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Showcasing, Contextualizing, and Explaining the Diversity of Human Experiences in Combat Using GIS: The Battle of Hong Kong in 1941 as an Example

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Abstract

This article discusses the application of GIS in the study of military history, particularly for campaigns in modern Asian history (1800s-1950s), citing the Battle of Hong Kong 1941 Spatial History Project as an example. GIS allows researchers to move beyond text-based narratives by visualizing, contextualizing, and explaining the diversity of human experiences that are often overshadowed by frontline actions. This article assesses the use of GIS-based interactive maps in visualizing the flow of the battle, reconstructing the battlefield, examining the diverse human experience, and integrating disparate historical data. Reflecting on the research team's interdisciplinary experience in creating a GIS-based interactive map, this article argues that such a method is suitable for military campaigns that took place in a rapidly changing urban environment. It also discusses the limitations of this method and the need to remain critical towards the visualization of data, the use of sources, and interpretation.

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Introduction

On 8 December 1941, Japanese forces (totalling around 35,000 men, including logistics, air, and naval elements) invaded Hong Kong, home to around 1,500,000 people held by a multi-ethnic garrison of approximately 13,500. The Japanese forces first entered the New Territories from the north along the Hong Kong-China border, and after a surprise night attack took Shing Mun Redoubt in the evening of 9–10 December, a strong point along the Gin Drinker's Line, the main defensive line of the garrison on the Kowloon Ridge. With the fall of Golden Hill on 10 December, the British forces withdrew to Hong Kong Island from 11 to 13 December. After five days of bombardment, Japanese forces, expecting minimal resistance, landed on the Island on the evening of 18 December and met a determined stand of the garrison. Another seven days of fighting on the eastern and southern parts of the Island went on, and the garrison surrendered on Christmas Eve when the Japanese forces were about to reach the City of Victoria, where the headquarters of the garrison and the Hong Kong government were located. About 9,600 combatants and civilians on both sides were killed and wounded during the period, with at least 2,000 civilians. The true toll could be higher due to the post-battle chaos and Japanese atrocities, but the numbers remain murky.[1] The Battle was followed by the Japanese occupation, a period of the humanitarian disaster known as "the three years and eight months (*sam-nin ling baat-goh-yet*)" that witnessed forced migrations of hundreds of thousands of citizens, forced labour, starvation, economic exploitation, violence, and collapse of public service. The total death toll in Hong Kong during the war could be as high as 360,000.[2]

Citing the Spatial History/Historical Geographic Information Systems (GIS) project on the Battle of Hong Kong conducted by the research team, this article argues that GIS-based interactive maps can provide a more nuanced

1 Percy Selwyn-Clarke, *Report on Medical and Health Conditions in Hong Kong: for the Period 1st January 1942–31st August 1945* (London, 1946), 18.

2 Tony Banham, "Hong Kong's Civilian Fatalities of the Second World War", *Journal of the Royal Asiatic Society Hong Kong Branch* 59 (2019): 46.

and inclusive way of showcasing, contextualizing, and explaining the diverse human experiences in military history.[3] Although GIS has been widely used in historical studies, its application in military history, especially battles during modern times (19th and 20th centuries), has been surprisingly limited. In our case, we attempt to curate the battle using an animated interactive map and incorporate data about the diverse human experiences during the battle. This allows us to explore the battle in a more balanced manner and move beyond the reconstruction of the battle's progress and documentation of war-related built heritage.

This article first discusses the research questions of studying the Battle of Hong Kong in December 1941 before turning to the authors' Spatial History project about the battle. It describes the scope and methodology of the project and discusses some of the main issues, such as the potential danger of the sanitization of war and the ways to incorporate the people's voice in an event mainly seen from the soldiers' perspective. It then turns to a discussion of using the GIS-based interactive map of the Battle of Hong Kong to explore and understand the human experiences during the battle. In all, this paper argues that while GIS is a useful tool to achieve a more inclusive account of war, practitioners of such projects should be conscious of the many potential pitfalls the approach presents.

Research Questions

The creation of a GIS-based interactive map about the Battle of Hong Kong is a methodological response to the need to create a means to visualize the flow of the battle, recreate the battlefield, document the related built heritage, and most importantly organize and integrate scattered sources about the human experiences that are often omitted in the previous accounts that usually focus on frontline actions. Through the interactive map, we seek to look at the diverse human experiences during the battle, especially those who were omitted in the narratives that focus on frontline actions, such as the soldiers from different ethnic groups, non-combatants such as medical and civil defence personnel, women in various services, and even children who were caught in the fighting. The project also attempts to set an example of using GIS to build interactive

3 The digital project discussed in this article: the Battle of Hong Kong Spatial History Project, launched in 2021; a Spatial History project about the Japanese invasion of Hong Kong, 8–25 December 1941. See: "The Battle of Hong Kong 1941: A Spatial History Project 1941", accessed 15 February 2024, https://digital.lib.hkbu.edu.hk/1941hkbattle/en/index.php.

and animated maps to curate military campaigns in Asia during the Second World War; such experience can perhaps be used to curate military campaigns in other parts of Asia, particularly in an urban setting, such as the battles of Shanghai (1937), Singapore (1942), and Manila (1945), and offers opportunities for more a balanced treatment of historical battles. This approach, we argue, is suitable for cities in Asia such as Hong Kong, where systematic attempts to record the war experience after the conflict were absent, unlike in the United Kingdom, Europe, and the United States, and rapid post-war changes overshadowed the memories of the war.

Discussions on Hong Kong's wartime experience usually focus on the Japanese Occupation, and the war memories soon faded because of the subsequent political and economic developments and the influx of migrants with different war experiences.[4] It was not until the 1980s that the wartime experience was "rediscovered" due to the veterans' attempts to gain rights and recognition, especially the right to abode in the United Kingdom and compensation for their sufferings.[5] Discussions of the civilian sufferings during the war also gained traction in society, with the appearance of popular history works and documentaries.[6] The surge of interest in the war during the 1980s and 1990s led to attempts to collect wartime memories in the form of oral history, but their focuses are usually on the Japanese Occupation rather than the battle, which has usually been treated as a short transitional period from daily routine to the experience of occupation. This war memory also gradually faded after 1997 because of the passing of the wartime generation and the events after the Handover. Memories of the war were only invoked when the term "three years and eight months" was used to describe calamity or prolonged suffering, from economic downturn to perceived misrule by the government.[7]

Meanwhile, the Battle of Hong Kong has been mainly studied as a separate military campaign usually from the British perspective, with discussions focusing on the operational and tactical details.[8] This is understandable,

4 Edward Vickers and Alisa Jones, eds., *History Education and National Identity in East Asia* (London, 2005), 173.

5 Kwong Chi Man, *Hongkongers in the British Armed Forces, 1860–1997* (Oxford, 2022), 191–198.

6 For example, see Xie Yongguang (Tse Wing Kwong), *Xianggang lunxian: Rijun gong-Gang shibari zhanzheng jishi* [The Fall of Hong Kong: A Narrative of the Eighteen Days of the Japanese Army's Invasion of Hong Kong] (Hong Kong, 1996); Xie Yongguang, *Xianggang kangri fengyunlu* [Stories of Hong Kong Resistance] (Hong Kong, 1995).

7 For one of the many examples, see *Hong Kong Daily News*, 6 November 2002, C10.

8 Philip Cracknell, *Battle for Hong Kong, December 1941* (Stroud, 2019); Kwong Chi Man and Tsoi Yiu Lun, *Eastern Fortress: A Military History of Hong Kong* (Hong Kong, 2014); Kwong Chi Man and Tsoi Yiu Lun, *Guduk chinsaau – taaipingyeung jinjang jung dik heunggong*

as narratives about a battle have to concentrate on the main flow of events instead of constantly diverging on other aspects or individual experiences. In the past two decades, scholars have turned their attention to the hundreds of war ruins or war-related heritage sites scattered across different parts of Hong Kong.[9] Popular history about the battle and battlefield tours in the name of commemoration focus on British-built military structures such as pillboxes and batteries.[10] The Hong Kong Special Administrative Region Government has been more active in preserving war-related built heritage, partly because of the advances in knowledge.[11] Transnational institutions such as the Royal British Legion and the Commonwealth War Graves Commission also commemorated the war, and their focus has been on the experience of the British combatants until very recently. The above developments led to a peculiar situation: while the battle and the related war ruins have been studied in detail, the experience of many others who experienced the battle remains obscure.[12]

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jinyik [Exposed Outpost: The Battle of Hong Kong in the Pacific War] (Hong Kong, 2013); Lawrence W. C. Lai et. al., "Decoding the Enigma of the Fall of the Shing Mun Redoubt Using Line of Sight Analyses", *Surveying & Built Environment* 21 (2) (2011): 21–42; Tony Banham, *Not the Slightest Chance: The Defence of Hong Kong, 1941* (Hong Kong, 2003).

9 Y. K. Tan, Stephen N.G. Davies, and Lawrence W.C. Lai, "Special Issue: Pillboxes along the Gin Drinker's Line", *Surveying & Built Environment* (April 2022); Y. K. Tan, Stephen N.G. Davies, and Lawrence W.C. Lai, "Special Issue: Pillboxes on Hong Kong Island in the Era of World War II." *Surveying & Built Environment* (December 2021).

10 Daniel Schumacher, "'Privates to the Fore': World War II Heritage Tourism in Hong Kong and Singapore", *World History Connected* 11 (1) (2014): 30–40.

11 Notably, the new explanation panels have been installed at various military heritage sites such as Pinewood Battery, Mount Davis Fort, MacLehose Trail, and Wong Nai Chung Gap. The government currently keeps a list of 76 war-related historical sites, and they are categorized into those related to the Six Days War in 1899 (10), the Battle of Hong Kong (50), and the Chinese Communist resistance (16). See "List of declared monuments, historic buildings, and proposed grading items related to the Six-Day War against the British in the New Territories in April 1899, the Battle of Hong Kong from 8th to 25 December 1941, and the Hong Kong-Kowloon Independent Battalion of the Dongjiang Column", Legislative Council papers, accessed 15 February 2024, https://gia.info.gov.hk/general/202306/07/P2023060700662_421471_1_1686136698573.pdf.

12 The Royal British Legion and the Commonwealth War Graves Commission have committed to commemorating the diversity of the participants and victims of the war in recent years. For example, the former released a study conducted by Nigel Collett of all the military burials in Hong Kong from 1786 to 1997, regardless of ethnicity. See Nigel A. Collett, *The Book of Remembrance of the Royal British Legion Hong Kong & China Branch*, Vols. 1–4 (Hong Kong, 2021).

In the above context, those studying Hong Kong's wartime experience would encounter different related sources that enable or limit their research. Perhaps surprisingly, both sides kept detailed military records about the campaign, even though one side endured the war as prisoners of war and the other surrendered at the end of the war. These sources are now available in the archives in Hong Kong, Japan, and the United Kingdom.[13] Veterans on both sides also left numerous accounts, particularly the British, Canadian, and Japanese.[14] Detailed maps of Hong Kong during the 1940s also exist, although none fully depicted the situation on the ground in December 1941. Photos taken during the war are also available, although only in limited numbers, and only those taken by the Japanese survived. War ruins, as mentioned, could also be found in different parts of Hong Kong. While these sources are in various forms, they almost invariably contain geographical information that allows them to be included and analysed in GIS-based platforms.[15] Thus, the existing sources allow a detailed reconstruction of the battle, using sources from both sides instead of presenting only one side's perspective.

On the other hand, however, accounts from non-military personnel, especially from the non-European perspective, have been scattered and difficult to come by. As mentioned, oral history records usually focus on the occupation experience instead of the confusing battle that was not well understood when these oral history interviews were conducted. Moreover, most interviewees knew little about the context of their experiences. Glimpses of the non-combatants' experiences in the battle have to be obtained from biographical sources such as diaries and memoirs, in addition to oral history records. As it is already more than eight decades since the battle, it is now doubtful that new oral history interviews with a focus on the civilian experience of the battle (rather than the subsequent Japanese occupation) can be done, as almost all of those who experienced the Battle as adults passed away. However, those who experienced it as children still contributed some valuable insights, as will be discussed below.

13 Kwong, *Hongkongers in the British Armed Forces*.

14 For example, many of the Japanese archival sources about the Battle are digitized by the Japan Center for Asian Historical Records. Veteran associations such as the Hong Kong Veterans Commemorative Association provide rich sources for the study of the war. For the sources used by the 1941 Project, see: "The Battle of Hong Kong 1941", https://digital.lib.hkbu.edu.hk/1941hkbattle/en/bibliography.php.

15 Anne Kelly Knowles, *Placing History: How Maps, Spatial Data, and GIS Are Changing Historical Scholarship* (Redlands, 2008), 2–7.

Visualizing the 1941 Battle of Hong Kong Through GIS

Historians have been using GIS for different kinds of studies.[16] The approach has also been used to study wars and battles.[17] However, GIS has seldom been used for wars in Asia, especially during modern times. GIS can visualize and reconstruct the battle and the battlefield and help identify and include those who were "missing" in the narratives about the battle by bringing in experiences from different perspectives. GIS also helps contextualize personal stories and experiences often omitted in text-based accounts that focus on reconstructing the events. In addition, as Levi Westerveld and Anne Kelly Knowles point out, it is worthwhile to include the experience of the people in the GIS project as qualitative data because "being able to metaphorically pin some instances to specific place-moments in space-time helps researchers bring contextual knowledge to their analysis, and helps readers or viewers follow one's geo-historical interpretation".[18] Inspired by the scholars who incorporated oral history in archaeology projects, this project includes first-hand accounts of the civilians who endured the battle in different parts of Hong Kong to help make sense of their experiences, which are often overlooked in the narratives about the battle.[19] GIS accommodates these more intimate experiences and

16 Riccardo Bavaj, Konrad Lawson, and Bernhard Struck, *Doing Spatial History* (London, 2022), 3–17, 274–284; Bernhard Struck, Konrad Lawson, and Riccardo Bavaj, *A Guide to Spatial History: Areas, Aspects, and Avenues of Research* (Olsokhagen Publishing, 2021), 89–95; Ching Chi Lin, "Dili zixun xitong zai shixue yanjiu zhong de yingyong" [The Use of GIS in Historical Studies], in *Dangdai shixue xinqushi* [New Trends in Contemporary Historical Studies], ed. C. S. Chiang (Taipei, 2019), 487–538; Alistair Geddes and Ian Gregory, *Toward Spatial Humanities: Historical GIS and Spatial History* (Bloomington, IN, 2014), ix-xv; Richard White, "What is Spatial History?", Spatial History Lab Working paper, accessed 5 April 2024, https://web.stanford.edu/group/spatialhistory/media/images/publication/what%20is%20spatial%20history%20pub%20020110.pdf; Knowles, *Placing History*.

17 Glenn Foard and Tracey Partida, "The Archaeology of Medieval and Early Modern Battlefields in Flanders", *Journal of Conflict Archaeology* 13 (1) (2018): 12–36; Anne Kelly Knowles, Tim Cole, and Alberto Giordano, *Geographies of the Holocaust* (Bloomington, IN, 2014); Thomas J. Nolan, "Geographic Information Science as a Method of Integrating History and Archaeology for Battlefield Interpretation", *Journal of Conflict Archaeology* 5 (1) (2009): 81–104. The most important examples include the Holocaust Geographies Collaborative and Project '44. "The Holocaust Geographies Collaborative", accessed 5 April 2024, https://holocaustgeographies.org/; "Project '44", Canadian Research and Mapping Association, accessed 5 April 2024, https://www.project44.ca.

18 Levi Westerveld and Anne Kelly Knowles, "Loosening the Grid: Topology as the Basis for a More Inclusive GIS", *International Journal of Geographical Information Science* 35 (10) (2021): 2111.

19 Gabriel Moshenska, "Oral History in Historical Archaeology: Excavating Sites of Memory", *Memory Studies* 35 (1) (2007): 91–97.

narratives so that they can be understood in the same spatial and temporal contexts, making it easier for the researchers and viewers to contextualize, empathize, and explain. Using digital methods to portray diversity, ambiguity, and tensions of historical experience helps balance narratives that only focus on frontline actions and combatants and allows the remembrance of diverse historical experiences that transcend grand narratives.

Originally, the intended audiences of this project were secondary school teachers who needed to teach the battle in class. However, as the project progressed, two versions of the interactive map emerged: one simplified version for classroom use and another for more general usage. The second version has been more widely used. The intended audiences are academics who are interested in battles during the Second World War and visualization of historical events, conservationists and urban planners who are involved in the conservation of the war-related built heritages in Hong Kong, and local historians who are more interested in the details of the battle in different parts of the city, as well as relatives of those who had experienced the battle.[20]

Inspirations for this project come from similar GIS-based interactive maps of European wars, such as Project '44, which depicts the ground campaigns in Europe during the Second World War from an operational perspective.[21] Projects similar in nature often either focus on the military structures, such as the Iwo Jima Map created by the Project '44 team, or on the oral and visual records, such as the Hiroshima Archive.[22] The 1941 Project, instead, tries to blend these approaches into a single platform to narrate the battle, showcase the related war ruins, and study the diverse experiences in specific spatial contexts. The underpinning research for this project was done long before the beginning of this project, as members of the research team have been publishing about the battle since the early 2010s.[23] Expectedly, using

20 In Hong Kong, genealogy is a rapidly emerging field particularly among the members of non-Chinese communities that had lived in Hong Kong for generations. The Chinese community has also picked up genealogy in the past decade. For the most influential project of genealogy in Hong Kong, see Gwulo.com.
"Gwulo: old Hong Kong", accessed 5 April 2024, Gwulo.com.

21 "Project '44", Canadian Research and Mapping Association, accessed 5 April 2024, https://www.project44.ca.

22 "Iwo Jima Map", Project' 44, accessed 5 April 2024, http://www.iwojimamap.com/; "Hiroshima Archive", accessed 5 April 2024, https://hiroshima.archiving.jp/index_en.html.

23 An abridged version of the web map is designed to be used as teaching material for junior form Secondary School students (13–15 years old). Kwong Chi Man and Tsoi Yiu Lun, "PB 3 during the Battle of Wong Nai Chung Gap: From the Japanese Sources", *Surveying & Built Environment* 23 (1) (2015): 75–89; Kwong and Tsoi, *Eastern Fortress*; Kwong and Tsoi, *Guduk chinsaau*; Kwong Chi Man, *Loubing Batsei Heunggong Wajik Yingbing* [Old Soldiers Never

GIS-based interactive maps also leads to more nuanced discussions about the military side of the battle.[24]

The Battle of Hong Kong offers a good case study scenario because of the abundance of sources, optimal size, and the condition of the battlefield. Both sides that fought in the battle had relatively complete records of their actions, and the size of the battlefield (approximately 1,100 square kilometres) and the scale of the battle (participants of both sides amounted to about 50,000 men) allowed detailed representation (down to platoons and individual guns and vehicles). Although Hong Kong witnessed extensive redevelopment after the Second World War, many battlefields and war ruins remained accessible. In addition, sources about the human experiences of the battle are available, and many contain valuable geographical data.

The 1941 Project has two primary components: a GIS-based interactive map visualizing the flow of the battle and a georeferenced database about different aspects of the battle (Fig. 1). An interdisciplinary database design that allows researchers to accommodate ambiguous data is crucial for Spatial History projects.[25] To utilize the interactive map and the database to serve the abovementioned purposes, the 1941 Project's interactive map contains 20 categories/layers of data: historical maps (three layers), unit positions during the battle (one layer), structures (thirteen layers), images (one layer), and other features such as war crimes (one layer) and related personal stories and oral accounts (one layer). Different forms of data, such as textual, visual, and other human data, such as recollections, are incorporated into a database, most of which are georeferenced on the interactive map. To reconstruct the battlefield, the research team georeferenced three historical map layers in the GIS: 1) a 1939 1:15,000 map drawn by the Land Survey Office (*rikuchi sokuryō*) of the Imperial Japanese Army General Staff (*sanbō honbu*); 2) a 1941 1:25,000 map prepared by the Land Survey Office with notes added by the Headquarters of the 23rd Army; and 3) a 1945 1:20,000 British War Office map.[26] The first two maps

Die: Hong Kong Chinese Soldiers in the British Forces] (Hong Kong, 2014); Kwong Chi Man. "Reconstructing the Early History of the Gin Drinker's Line from Archival Sources", *Surveying & Built Environment* 22 (1) (2012): 19–36.

24 Kwong, Chi Man. "Reappraising the Battle of Hong Kong: Preliminary Observations from a Spatial History Project", *Canadian Military History* 30 (2) (2021): 1–38.

25 Anne Kelly Knowles, Janine Hillebrand, Paul B. Jaskot, and Anne Kelly Walke, "Integrative, Interdisciplinary Database Design for the Spatial Humanities: The Case of the Holocaust Ghettos Project", *International Journal of Humanities and Arts Computing* 14 (1–2) (2020): 64–80.

26 Following the battle, the British noted that Japanese troops carried "1:20,000 maps" to the battle; the British were probably referring to the Japanese maps used in this project. Military Attaché Chungking to War Office, 26 January 1942, The National Archives, Kew, London (hereafter TNA), WO 106/2420A.

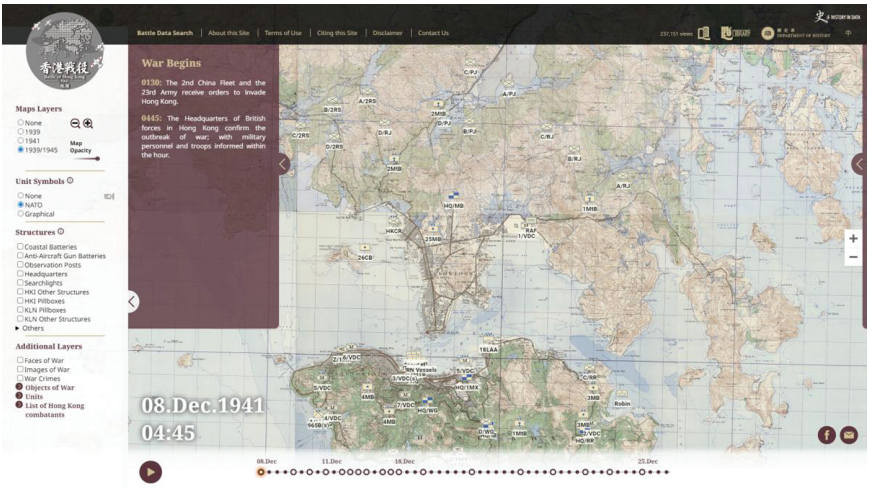

FIGURE 1 The general layout of the system; from right to left: main menu, event box, time and timestep control (bottom); information box (folded up)

contained Japanese annotations of the presumed British defences in Hong Kong and information concerning the city's infrastructure, offering insights into the Japanese understanding of the situation before the invasion. The third map was produced in 1939, with a new grid system added in 1945. None of the maps completely reflected the situation in Hong Kong as of December 1941, and they contained minor variations in the urban part of the city, where rapid changes were witnessed because of the ongoing urban development before the war. As the maps may not contain all the details of streets and buildings during the battle, the research team included a data layer titled "Images of War", which currently contains 83 georeferenced wartime perspective photos so that viewers can have additional visual aids when conceptualizing the battlespace.[27]

The research team then included data concerning the historical structures of the battle by combining archival sources, post-war aerial photographs, field records, post-war memories, and contemporary works. Sources used include the Defence Schemes of 1939 and 1941, which contain map coordinates for many defensive structures.[28] As for the structures without map coordinates,

27 Link to "Images of War" layer: "Images of War", The Battle of Hong Kong 1941: A Spatial History Project, accessed 5 April 2024, https://digital.lib.hkbu.edu.hk/1941hkbattle/en/view.php?page=Historical+Photographs.

28 Interim Defence Scheme, c. 1939, TNA, WO 106/2379; Hong Kong Interim Defence Scheme, 1941, Museum of Coastal Defence Collection.

the research team compared textual and visual sources to determine their locations. For example, the research team located British pillboxes of the Gin Drinker's Line from a Japanese sketch map of January 1942, aerial photos, and secondary studies.[29] Subsequently, more precise locations and details, such as the facing and the number of loopholes of each pillbox, were acquired through fieldwork (Fig. 2–4). The research team organized the static structure entries into data layers such as Coastal Gun Batteries, Anti-Aircraft Gun Batteries, Observation Posts, Headquarters, Searchlights, Pillboxes, Communications, and Auxiliary Defences that include minefields (as polygons and lines), boom

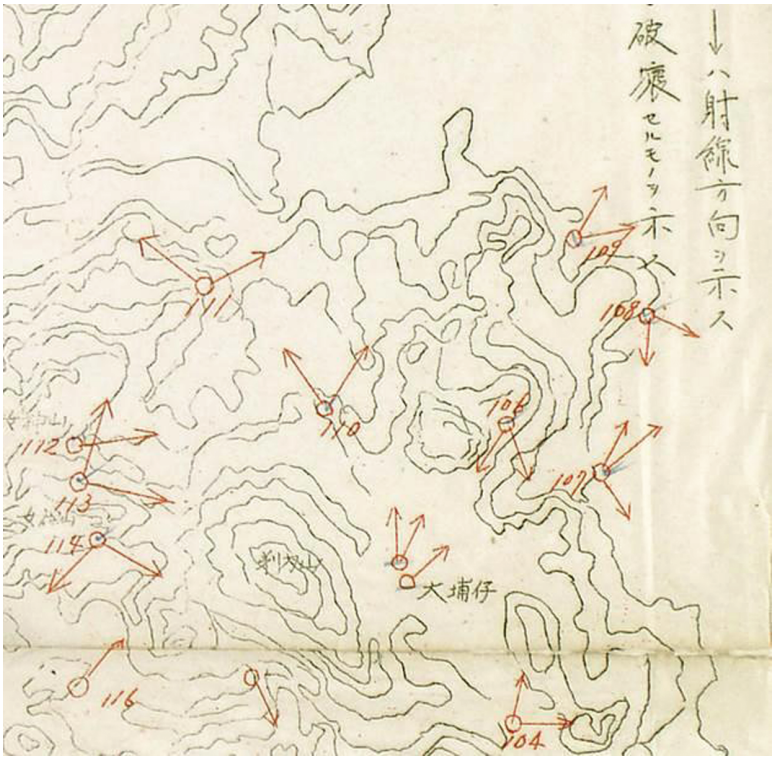

FIGURE 2 Japanese sketch maps of British positions near Sai Kung[30]

29 Rob Weir, "Researching Hong Kong Pillboxes: The Hard Way", *Survey & Built Environment* 30 (1) (2021): 107–119.

30 Honkon bōgyo shisetsu-zu, Department of Geography, Ochanomizu University; "Kyūryū hantō okeru honbōgyo jinchi chōsa hōkoku" [The Study of the Main Defensive Position on the Kowloon Peninsula], January 1942, Shina-Dai Tōasen-Nanshi 90 [China-Greater East Asia War/the Pacific War- South China], National Institute for Defense Studies Archive, Tokyo.

FIGURE 3 Aerial photo of a British pillbox (PB 106, in red box) near Port Shelter, taken in 1963[31]

defences (as lines), and pre-arranged artillery targets. While most of these categories are self-explanatory as they are named after their function, some are organized as "Other Structures", such as barracks, field hospitals, shelters, administration pools, vehicle depots, and landmark structures requisitioned for military use (mainly as emergency hospitals). Although some structures appear on the map as individual structures (such as pillboxes), some are organized into single entries according to their operational function, such as coastal batteries with several guns. There are currently a total of 722 entries under the fixed structure layers (Table 1).

To visualize the flow of the battle and the movement of the military units, the research team divided the battle into 51 animated "timesteps", each representing a specific time during the battle. The intervals of the timesteps vary according to the dynamics of movements and actions. Certain intervals can be as long as one day, while others are as short as 2–4 hours (Table 2). Users can "play" the timesteps as if it is an animated map or "freeze" a timestep to study the situation during a particular phase of the battle. The research team then created a data layer of "units" that shows the flow of the battle. The sources used to construct this layer include war diaries, eyewitness accounts,

31 Lands Department and Hong Kong Geodata Store via the Battle of Hong Kong 1941: A Spatial History Project: "The Battle of Hong Kong 1941", https://digital.lib.hkbu.edu.hk/1941hkbattle/en/map.php.

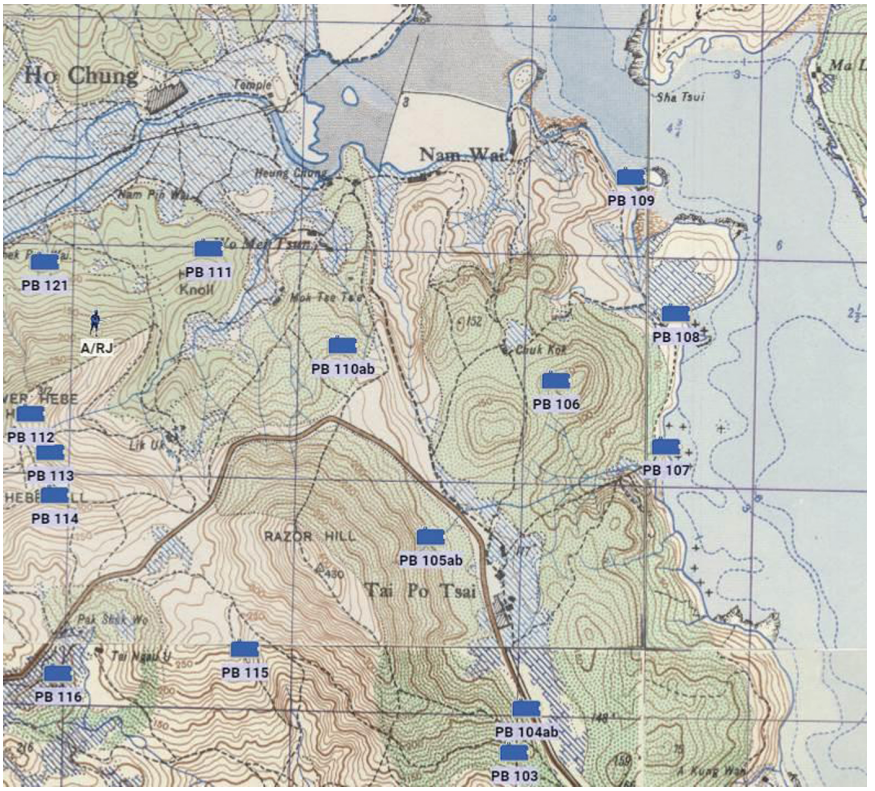

FIGURE 4 The position of the British pillboxes near Port Shelter on the interactive web map[32]

and unit histories. A certain degree of abstraction is adopted, as it is impossible to locate individual men during a battle that involves over 50,000 men and numerous military hardware. For the land forces, units down to the company and platoon levels are shown, thus showing the complexity of the movement of both sides. Additional qualitative data, such as commanding officers or the status of the unit, are provided using text boxes. Naval and aerial actions are more abstracted on the interactive map, as ships and aircraft are represented individually or as squadrons, and only their approximate positions are shown. In all, over 7,000 Points of Interest/Features (POIs) about unit positions were included on the map.

As Jeremy Black suggested, while maps effectively inform the public about the progress of wars, they convey a simplified understanding of the situation at

32 "The Battle of Hong Kong 1941", https://digital.lib.hkbu.edu.hk/1941hkbattle/en/map.php.

TABLE 1 Attributes of a Static Structure Entry

Categories	Value	Descriptions
ID	FS00264	FS stands for Fixed Structures; a four-digit ID is assigned so that it can be searched by the search engine and cross-referenced with other entries, which amounted to 697 entries.
Group	KLN Pillboxes	Entries of the same group will appear as the same layer
Name on Map	PB 106	Name that appears on the web map
Name	PB 106	Name that appears in primary sources and their Chinese translation
Type	Pillbox	The type of structure under the British military nomenclature
Built Year	1936–1938	The year when the structure was built
Location	Chuk Kok	The general area of the entry
Latitude	22.344716	The specific location of the Points of Interest/Features (POI); sometimes abstracted as one POI for a group of structures with the same purpose (a battery that consisted of multiple guns deployed close by)
Longitude	114.26163	Ditto.
Icon Image	BR_PB.png	The filename of the icon that appears on the web map
Photo Filename(s)	—	Filenames of the photos shown in the message box that contains the description
Description	Embrasure x 2 facing southeast and southwest	Descriptions of the configuration and physical conditions of the structures
Sources:	*Omitted here*	Divided into sources of location and photo credits
Link:	—	Links to other entries.

TABLE 2 Samples of the Attributes of a Timestep

ID	Date	Start Hour	End Hour	Interval
EV0001	1208-0	1941-12-08 04:45*	1941-12-08 07:59	3 hrs 14 mins
EV0002	1208-1	1941-12-08 08:00	1941-12-08 14:59	6 hrs 59 mins

*The time when the British garrison in Hong Kong received the news about the outbreak of the war.

the front.[33] The recent war in Ukraine has also seen the proliferation of using GIS to present the changing situation of the war, but often, they are simplified to the extent that they convey wrong impressions of the war's progress.[34] Even with the help of GIS and other geospatial technologies, one cannot fully reconstruct the battlefield and visualize the battle, and gaps in knowledge exist. The problem of objectivity in cartography is also a noted issue among historians engaging in Spatial History.[35] Another potential problem of using geospatial and visual methods to curate a battle is the potential of creating an illusion of clarity or even a "sanitized" depiction of a battle. Static maps about the Battle of Hong Kong often presented the battle in a simplified manner because otherwise they would be too difficult to read. For example, the Canadian official history of the battle contains a much-simplified map (Fig. 5).[36] On the other hand, the Japanese maps drawn soon after the battle were difficult to comprehend as the staff officers attempted to include every unit and their movements on the map (Fig. 6).[37]

33 Jeremy Black, "Presenting the Modern World for the American Public: Maps and Public Education in World War II", Foreign Policy Research Institute website, accessed 5 April 2024, https://www.fpri.org/article/2018/07/presenting-the-modern-world-for-the-american-public-maps-and-public-education-in-world-war-ii/.

34 Timothy Barney, "Maps Show – and Hide – Key Information about Ukraine War", The Conversation, 21 March 2022, accessed 5 April 2024, https://web.stanford.edu/group/spatialhistory/media/images/publication/what%20is%20spatial%20history%20pub%20020110.pdf.

35 Struck, Lawson, and Bavaj, *A Guide to Spatial History*, 77–87.

36 Charles P. Stacey, *Official History of the Canadian Army in the Second World War: Vol. I Six Years of War* (Ottawa, 1956).

37 See 'Honkon kōryakusen sentō keika yōto' [Map Showing the Operations Concerning the Invasion of Hong Kong], December 1941, Rikugun ippan shiryō [General Historical Materials of the Army], Japan Centre for Asian Historical Records (hereafter JACAR), Ref: C13031840400.

GIS-based interactive maps do better in presenting the complexity of the battlefield, but not without potential problems. They offer a higher degree of clarity than static maps, as they can be zoomed in and out so that viewers can choose the level of granularity to data, and details of the maps can be easily seen. Moreover, interactive maps can incorporate the time element and unit movements on a single screen, unlike printed maps that only show changes using static arrows or multiple maps (Fig. 5–7). Different data layers, such as unit positions or static structures, can be viewed together or separately so that the viewers can obtain a more nuanced understanding. On the other hand, however, interactive maps may give the viewers a false sense of clarity to the extent that they overlook the chaotic nature of the battle and the confusion facing the combatants due to terrain, physical barriers, communication difficulties, and the fog of war. To address this issue, the research team decided to omit the "frontlines" or "areas of control", common features of war-related maps, and allow units to congregate in a small area without any visual intervention as they reflect the chaotic nature of the battle. This is because the Battle of Hong Kong was fought over mountainous and broken terrain, where

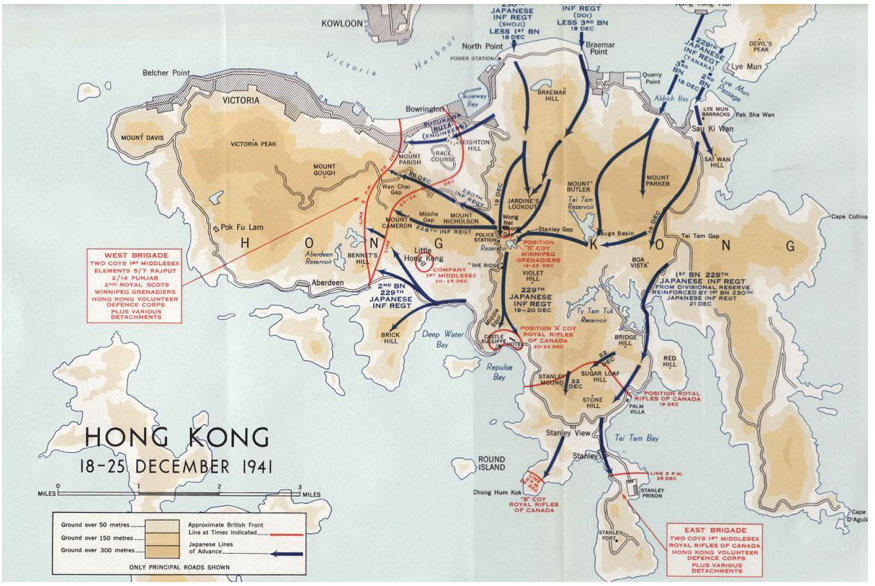

FIGURE 5 Map from *Official History of the Canadian Army in the Second World War*[38]

38 Stacey, *Official History*.

FIGURE 6 Japanese Army's map of the Battle of Hong Kong[39]

units fought separate (and sometimes related) actions, while the front was non-existent, and the areas of control were constantly in flux. Concentrations of unit counters/icons can almost always reveal the primary efforts or where heavy fighting took place. However, unlike a printed map, the user can always zoom in and out for more clarity or "play" the timeline to see the flow of the battle. The team also included "thick descriptions" of events in the interactive maps by adding textual sources, oral history records, and photographs.

Showcasing, Contextualizing, and Explaining the Diverse Human Experiences in Combat

GIS allows researchers and readers/viewers to dive deeper into the diverse human experiences in a battle. Military historians have always tried

39 'Honkon kōryakusen sentō keika yōto' [Map Showing the Operations Concerning the Invasion of Hong Kong], December 1941, Shina-Dai Tōasen-Nanshi 77 [China-Greater East Asia War/the Pacific War- South China], National Institute for Defense Studies Archive, Tokyo.

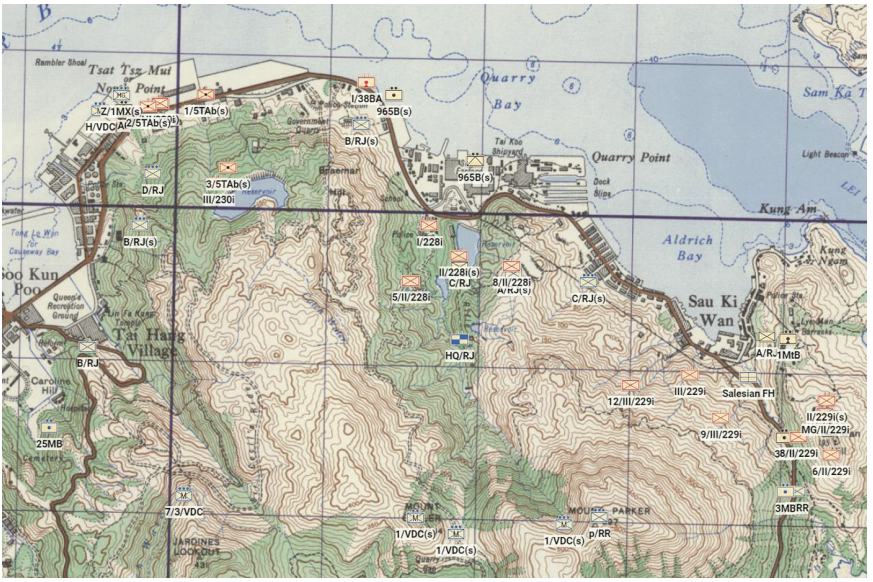

FIGURE 7 Japanese companies on the northeastern shore of Hong Kong Island, the evening of 18 December 1941 (Military units on the interactive web map are in standard NATO symbols)[40]

incorporating the participants' voices in their studies.[41] Spatial History scholars, meanwhile, also try to accommodate more qualitative data in their projects.[42] To move beyond the portrayal of the Battle of Hong Kong as an exclusive affair between the British and the Japanese armed forces, the research team has currently included 97 entries of wartime experiences from people of different backgrounds as a map data layer named "Faces of War". The entries include frontline soldiers, rear-area personnel, civilians, and people of varying ages, genders, and ethnicities. Among the individuals and groups covered by the project are British, Chinese (from Hong Kong, China, and overseas), Japanese, Indians, Canadians, Russians, Eurasians, Americans, Jews, Australians, Vietnamese, French, Czechs, and others. In terms of gender, there are 86 men and ten women. Regarding their status, there were 36 civilians and 61 combatants. Among the 97 stories, the bilingual interview transcripts of 12 of them are included in the map, of which 11 are civilians. As more stories

40 "The Battle of Hong Kong 1941", https://digital.lib.hkbu.edu.hk/1941hkbattle/en/map.php.

41 For example, see John Keegan, *Face of Battle: A Study of Agincourt, Waterloo and the Somme* (London, 2004), 32–33.

42 Westerveld and Knowles, "Loosening the Grid", 2109–2111.

are included, it is hoped that the imbalance in voices between ethnicity and gender will be further addressed. The research team assigned one geographical location for each personal story, usually the most important event of the individuals' experience, such as a particular action or, in some cases, where they were killed.

The advantage of this approach is that together with the detailed unit information on the map, the experience of the previously "missing" participants of the battle, such as non-European service personnel, civil defence members, and civilians, can be "seen" alongside that of the commonly known figures (notably the British, Canadian, and Japanese officers). The best example would be that of the Battle of Wong Nai Chung Gap, where previous narratives usually focused on some selected groups of British, Canadian, or Eurasian servicemen. The role and experience of the local servicemen, such as the Chinese sappers and Indian gunners, which were almost always omitted in the accounts about the events in the area, are not only shown but also put in the larger context. In addition, the ethnic, cultural, and class diversity of the British Commonwealth garrison can also be easily visualized: in the general vicinity of Wong Nai Chung Gap the research team included a Canadian brigadier, sergeant, and signalman, two Eurasian Volunteers, a Hong Kong Chinese sapper, an Indian gunner, a British gunner, an American private who joined the Canadian forces, and an American writer who visited the battlefield soon after the surrender of the garrison (Fig. 8).

Another example would be the Portuguese service personnel whose experiences were usually omitted in the textual narratives focusing on frontline actions. During the battle, the Portuguese servicemen were organized into No. 5 and No. 6 Companies, Hong Kong Volunteer Defence Corps. They were dispersed in the built-up area of the island and served as anti-aircraft machine gunners; thus, they saw little frontline fighting except being bombed and shelled throughout the battle or engaging Japanese aircraft. The experience of Arthur Gomes, a Portuguese soldier from No. 5 Company, who was haplessly bombed and shelled throughout the battle, was very different from those who fought at the front. However, war narratives usually omitted his experience because men like him did not participate in the heavy fighting in other parts of the Island.[43]

Similarly, women and children have been largely omitted in narratives about the battle except when they were victims of the atrocities. To address

43 His entry in the interactive map: "Arthur Gomes", The Battle of Hong Kong 1941: A Spatial History Project, accessed 5 April 2024, https://digital.lib.hkbu.edu.hk/1941hkbattle/en/data.php?show=item&id=FW00095.

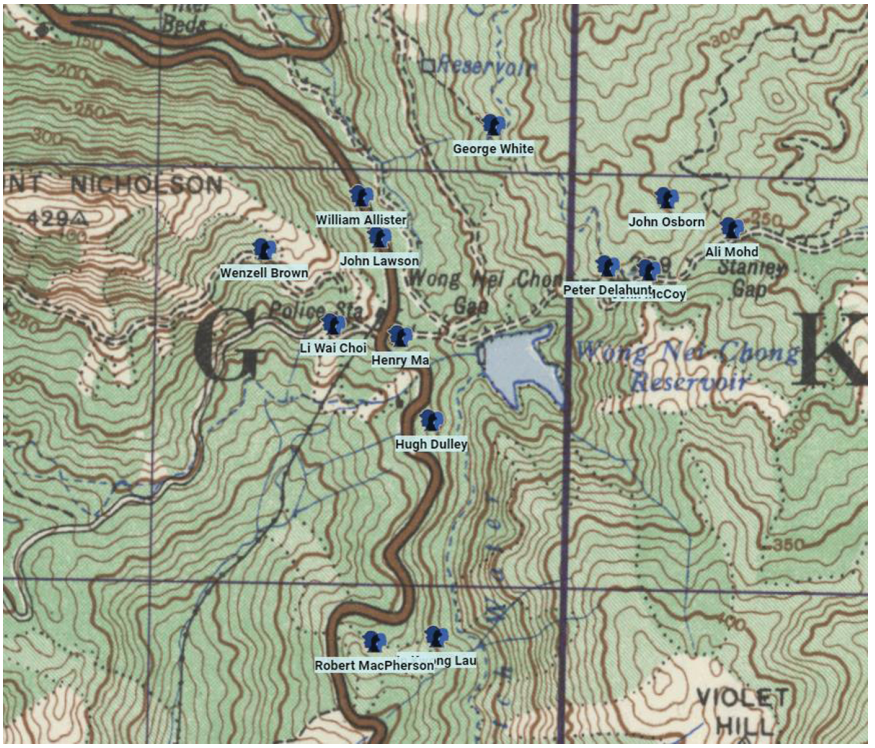

FIGURE 8 The "Faces of War" layer of the 1941 Battle of Hong Kong Interactive Map

this imbalance of portrayal, the interactive map includes the accounts of eleven women and children of different ethnicities. They experienced the war in different parts of Hong Kong. Among the women included, two were nurses, two served as Air Raid Precaution Wardens, one was a Navy, Army, and Air Force Institute clerk, and five were civilians.[44] This is to show the participation of women in the conflict not only as civilians but also in many other supporting roles, a reflection of the context of the total war experience of the Second World War. While a textual account can also cover these figures, GIS provides a quick way to visualize where they participated in the events so that their experiences can be understood in context. This method is especially useful for our case because Hong Kong's complex landscape and urban environment witnessed substantial redevelopment after the war. Moreover, it builds upon the existing studies on the battle by including the multiethnic and gender perspectives.

44 Their entries in the interactive map: "Stories", The Battle of Hong Kong 1941: A Spatial History Project, accessed 5 April 2024, https://digital.lib.hkbu.edu.hk/1941hkbattle/en/view.php?page=Stories.

GIS also helps us better understand previously scattered and sometimes garbled sources by putting them in spatial and temporal contexts. As Ian N. Gregory noted, HGIS may not always explain the pattern it can visualize, and historians' interpretation and explanation remain crucial.[45] For those who experienced the battle, especially the non-combatants, it was a confusing and messy affair, and understandably so because of their inability to receive any reliable and updated information for the duration of the war and perhaps even after that. As shown below, many oral history records about the people's experiences during the battle were difficult to understand without being contextualized in the physical space and the more significant events. Thus, including oral history data in Spatial History/HGIS projects helps verify and contextualize the civilians' voices in war. This can be a difficult task because of the fragmented nature of the survivors' memory and because some survivors were too young to comprehend their traumatic experiences. These personal records also contain factual errors in time and space. Thus, they must be examined alongside other data layers of the interactive map.

For example, the villagers of Pok Fu Lam Village had a confusing experience during the battle. The village was in a considerably fortified part of Hong Kong Island, situated next to the coastal defence forts on Mount Davis and the anti-aircraft battery at Waterfall Bay. Next to the village were pillboxes and shelters for the defenders around the Pok Fu Lam Reservoir. Although the area saw little fighting, it witnessed some military activities as it was first garrisoned by a mixture of Canadian, British, and local troops and then briefly became the logistics centre of the garrison. One villager, who was nine when the war started, recalled in an oral history interview:[46]

> On 8 December 1941, the day of Immaculate Conception, if I remember correctly, an alarm suddenly sounded … everyone was shocked. The sound of the guns was tremendous … the guns at Wah Fu Estate … there were two anti-aircraft guns. They produced a thundering sound when they opened fire, and (the shock wave) tore open the hinges of the doors and windows of Taikoo Lau (Swire Building). The tremendous banging sound of the guns shocked the grandfather of _____ to death – he was very old. I cannot describe how loud the sound of the anti-aircraft guns was. The sound could scare you to death …

45 Ian N. Gregory, "'A Map is Just a Bad Graph': Why Spatial Statistics are Important in Historical GIS", in *Placing History*, ed. Knowles, 126.

46 Ho San Pui's account: "Ho San Pui", The Battle of Hong Kong 1941: A Spatial History Project, accessed 5 April 2024, https://digital.lib.hkbu.edu.hk/1941hkbattle/en/data.php?show=item&id=FW00055.

The research team helped the social workers and villagers who tried to curate the local history through guided tours to verify these oral records and put them in larger spatial contexts even though the environment was almost completely rebuilt. The anti-aircraft gun battery, now demolished and became a bus terminal, was located 400m from the Swire Building, which was torn down to make way for a housing estate.[47] Although the villager's account was incorrect in the number of anti-aircraft guns (one instead of two), the account is largely accurate. The additional information from the interactive map allowed the users to examine the sources (this time oral history records) to spot errors. In this case, the villagers who had not experienced the war incorporated this part of history in their placemaking process so that the public could appreciate the history of their village. The project helps the villagers record their ancestors' past, which was hitherto seen as too confusing or lacking contextual information.

Including biographical data such as oral history records in GIS makes it easier for military historians to discern whether certain personal events/occurrences are common or unique, with a degree of certainty that may be difficult to obtain through textual studies. This helps avoid individual cases or rate occurrences being misrepresented or overinterpreted. For example, in an oral history interview done during the early 2000s, Tang Tak Ming, a man who lived in Wanchai, a densely populated working-class district, recalled that his father was killed as his family home/workshop was destroyed during the Japanese shelling of the Island. He recalled:[48]

> On 18 December 1941, a bomb exploded near our shop. Although the bomb did not directly hit our shop, the shockwaves from the explosion caused our shop to collapse. At that time, most people lived in wooden houses (brick houses with wooden frames) about three stories tall, and just 3–4 bombs dropped on a street would cause the houses to collapse …. We did not have time to get to the air raid shelter, and although we heard

47 Waterfall Bay Anti-Aircraft Gun Battery: "Waterfall Bay AA Battery", The Battle of Hong Kong 1941: A Spatial History Project, accessed 5 April 2024, https://digital.lib.hkbu.edu.hk/1941hkbattle/en/data.php?show=item&id=FS00021.

48 Tang Tak Ming's entry in the interactive map: "Tang Tak Ming", The Battle of Hong Kong 1941: A Spatial History Project, accessed 5 April 2024, https://digital.lib.hkbu.edu.hk/1941hkbattle/en/data.php?show=item&id=FW00096; Lau Chi Pang and Chow Ka Kin, eds., *Tunsheng renyu: Rizhi shiqi xianggangren de jitihuiyi* [Swallowing Up Voices and Refrain to Speak: Hongkongers' Collective Memory during the Japanese Occupation] (Hong Kong, 2010), 161–162.

FIGURE 9 Georeferenced Photo of the Wanchai Area (Red Arrow points to the ruins of Tang's family home)

> the bombs, we did not dare go outside to check, afraid of being hit by bomb fragments. We all hid under the machines, and after the shop collapsed, our whole family and the shop assistants were buried under the debris, unable to move. We were buried for almost 2 hours, until after the air raid siren was stopped and the firefighters came to rescue us …. Later, we found out the Japanese had wanted to bomb the fire station because a British flag was flying there, but they ended up collapsing our building instead. Being buried alive was a horrifying experience; my mother held my hand the whole time. Luckily, the bombs dropped were not incendiary bombs. Otherwise, we surely would have died in the wooden building.

The chief-of-staff of the Japanese division that invaded Hong Kong maintained that the Japanese forces refrained from shelling the densely populated areas on Hong Kong Island to avoid civilian casualties.[49] Although the site where Tang lived was redeveloped entirely, the research team could use GIS to georeference aerial photographs taken after the battle and find out his residence.

49 Defense Agency National Institute for Defense Studies Military History Department, Honkon-Chosa Sakusen, *Hong Kong-Changsha Operations* [Official History of WWII compiled by the Ministry of Defence, Japan] (Tokyo, 1971), 87.

The result shows that his family home was one of the few houses damaged during the fighting and possibly the only one that collapsed (Fig. 9). This indicates that Tang's experience was the result of chance rather than the result of any large-scale bombardment of the built-up area by the Japanese forces. Of course, however, one needs accurate geospatial data that is difficult to come by in the Asian context, in this case, aerial photographs, to have a detailed discussion.

The project also allows researchers to incorporate the civilians' recollections and appreciate their emotions and feelings that are difficult to fit into narratives focusing on frontline actions. GIS-based interactive maps help preserve and show this kind of primary source and allow it to be visualized in a spatial context. For example, the project team received the unpublished memoir of Poon Kwong Leung, a man who lived in Hong Kong from 1927 to 1991. In his passage about the battle, he noted that he was stranded in Kowloon while his wife and children were on Hong Kong Island, as well as the horror of witnessing the chaos during the fall of Kowloon:[50]

> At that time, I was in Mong Kok observing the situation from the rooftop of the Shoe Workers' Union, witnessing the terrible scenes of thugs looting shops and the atrocities committed by the invading enemy forces unfold before my eyes. On the 13th, the Kowloon Peninsula was overrun. They sent planes to bomb the ammunition depot at Stanley, with smoke billowing high into the clouds. They also fired artillery over the hills to strike the British positions in the southern part of Hong Kong Island, leaving thick piles of smoke lingering behind the mountains. The West Point and warehouse area was lit by raging fires, with deafening artillery blasts striking terror into the human world.
>
> When the war broke out, and chaos reigned my wife and I were separated and lost contact [on both sides of Victoria Harbour], filled with endless longing and worry for each other. Five days after fighting ceased, the ferry service remained suspended, and travel between Hong Kong and Kowloon was prohibited. Eager to reunite, I went to Stonecutters Island, gathered a few people, and, at great expense, hired a small boat to smuggle me across the harbour. Braving the terrifying winds and waves for nearly an hour, I finally arrived safely ashore at the Sai Ying Pun fish market.

50 Poon Kwong Leung's account: "Poon Kwong Leung", The Battle of Hong Kong 1941: A Spatial History Project, accessed 5 April 2024, https://digital.lib.hkbu.edu.hk/1941hkbattle/en/data.php?show=item&id=FW00097.

> The journey was bleak and desolate. The seaside warehouses were still smouldering ruins. The smell of gunpowder lingered heavily in the air. The Western district was not a military target, so it did not suffer major destruction. Though traumatized by the terror, my wife and child were fortunately unharmed. Our reunion felt like two lifetimes apart. Alas! My wife returned to Hong Kong for refuge, thinking it would be safe, but history repeated before we could catch our breath.

Between 13 and 18 December, the Japanese forces deployed artillery units in Kowloon (where Poon Kwong Leung stayed) and shelled Hong Kong Island (where Poon's family lived). Reading this account alongside the interactive map, one can better appreciate the specific spatial context of the pain the Poon family suffered when they were separated by Victoria Harbour, just as the British and Japanese forces were shelling across the Harbour.

With the help of GIS, one may find it easier to investigate and contextualize individual experiences, even if the sources are specific on location but not time. For instance, Lee Sung, a medical doctor who lived in Happy Valley and served in a first-aid post in Wanchai Market during the battle, had a detailed account of his experience towards the end of the battle, when he inadvertently crossed the firing line near Wanchai twice and survived with light injury. Although he left a detailed account of his experience with the names of the places, he only included a rough estimate of the time of his experience.[51] The lack of specific time data makes it impossible for the research team to visualize his movement alongside the actions in the area, even though his account broadly fits the situation between 24 and 25 December 1941. Thus, the research team can only place his story at a single point rather than attempt to reconstruct his movements in the GIS. The result is a flat presentation of his experience through text, although placing his experience in the spatial context can still help readers link his experience with the surrounding events.

Similarly, GIS may also accommodate and contextualize the "myths" that were being circulated at that time so that the spatial background of those myths could be better understood. The best example of such a group is the "Wan Chai Angels", a group of local partners of British servicemen who helped the garrison during the last days of the siege.[52] Information concerning their

51 Lee Sung's account: "Lee Sung", The Battle of Hong Kong 1941: A Spatial History Project, accessed 5 April 2024, https://digital.lib.hkbu.edu.hk/1941hkbattle/en/data.php?show=item&id=FW00078.

52 Angels of Wanchai's entry: "Angels of Wanchai", The Battle of Hong Kong 1941: A Spatial History Project, accessed 5 April 2024, https://digital.lib.hkbu.edu.hk/1941hkbattle/en/data.php?show=item&id=FW00073.

FIGURE 10 The War Crimes data layer: https://digital.lib.hkbu.edu.hk/1941hkbattle/en/data.php?show=list&find-in=War%20Crimes (accessed 5 April 2024)

background and activities is very limited, except that they were active at Wan Chai. As Westerveld and Knowles noted, historians sometimes have to confront the problem of not having enough sources to "fit" a story in a coordinate point on the GIS.[53] The incident was mentioned in the regimental history of the Royal Scots, who were garrisoned at Murray Barracks close to Wan Chai, where the garrison held the last line of defence before the surrender. Before the war, some Royal Scots soldiers married the locals, while others kept their partners in Wan Chai.[54] The GIS-based interactive map helps contextualize these obscure encounters and relationships and partly explains the existence of the "myth" about the Wan Chai Angels. Moreover, the inclusion of the Wan Chai Angels in the interactive map highlights the need to cover the experience of the underprivileged groups or those who could not tell their own stories during a conflict between modern states, even though these experiences and stories should not be taken at face value due to the lack of documentary evidence and the fact that they were usually not recounted by the underprivileged themselves.

53 Westerveld and Knowles, "Loosening the Grid", 2109.

54 Philip Bruce, *History Notes: Hong Kong*, Vol. 1 (Hong Kong, n.d.).

GIS also helps the research team explain the diverse human experiences by visualizing distance and terrain in ways that are difficult to do in textual studies; for our study, it puts events such as atrocities of war in perspective. During the battle, Japanese soldiers murdered surrendered Allied personnel and civilians in different parts of the city, especially on Hong Kong Island. The interactive map includes all ten major war crime cases as a map layer (Fig. 10), and each entry contains the details of the atrocities and the victims and the first-hand accounts of the survivors, some of whom testified against the perpetrators after the war. The layer included well-known cases such as the St Stephen's College massacre, during which dozens of medical personnel, wounded soldiers, and civilians were killed and several nurses raped, as well as more obscure cases such as the killing of Chinese Nationalist officials and civilians along Blue Pool Road.[55] By examining these war crime cases in spatial contexts, one can better understand the circumstances behind each case. Moreover, it reminds the viewers that the battle was not only about combat actions between two well-defined forces but also about very confusing events and brutal atrocities in which the human experience should be highlighted.

After placing the locations where the killing of prisoners and civilians occurred, one can see that many of these cases took place along the path of the same units, namely the 2nd and the 3rd Battalion, the 229th Infantry Regiment. These two battalions were responsible for killing surrendered British and Commonwealth soldiers in Sai Wan Battery, Salesian Mission, Wong Nai Chung Gap, the Ridge, the Overbays, Eucliffe, St Stephen's College, and Brick Hill. This pattern contrasted with the other two Japanese infantry regiments (that had six battalions) participating in the same campaign. If one relied on the textual narratives of these events, it would be difficult to identify the unit that perpetuated them. As Suzannah Linton suggested, the troops' identity in the atrocities was a "critical factor in the acquittals that were secured by the Defense" during the war crime trials held following the war against the commander of the 229th Regiment, who was imprisoned for ten years but avoided heavier penalties.[56] In almost every instance, the killings occurred when the troops from the 229th Regiment were quickly moving from one place to another. Usually, the troops captured in these instances were isolated from the main body of the garrison. On the other hand, the other two regiments (228th and 230th) were stuck in the middle part of the Island, and they were

55 An example can be seen here: "Salesian Mission", The Battle of Hong Kong 1941: A Spatial History Project, accessed 5 April 2024, https://digital.lib.hkbu.edu.hk/1941hkbattle/en/data.php?show=item&id=WC00008.

56 Suzannah Linton, *Hong Kong's War Crimes Trials* (Oxford, 2014), 100.

connected with rear-area troops who could handle the prisoners of war. In contrast, the hundreds of Commonwealth prisoners of war captured on the northeastern part of the Island by these two regiments did not face the fate of their colleagues in the abovementioned area. The attempts to explain these atrocities through a spatial perspective are not to absolve the killings or attribute it solely to geography or chance; the lack of training in international law and the way the Japanese soldiers were trained also partly explained the occurrence of these killings.

However, this case also shows the limitation of only using GIS to explain these events. While the GIS-based interactive map provides the spatial contexts of individual cases and allows the viewer to link the war crime cases with the units that perpetuated them, it cannot show many other factors that can be crucial for these events, such as the impact of the use of violence in the soldiers' training, the lack of knowledge among the junior officers and the men, the problems of communication and translation, the absence of more senior officers who may prevent these events, emotions, and other circumstantial factors that may contribute to different outcomes. For example, it is impossible to only use the map data to explain the rampage of the Causeway Bay area by the Japanese troops after the British surrender, during which Japanese troops looted and raped the local population.[57] Thus, while GIS can bring new insights into the study of events, especially by highlighting the role of space and distance, one should not overlook other factors that cannot be seen or placed on maps.

Conclusion

GIS-based interactive maps can potentially transform the study of military history as they help bridge the gaps between the studies of history, built heritage, and the diverse human experiences in wars. By bringing together primary sources about the battle into a single database, this kind of project can offer a nuanced view of an otherwise chaotic event and potentially new ways to revise its history. A major divergence between a monograph and a database-based interactive map is that the latter can be constantly corrected and updated with newly available data. This allows a systematic accumulation of data about a battle that allows the changing curation of the battle over

57 Link: "Causeway Bay", The Battle of Hong Kong 1941: A Spatial History Project, accessed 5 April 2024, https://digital.lib.hkbu.edu.hk/1941hkbattle/en/data.php?show=item&id=WC00002.

time. The visualization element, in the form of a 2D GIS-based interactive map for this project, can be further enhanced with the advancement of visual technologies ranging from 3D digital terrain models to augmented reality and virtual reality. Different visualization strategies can be employed so that the data curated in this kind of project can be used for different purposes, from academic research to museum curation and battlefield tours. Visualization also enabled users (researchers and general viewers alike) to crosscheck different sources and to spot errors contained in data by putting them together and examining them against the physical and human contexts. A similar platform can bring the interviewers and interviewees during oral history interviews back to the temporal and spatial contexts.

Our case shows that it is particularly useful in an Asian urban setting, where post-war redevelopment has erased the pre-war urban environment, and primary sources about the wars are less well organized and more fragmented. The GIS-based interactive map about the Battle of Hong Kong facilitates the study of a battle from multiple perspectives; it allows researchers to obtain new insights about the battle by making connections that were previously difficult to identify; it enables historians and geospatial specialists to combine their efforts to document and contextualize the war-related built heritage, events, and human experiences; and through the incorporation of biographical data, the interactive map offers new ways to approach the battle by visualizing the diverse human experiences and link them to different spatial and temporal contexts.

However, using a GIS-based interactive map to visualise a battle has limitations that future researchers must consider. The method risks conveying a sanitized portrayal of war if the creator is unaware of the chaotic nature of fighting. It may also reinforce the impression that the battle only involved two clearly defined opposing forces. Moreover, it is the creator's responsibility to include diverse voices, especially those of non-combatants from different backgrounds in such a platform, especially if a battle occurs in an urban setting where people from many different backgrounds congregate. As the cases illustrated in this paper show, GIS cannot fully overcome the problems facing other methods, namely fragmented accounts or sometimes a complete lack of sources concerning the more obscure actors in history, even though it provides a platform to integrate the scattered information available. Using GIS to curate human experiences faces the same issues of sources, authenticity, and interpretation, just as using it to study a battle from a military history perspective. As such projects use numerous primary and secondary sources, they may give a sense of authority that leads to easier spread of errors or biases.

Moreover, GIS can help explain and contextualize events and experiences so that rare cases do not over-represent the norm and patterns can be explained spatially. However, despite its ability to visualize the flow of a battle, it can only make it easier for historians to curate and interpret but not displace the role of narratives. As our discussion of the war crimes committed by the Japanese forces shows, while the maps may give new insights as to the causes of certain events, there are other factors that cannot be depicted on the maps, and they have to be taken into account. Thus, while the project facilitates the preservation and dissemination of the findings of community members and helps sustain the diversity of narratives about the battle, historians have to remain conscious of the potential pitfalls of misrepresentation and overinterpretation.

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