and/or promoting unification of China and Taiwan.

In relation to the latter, mainland China has a twofold interest in Taiwan—promoting pro-unification politicians (most of whom belong to the KMT) and smearing pro-independence politicians (who belong to the DPP or the NPP). President Tsai Ing-wen, Taipei's mayor, Ko Wen-je (柯文哲), and Huang Kuo-chang (黃國昌, head of the NPP) would fit this profile.

Equally probable, however, is the use of computation to spread messages about domestic issues. In conversation with the author, one expert journalist in particular thought it likely that high-volume messaging campaigns may have been used around the issue of gay marriage. Though this area is promising, efforts in this working paper, discussed below, have thus far focused on cross-Strait attacks.

In its 2016 Freedom of the Press report on Taiwan, Freedom House stated: "Taiwan's media environment is one of the freest in Asia, and the vigorous and diverse press reports aggressively on government policies and alleged official wrongdoing." However, this is not to say that these outlets are immune to untoward influence—many media owners in the country have significant ties to the mainland and rely on Chinese companies for advertising.

Taiwan's social media landscape is somewhat different from that in countries covered in previous COMPROP research. Though Twitter is available on the island, it is substantially less popular than other social media, notably Facebook and LINE, which interview subjects unanimously agree are the two most popular social media platforms in Taiwan.

It has been claimed that LINE had reached 75 percent of Taiwan's population by late 2015 ("LINE platform," 2015). The company itself verified that over 70 percent had been reached in early 2014 ("World's First," 2014). LINE is a messaging app, similar in functionality to WeChat, Viber or WhatsApp, originally released in Japan. Since its early days as a smartphone-based application, it has grown to become available on other devices, including tablets and desktops.

A rich facet of the social media landscape in Taiwan is the existence of several relatively popular domestic services on the island. The most popular of these is PTT (批踢踢), a bulletin-board service system similar to Reddit. The platform was developed in 1995 and originally only available to college students, and though it is now available to anyone, it remains most popular among current and former college

students. Users can post on "boards" (板) if they are searching for jobs or apartments or can simply chat on different boards, such as the gossip board (八卦板). According to Dr. Strangelove, an interviewee who researches natural language processing, this remains one of the most popular parts of the service, and political discussion is common on these gossip boards (Dr. Strangelove, personal communication, March 7, 2017). Once a comment is posted, other users have the ability to upvote (推) or downvote (噓) content, which has an influence on its overall visibility.

Figure 1: Screenshots of Two Popular Boards on PTT (批踢踢), HatePolitics (黑特) and Gossiping (八卦)
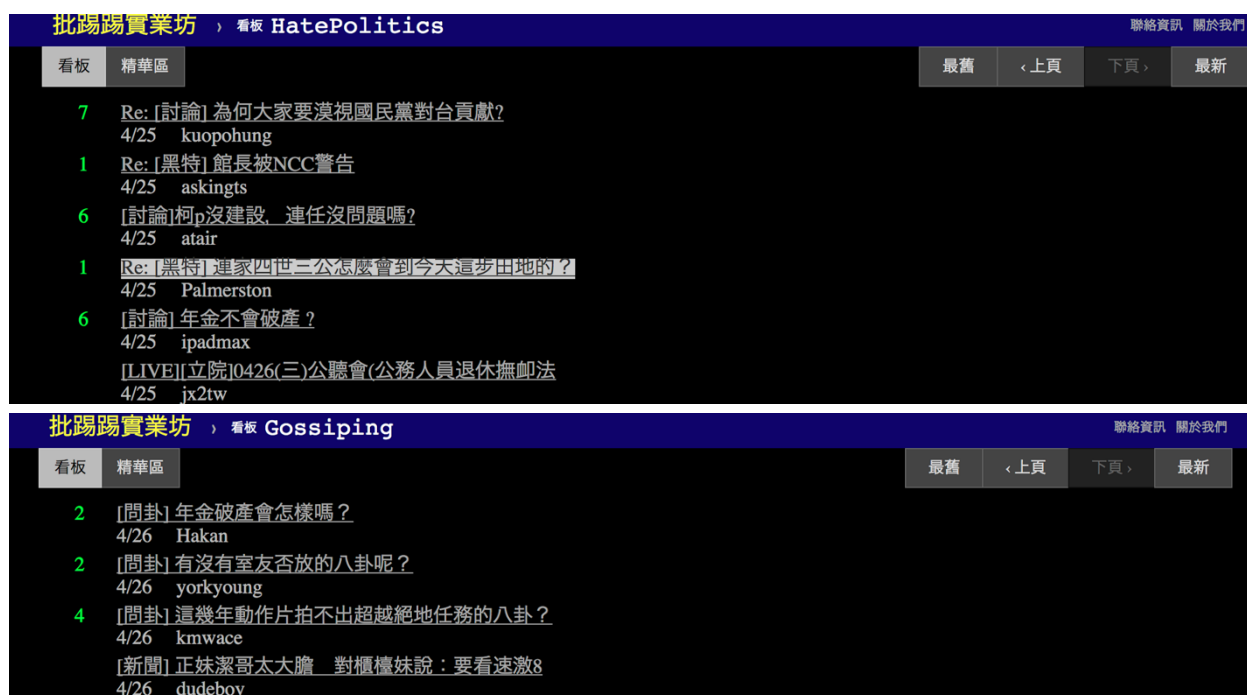
Source: Author's screen capture taken June 16, 2017.

Note: Interview subject Wizard described PTT as "the main" area for political discussion and propaganda in Taiwan: "Facebook is the peripheral." These two boards in particular were mentioned by Wizard as being hotspots for political discussion on PTT.

In conversation with the author, Q Continuum (hereafter referred to as Q) also mentioned several Taiwanese social media platforms that are popular only on the island—among these are Dcard, a social media platform available only to high school and college students, and Plurk, a Twitter-like platform that preceded the tech giant's arrival on the island but still enjoys modest popularity (Q Continuum, personal communication, March 7, 2017;"Tai da," 2012).

Overview of computational propaganda in Taiwan

As mentioned above, this analysis of computational propaganda in Taiwan will be divided into two parts: (1) Taiwan-internal and (2) cross-Strait propaganda. This section will explore the details and potential areas of interest in both arenas.

Taiwan-Internal: Manual propaganda—"cyber army" tactics

One theme that threaded itself through all interviews was manual propaganda— online messaging campaigns carried out by humans for a political cause or persona. All subjects unequivocally agreed that manual propaganda is alive and thriving in Taiwan. The term "cyber army" (網軍) is often used to describe this phenomenon in Taiwan.

"Certainly there are some candidates/politicians/parties who hire 'real persons' to post opinions, comment," said Cortisol, an interview subject who does quantitative political science research in Taiwan. Cortisol also mentioned knowing people who worked as cyber army propagandists on election campaigns:

> I do have some friends; they [were] working for candidates or parties to do that. And they got paid. Not well paid, but still, since they are students it's [an] okay [amount] for them. So, they spend online every day about like one or two hours [posting] news or messages or they attack the other candidates or parties […] [E]specially during the elections, they just mentioned what they [had] done recently. Most of the time they just tell me how they tried to promote the reputation of their candidates online, but I know under the table, they […] tried to attack other candidates. Negative campaigning is very popular in Taiwan. (Cortisol, personal communication, March 9, 2017)

Another interview subject, Wizard, gave additional context on the use of the term "cyber army" in Taiwan:

> Before the 2014 election, it [was] mostly used [to mean] people who disrupt security infrastructures and so on, which is much more serious. It's like the cyber-arming kind of stuff. During 2014 [Taipei mayoral campaign] […] Sean Lien and Ko Wen-je both

accused each other of additional propaganda; they brought up this term "網軍". Then afterwards, it lost any meaning whatsoever. Normal astroturfing is sometimes described as 網軍 as well […] All they have to do is [craft] some memetic device, and then the viral nature of social media will take care of the rest. The people who then spread this news are incidentally 網軍, but they are largely unpaid. (Wizard, personal communication, March 16, 2017)

Taiwan-Internal: Pro-Sean Lien cyber army tactics in 2014 Taipei mayoral race

Ko and Chen (2015) explored data showing that manual propagandists had been used as a cyber army on Taiwan's PTT platform during the 2014 mayoral race. Sean Lien (KMT) and Ko Wen-je (Independent, supported by the DPP) were the two main candidates in this race.

Savvy users on the platform retrieved the IP address of an official representative of KMT mayoral candidate Sean Lien (連勝文). They found an additional 20 accounts using this same IP address, of which 14 posted an unusual number of articles on PTT just a few months before the election. These tended to post articles giving a favourable view of Lien, or giving a negative view of his opponent, Ke Wen-je, who later won the election (Y. Huang, 2017).

Automation and propaganda

Taiwan is no stranger to Distributed Denial of Service (DDoS) attacks. From January to March 2017 alone, the private sector experienced large numbers of DDoS attacks (J. Lin, 2017; Wu & Wagstaff, 2017). Indeed, 2017 has seen an unparalleled increase in the number of DDoS attacks being carried out on the island.

According to Akamai Technologies, in the month from mid-February to mid-March 2017, technology, manufacturing and financial industries were all victims of DDoS attacks. A subset of these attacks were Bitcoin ransomware attacks, in which brokerage firms received threats saying that they would be shut down by DDoS attacks unless they paid a ransom in Bitcoins to a designated account (Y. Huang, 2017). By the beginning of March, over 46 companies in Taiwan had received similar threats (Li, 2017).

The origin of these attacks varies—Bitcoin ransom threats have used numerous different foreign IP addresses, but many private sector attacks on other industries in early 2017 originated from within Taiwan (J. Lin, 2017).

There have also been DDoS attacks on governmental sites. Notably, 2015 saw attacks on several governmental websites from "Anonymous Asia" (匿名者亞洲), including the website for the Office of the President (Guo, 2015). The May 2017 global WannaCry ransomware attacks also ended up infecting at least 226 governmental computers in Taiwan (F. Su, 2017; "WannaCry," 2017).

Crawler bots—intelligence gathering for Ko Wen-je's mayoral campaign of 2014
As briefly mentioned above, the Taipei mayoral race of 2014 was a watershed for digital politics in Taiwan. The two main candidates were the independent Ko Wen-je, a doctor at National Taiwan University backed by the DPP, and Sean Lien, a more seasoned KMT politician.

Many interview subjects mentioned the edge that Ko Wen-je gained by using technology to campaign successfully in 2014. Interview subject Q, who was involved in several technical aspects of the campaign, reported that Ko "trusted numbers" and had faith in a technical approach to campaigning. Moonbeam, another technical expert involved in Ko's campaign, corroborated this view: "[Ko Wen-je] is a doctor, so he really believes numbers." Moonbeam also described the way that technology helped to make up for Ko's lack of experience as a politician prior to the 2014 campaign.

A journalist, Quinine, mentioned in conversation with the author that it was quite probable that political parties were using bots for "intelligence" purposes, gathering information on opposition parties (Quinine, personal communication, February 10, 2017). I was unable to find any more details about this usage of bots until my conversation with Moonbeam.

Moonbeam was part of a team that used data science to help strategize and reach out to different demographic groups. As part of this effort, Moonbeam built an impressive crawler bot for Ko's campaign. This bot would crawl public pages on Facebook and collect all the data it could—how many likes or shares each post got and how many people liked or followed the page, etc.

"We collect[ed] lots of pages from Facebook […] We at least have more than 300+ [Taiwanese] pages in our crawling pool. We updated the data every two hours [during the campaign]."

This bot respected Facebook's privacy terms and only crawled public pages, not individual user profiles. The crawler bot was still able to generate data on individual users, however, given that any Facebook user's activity on a public page is also public.

Moonbeam described the data they would gather from the pages:

> Not only the content; we also crawled the like list. We can [find out] who liked this post: [like] lists are public. The people who like these posts also engage with this kind of content. So that's quite interesting—we can know how many people like the content of Ke Wen-je's fan-page and how many like [Sean] Lien's page [too]. After this, we can know what kind of content can touch the fans' hearts, what kind of audience really cares about this content. (Moonbeam, personal communication, April 6, 2017)

With this data, Moonbeam could classify users into interest groups, such as people who care about wildlife preservation, or avid board game players. Using this information, the team Moonbeam worked on could tailor a message to the group, emphasizing how voting for Ko Wen-je would benefit them. Moonbeam mentioned that "like lists" of users could be used to determine who should be contacted or targeted for advertising. Days before the election, Moonbeam used their data to send tailored messages to over ten groups, encouraging them to vote for Ko Wen-je and emphasizing the main issue of the groups they belonged to. "On the Facebook ads system, we can have precise targeting," Moonbeam told me.

Apart from targeting users with tailored messages, the intelligence gathered by this bot was also useful to gauge voters' reactions to real-time events, such as mistakes Ko Wen-je made, or campaign strategies. For instance, if Ko Wen-je made a controversial mistake in a speech, Moonbeam's team would be able to generate a

list of how many users removed their "like" from Ko Wen-je's fan page and then "liked" the fan page of his opponent, Sean Lien. Moonbeam highlighted that this approach ended up being a useful kind of ad hoc, heuristic political training for Ko, who was not experienced as a politician and had never previously run for office.

Overall, Moonbeam estimated that the team generated data on 11–14 million Taiwanese users on Facebook. This is astounding given that the island's population is only around 23 million (Central Intelligence Agency, 2016). This is also a very powerful tool insofar as Facebook is the most popular social media platform online—an ideal place to collect real-time data on users' political musings and feelings. Though Moonbeam did not mention aggregating public records data or building comprehensive profiles on Facebook users, this method was still somewhat redolent of Cambridge Analytica's microtargeting methods in the Brexit referendum and the 2016 US presidential election (Grassegger & Krogerus, 2017).

Fake news

Taiwan has not been immune to the fake news epidemic plaguing societies around the world recently. As mentioned above, LINE is one of the most popular social media platforms in Taiwan, and fake news stories have recently been spreading on the platform prolifically. In conversation with the author, a web developer, Surefire, mentioned that fake news in Taiwan has been both political and apolitical. While there have been stories smearing gay rights activists that have spread, there have also been many apolitical stories relating to health that have spread virally.

The insidious nature of false information is compounded by the fact that many LINE users are not experienced internet users. Surefire mentioned that, given that one only needs a smartphone and an internet connection to use LINE, many users are not very savvy and may not know how to fact-check an article or use Google.

Leading researchers have highlighted that solutions to misinformation online cannot be purely technological—social solutions are also crucial. In this vein, danah boyd of Data & Society recently wrote: "Addressing so-called fake news is going to require a lot more than labeling. It's going to require a cultural change about how we make sense of information, whom we trust, and how we understand our own role in grappling with information" (2017). In Taiwan, both social and computational responses to the problem are currently under way.

Social response to fake news

Taiwan's digital minister, Audrey Tang, recently revealed that there is a plan to address the problem of rumours and fake news online through public education, such as teaching students to identify a fake domain online. Nicola Smith interviewed the digital minister, who unveiled in April 2017 that "media literacy" will be on the curriculum in Taiwanese schools in the next year. In conversation with Smith, Tang said, "I would say that we take freedom of speech much more seriously than most of the other Asian countries. Many other Asian countries see it as a utilitarian value that could be traded somehow, if some other value of higher utility, like national security, is at risk. But for many Taiwanese it's a core value […] and I think we're unique in that" (Smith, 2017).

Computational response to fake news—the fake news fighting LINE bot

In addition to the social response, a computational solution to the problem is also currently under development. Johnson Liang, an engineer working in Taiwan, decided in late 2016 to build a LINE bot to combat fake news (H. Huang, 2017). The Taiwanese civic technology collective g0v.tw (read as "gov zero"; Chinese: 零時政府) decided to lend additional funding to the project in early 2017 because of the promise it showed (g0v.tw, 2017).

To combat this problem, a team of developers with funding from g0v.tw have decided to build a LINE bot called 真的假的—which roughly translates to "Are you kidding me?!" or "For real!?". The idea behind the bot is simple—after a user adds the LINE bot as a friend, the user can send suspicious links to potentially fake news articles to the bot. The bot will then report back on whether the article is false and will provide relevant facts on the issue.

This bot was created in late 2016. Although it is still under active development, media and popular interest in the bot have exceeded expectations. A developer who works on the project, Surefire, talked with the author about the goals of the project:

> The ultimate goal of this LINE bot—I hope that not only the rumours can get a response. Any article that has an opinion […]

> We can attach replies that will provide an opposite opinion or different views to those messages. The platform can become something greater—currently [it] is about rumours and rumour busters. Later we can use it to link articles to each other. It's not only about web development […] it's also about building a community of editors. (Surefire, personal communication, March 27, 2017)

Currently, an article that has been reported by someone is posted to a board of articles that are to be reviewed. Then, editors (小編) are invited to contribute from their respective areas of knowledge about what is problematic about the article. A standard response, with links to supporting evidence, is crafted from this crowdsourced knowledge and saved. If new users report the article, they will automatically receive the standardized response. Surefire reported that in the first three months of LINEbot, over 5,000 stories have already been reported to the bot.

This bot represents a novel use of bots that does not fit cleanly into previous typologies of political bots' behaviour (Woolley, 2017). It uses human contributions to build its databank of answers, but functions on its own after this stage. It shows promise in its transparency and its use of both social and computational methods to address a complex problem (Hwang & Woolley, 2016).

Cross-Strait propaganda

As mentioned above, one type of international propaganda is particularly relevant in Taiwan—messaging coming from the mainland, generally promoting reunification of Taiwan and China and discouraging liberal democratic polity. There is currently no research to suggest that this phenomenon is anything but unidirectional: it would seem that China's efforts to spread propaganda in Taiwan are not being mimicked from Taiwan to China.

Notes on mainland China's propaganda efforts

Taiwan is unique insofar as it exists on the peripheries of one of the most prolific propaganda-filled regimes on earth—mainland China. Although the country functions as an independent political entity, it is nevertheless a satellite target for China's propaganda efforts, given the two countries' complex relationship. A brief

examination of propaganda efforts on the mainland will help contextualize cross-Strait propaganda efforts from China to Taiwan.

China is a country notorious for its censorship and propaganda efforts online (He, 2008; Ng, 2013). The government drives its own propaganda efforts, of course, both through official means such as governmental units, the People's Daily and the Communist Youth Party, but also through more insidious methods such as the 50-cent Party (五毛黨)(McGregor, 2010; Weiwei, 2012). The last was believed until recently to consist of private citizens paid to post pro-government content and argue in favour of the Party online. Recent research has suggested that the 50-cent Party is more likely to be composed of public employees—not private citizens—who tend to post "cheerleading" content but do not engage in acrimonious debate.

Researchers Gary King, Jennifer Pan and Margaret E. Roberts recently published a thorough analysis of a trove of leaked emails to and from the Zhanggong district Internet Propaganda Office (章貢區網宣辦), in the province of Ganzhou, China. The conclusions of this research shed light on the nature and internal workings of the 50-cent Party, a faction within China thought to be paid by the government to promote the Party's views online.

King, Pan and Roberts (in press) mention finding "a massive government effort, where every year the 50c party writes approximately 448 million social media posts nationwide". The team's research also indicates that:

> the purpose of 50c activity is (a) to stop arguments […] and (b) to divert public attention from actual or potential collective action on the ground […] that the 50c party engages in almost no argument of any kind and is instead devoted primarily to cheerleading for the state […] It also appears that the 50c party is mostly composed of government employees contributing part time outside their regular jobs, not, as has been claimed, ordinary citizens paid piecemeal for their works (p. 29).

The researchers also found no evidence of automated propaganda efforts: "We also looked extensively for evidence that 50c posts were created by automated means such as bots, but the evidence strongly indicates […], that each was written by a

specific, often identifiable, human being under direction from the government" (p. 11).

Overall, this research indicates that 50-cent propagandists tend to be cheerleaders rather than arguers, and "promoting unity" is an explicit goal in leaked directives (p. 14).

It would not be unreasonable to think Taiwan could be a rare exception: a country where unity could be promoted through more acrimonious attacks. Quinine and other interview subjects noted the deep conviction the average mainlander feels about the Taiwan issue—Taiwan may represent a rare area where allowing acrimony may serve to unify mainlanders.

Of course, in addition to official, state-directed propaganda, there are also online harassment and trolling campaigns organized by what seem to be ordinary citizens. We will explore such campaigns below.

Online campaign against Leon Dai (戴立忍)

Chinese netizens on Weibo mobilized against a popular Taiwanese actor, Leon Dai, when it was announced that he would be starring in a popular Chinese director's new film, No Other Love. After Zhao Wei, the director, made the announcement on Weibo, articles appeared on Weibo and in the China Military online newspaper (中國軍網), an outlet that is officially sponsored by the Chinese People's Liberation Army, expressing outrage about the Taiwanese actor's involvement ("Xuan jiao shang hai min zu gan qing," n.d.). These articles demonized Leon Dai for his involvement in Taiwan's Sunflower movement and claimed he supported Falun Gong—a persecuted religious group in China. After weeks of online fury, Zhao Wei announced online that Dai would be replaced in the film. Dai, Zhao and the film's producer apologized online for the incident (L. Lin, 2016).

It is also relevant to note that "hurting the feelings of the Chinese people" ("傷害中國人民的感情") was an accusation levelled at Dai in this campaign. Many targets of trolling or political frustration have been accused of this, such as Ursula Gauthier, a French journalist who, after significant online trolling and official persecution, was eventually ousted from China for her reporting questioning the Party's official narrative on the fractious Xinjiang province (Forsythe, 2015; RFI, 2015; J. Su, 2016).

Joel Martinsen of Danwei, a website that covers Chinese media, found that an astounding 19 countries and organizations had been accused of "hurting the feelings of the Chinese people" in the pages of the People's Daily between 1946 and 2008 (Martinsen, 2008).

Though there is no evidence that there was governmental involvement in this event, it is important to note that governments have been involved in similar incidents before. This was notably the case with Indian movie star Aamir Khan. After Khan made statements about feeling unsafe as a Muslim in Prime Minister Narendra Modi's India, an online petition began that eventually successfully convinced the company Snapdeal to terminate its business ties with Khan (Safi, 2016). In her *book I am a Troll*, Swati Chaturvedi recently revealed that members of the government's IT cell had received orders to promote this petition online (2016). The Chinese government could easily espouse similar tactics in the future.

Suspicious Chinese accounts in the Twittersphere

As mentioned above, Twitter does not enjoy a prominent status in Taiwan—all interview subjects firmly agreed that Facebook, LINE and PTT have substantially more activity on the island. Nevertheless, the oddity of Chinese netizens hopping over the Great Firewall for the Diba Facebook campaign (explored in the next section) made our team curious about whether similar coordinated mainland messaging campaigns were occurring on Twitter.

We attempted to find similar evidence of a coordinated campaign on Twitter during the observation period (roughly January–April 2017), but were ultimately unable to find any evidence of a large-scale automated effort. Be that as it may, there are still a large number of suspicious accounts on the platform that deserve to be considered in future research.

"Suspicious" is meant here to denote two characteristics: (1) displaying signs that typify political bots and/or (2) acerbic accounts abusing President Tsai Ing-wen online, or generally promoting pro-unification views on Twitter. While the latter is not necessarily indicative of governmental involvement, it would be a topic expected to appear in organized propaganda efforts.

The abuse hurled at Taiwan and Taiwan's president online had a few motifs in common: intentional misspelling of Tsai's name (using the homonymous character 菜, meaning vegetable), using insults with the word "dog" in them, calling Tsai the "head of Taiwan county"—implying that Taiwan is a province belonging to the mainland—and accusing Tsai of being Japan's and America's lapdog, to name a few. Abuse also ranged from trivial and puerile to acrimonious and obscene.

In the preliminary stage of our collection, we selected over 50 accounts that displayed signs of being propaganda accounts on a qualitative basis. A few such qualitative criteria, and screenshots of suspicious accounts, are shown below:

1. Recent date of creation, for example many accounts attacking President Tsai in March 2017 were created in February or January 2017;
2. No profile picture (until recently, Twitter displayed a white oval over a coloured background for such accounts, colloquially known as a "Twitter egg");
3. Long or maximum-length handles (15 characters is the current maximum length for a Twitter handle);
4. Twitter handle resembling a randomly generated string of numbers and letters;
5. Tweets in simplified Chinese;
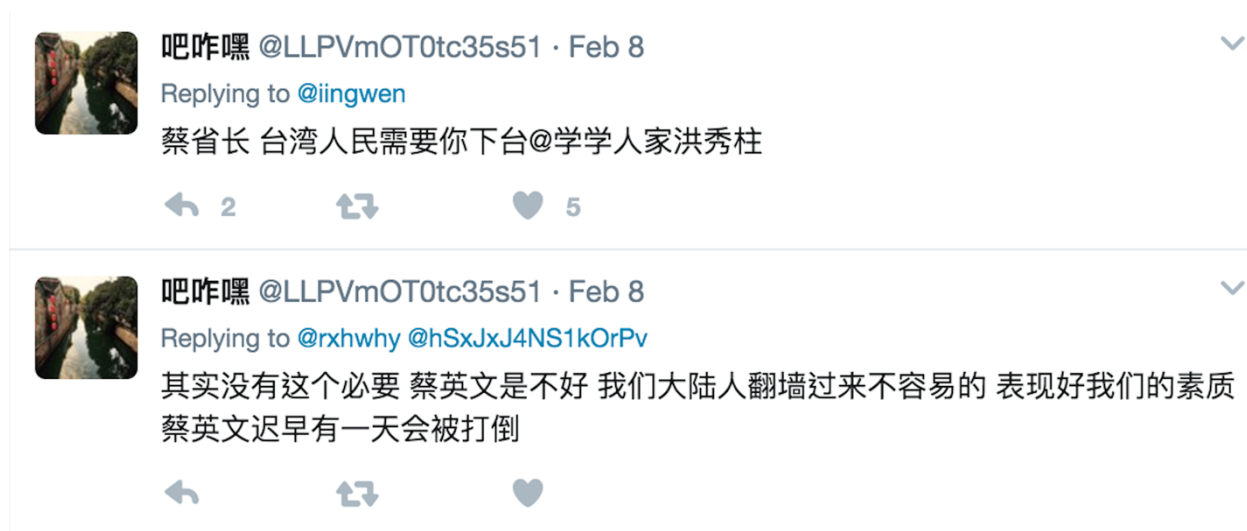6. Lack of followers, higher number of following.

Figure 2: Screenshot of Suspicious Accounts on Twitter

Source: Author's screenshots June 16, 2017.

Note: Signs include having a handle of maximum length that seems randomly generated, lacking a profile photo or follower base and exclusively tweeting abusively at Taiwan's President Tsai Ing-wen. These and many other suspicious accounts tweeting abusive messages at President Tsai had also only joined a few weeks before engaging in abusive behaviour on Twitter.

Figure 3: Political Abuse on Twitter Aimed at President Tsai Ing-wen

吧咋嘿 @LLPVmOT0tc35s51 · Feb 8
Replying to @iingwen
蔡省长 台湾人民需要你下台@学学人家洪秀柱

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吧咋嘿 @LLPVmOT0tc35s51 · Feb 8
Replying to @rxhwhy @hSxJxJ4NS1kOrPv
其实没有这个必要 蔡英文是不好 我们大陆人翻墙过来不容易的 表现好我们的素质
蔡英文迟早有一天会被打倒

Source: Author's screenshot June 16, 2017.

Note: The first tweet reads "County head Tsai, Taiwan's people need you to step down, learn from others like Hung Hsiu-chu"—a KMT politician who was ousted from the 2016 presidential race for explicitly supporting unification with the mainland. The second tweet reads "actually there's no need, Tsai Ing-wen is bad. We mainlanders will hop over the wall and come over there no problem and show you what we're made of. Tsai Ing-wen will be toppled one day soon enough."

After this first step of manually culling suspicious accounts, we used Twitter's streaming API to track the @mentions for President Tsai Ing-wen (@iingwen) and followed her Tweet ID. This allowed us to capture tweets mentioning her username, as well as capture her own tweets. We collected this data from 23 April to 29 April

2017. Overall, we captured 1,396 tweets from 596 unique users during this week. These tweets included 6 tweets from her own account. We also captured 347 retweets of the president's recently posted tweets.

The most active user in this time frame was @UFsh1rxk2IVOgAd, an account that was almost certainly automated. The account had no profile picture; a maximum-length, seemingly random handle; tweeted in simplified Chinese (the mainland writing system); and sent nearly all of its tweets in fours within the span of a minute. It only joined Twitter in January 2017, and tweeted 52 of its 123 total tweets at President Tsai Ing-wen. This account's abusive tweets ranged from puerile and innocuous to extremely obscene and misogynist. While editing this report, this account also disappeared from the platform entirely.

While we are very certain that this account was a bot, we were unable to find many others so obviously automated, or evidence of large-scale automation. Our hopes were that tracking the interactions of these accounts and analyzing their networks and metadata would yield evidence of automation or coordination, but unfortunately we were unable to find any signs of mass automation in the data.

Again, this was to be expected in light of the fact that Twitter is a banned platform in China and is not particularly popular in Taiwan. It further supports the findings of King et al. (2017) that no evidence of automation could be found in the 50-cent Party leak from the Zhanggong Propaganda Office from 2013 to 2014.

Furthermore, in discussion with the author, an interview subject named Quinine highlighted an important fact in this regard. Taiwan is a subject about which nearly all mainland Chinese feel an ardent, sometimes jingoistic, sense of conviction. Quinine highlighted that, given China's huge population and the passion mainlanders feel about Taiwan, it is conceivable that the Party has no need to automate cross-Strait propaganda efforts. This tallies with our current findings and previous research.

Two alternatives to automating cross-Strait propaganda exist for the mainland:
   a) The laissez-faire approach of letting normal citizens air their opinions online; or
   b) Paying or otherwise incentivizing public employees or private citizens to promote the regime's views on Taiwan online.

Of course, these two approaches aren't mutually exclusive. Engaging in either may well be enough to accomplish the Party's goals.

The 2016 Diba Facebook expedition

Our foray into Twitter described above was inspired by an incident that occurred in early 2016, shortly after Tsai Ing-wen was elected as president of Taiwan. Sia, Woolley, Monaco and Howard (2016) carried out in-depth computational analysis of this campaign—the "Facebook expedition" carried out by the Chinese netizens from the popular online forum Diba (帝吧fb出征). Though this analysis did point to coordination, it did not conclusively prove that there was automation in the campaign. Our full-length paper on this topic is forthcoming; a brief description of our work follows below.

Figure 4: *Screenshots of Tsai Ing-wen's First Party Meeting Facebook Post After Being Elected President in 2016.*

Source: Photo from Sia et al. (Forthcoming).

Note: This post was the target of a coordinated messaging campaign from the Chinese members of the Baidu forum Diba (帝吧), which has been involved in several trolling incidents (Z. Huang, 2017).

Diba is an online forum, one of the many hosted on China's Baidu Tieba (百度貼吧), which is similar to Reddit. Diba has been described by Quartz's Nikhail Sonnad as "the largest group [on Tieba] of all, with a staggering 20.6 million users […] like 4chan, but for Chinese patriots" (Sonnad, 2016). Diba has been involved in several coordinated trolling incidents since 2016 (Horwitz, 2016).

The Diba Facebook campaign of 2016 was a coordinated grassroots messaging campaign on President Tsai Ing-wen's Facebook page shortly after her election in January 2016. The goal of this mass messaging was to show the reaction of Chinese citizens to Taiwan's election of Tsai Ing-wen, who is a member of the pro-independence Democratic Progressive Party (DPP) in Taiwan. This event was covered in Taiwanese media, the China Digital Times and also in a select few Western outlets such as Quartz and the Wall Street Journal (Henochowicz, 2016; M. Huang, 2016; Z. Huang, 2017).

For this particular campaign, Diba members organized what was referred to as "Diba's Facebook Expedition". The attackers posted pro-mainland comments on President Tsai's Facebook post from 20 January 2016 on Tsai Ing-wen's web page (Tsai, 2016). Tsai had been elected four days prior on 16 January. The members of the forum also attacked the official fan pages of a popular Taiwanese newspaper, Apple Daily (蘋果日報) and of a famous singer from Hong Kong, Ho Wan see (何韻詩) ("Zhongguo di ba," 2016).

The targeted post garnered 49,541 total comments and replies from 20 January to 4 April, which was a disproportionate number in comparison with all other posts on her wall. An interesting point to note is that this organized effort would have had to use techniques to circumvent the Great Firewall, since Facebook is banned in the People's Republic ("Chinese society: Looking ahead," 2016; Horwitz, 2016). Most of these posts expressed opposition to Taiwanese independence and extolled the Communist Party's rule in mainland China. One phrase in particular was repeatedly used among pro-China commenters, 八榮八恥—"Eight Honors and Eight Shames". These eight principles of morality were penned by former president of China Hu Jintao, and were part of his Socialist Conception of Honors and Shames (社會主義榮辱觀), a document meant to be a moral guide for citizens of China, released in 2006 ("Hu Jintao ba rong," 2006). Many commenters typed out the full eight lines of these principles in their comments on Tsai Ing-wen's post.

Our team explored this post further. Though ultimately we did not find clear evidence of entirely automated accounts, we did find signs that there was heavy coordination and overlap between messages being posted promoting the PRC.

As an initial step, we crawled all comments and responses on the post using the Facebook Graph API. We then automatically separated users into Chinese and Taiwanese sets, based on their predominant writing system. It is important to note that mainland China and Taiwan use two slightly different orthographic systems to write Mandarin Chinese. Mainland China uses simplified characters, which Mao Zedong made the official writing of the mainland in 1956. Taiwan still uses the traditional writing system ("Chinese, Mandarin," n.d.). This is briefly illustrated in Table 1 below:

Figure 5: *Traditional Vs. Simplified Chinese*

Traditional (used in Taiwan)	龍	葉	龜	人
Simplified (used in China)	龙	叶	龟	人 (no change)
Pronunciation	lóng	yè	guī	rén
Meaning	dragon	leaf	turtle	person

Source: Author

This was a useful heuristic for separating users into Chinese and Taiwanese accounts. Chinese users are of course able to type in traditional, Taiwan-style characters, just as Taiwanese users can type in simplified characters, but it is reasonable to assume most type using their native writing system, in keeping with the linguistic principle of least effort (Zipf, 1949). We classified accounts according to whether their writing favoured one system over the other with a ratio of at least 6:5. Accounts that didn't meet this threshold were classified as "unknown".

After this step, our team ran various computational analyses on the users in question. We analyzed accounts according to temporal, semantic and network characteristics. For the temporal dimension, we analyzed the coordination between accounts posting in the first 24 hours through Euclidian and Dynamic Time Warping distance. For semantic analyses, we used a Latent Dirichlet Allocation algorithm to explore overlap of messaging between accounts. We also analyzed the entropy of accounts' messages in attempts to find signs of automation. Finally, for the network dimension, we observed connections between accounts using identical posts as

edges linking users (nodes). For the latter, we observed a much higher network connectivity among Chinese accounts than among Taiwanese ones.

Our full results are forthcoming. Overall, a few conclusions can be drawn from this incident:

1. Though we attempted to find signs of automation in the data, we did not find any accounts that were fully automated. We did, however, find evidence of heavy coordination for mainland accounts. This could be indicative of a cyborg approach, in which some automation was used in tandem with human intervention (Ferrara, Varol, Davis, Menczer, & Flammini, n.d.).
2. In the 24 hours following the original post, the highest rate of posting by a single user was 2.3 posts per minute. The user with the greatest number of contributions posted 825 times within the observed period, but also had diverse content (with an entropy measure of .94 on a scale of 0–1). Both of these statistics, while on the upper bound of human activity, have not quite reached infeasible levels. All the same, they represent extraordinary engagement and may lend more credence to the cyborg theory.
3. For the most part, the content posted was not extremely acrimonious or invidious in nature. The messages mainly expressed a desire to reunify China and Taiwan and extolled the Eight Honors and Shames.
4. Though there is no reason to believe that the 50-cent Party was involved in this incident, these findings tally with the research discussed above from King et al. (in press) in that there is little evidence of automation, little to no acrimony in messaging, and messages seem to have the ultimate goal of distracting or stifling discussion, rather than arguing.

Conclusion

This working paper aimed to explore three questions: (1) Is computational propaganda present in Taiwanese society?, (2) What is the composition of

computational propaganda in Taiwan? and (3) Where are campaigns most likely to come from?

After reviewing the data, we can be sure that computational propaganda is heavily present in Taiwan. Domestic campaigns take the form of manual propaganda through the use of cyber army tactics and automated intelligence-gathering techniques. Many subjects also expressed confidence that political bots are being used on PTT, a domestic bulletin-board system, but no research has conclusively proven this. Benevolent political bots are also being used to combat fake news on LINE, a popular messaging app and social media platform in Taiwan.

In addition to domestic campaigns, cross-Strait propaganda is also present. We have seen that bots do not thus far seem to be present in official Chinese government propaganda techniques, nor have we seen them in civilian propaganda campaigns (such as the many Diba trolling/mass-messaging incidents that have taken place in recent years). Our analysis of Twitter accounts in the Taiwanese Twittersphere, Facebook accounts from the 2016 Diba Facebook expedition and the research on domestic Chinese propaganda leads us to believe that automation does not yet figure heavily in Chinese propaganda efforts, nor even across the Taiwan Strait. Furthermore, the People's Republic of China benefits from immense reserves of human capital—legions of citizens who feel a sense of personal mission when it comes to the Taiwan issue, and who in so doing become megaphones for the official party line of the Chinese Communist Party. These facts do not preclude usage of malicious political bots in future Chinese propaganda efforts, but they lead to the conclusion that bots do not currently play a central role in China's official propaganda apparatus.

The digital sphere will occupy an ever more important role in Taiwanese politics in the years to come. Ko Wen-je's digital campaign in the Taipei mayoral election of 2014 was successful and transformative, heralding in a new era for politics on the island.

About the Author

Nick Monaco is a research associate at Jigsaw. He received his Master of Science in Computational Linguistics from the University of Washington in 2016. His research interests include Chinese, French and German linguistics, automation/AI, bots, computational propaganda and foreign affairs.

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