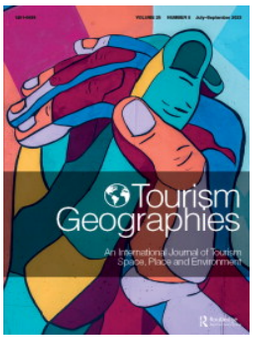

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Gazing from the air: tourist encounters in the age of travel drones

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ABSTRACT

Consumer drones can be increasingly spotted in tourist sites, and arguably the aerial technology has transformed how tourism in Singapore is experienced and represented. This investigation explores in empirical detail how the videomaking practices of DroneTubers contribute to the diversification of tourist encounters. Based on evidence from ethnographic fieldwork in the Southeast Asian metropolis and on digital platforms, this article maps tourist encounters facilitated by drone tourism and illuminates the formation of a platform ecology for travel drones. In recent years drone videos featuring Singapore's urban landscapes have rapidly gained popularity on YouTube. Drawing on analyses of situated drone practices in Singapore's Marina Bay and its audiovisual representation on digital platforms, this case study demonstrates how the platformization of drone tourism facilitates participatory gazing. This form of gazing made possible a prolonged negotiation of the meanings that the researched travel influencers and their audiences attributed to tourist attractions. The frequent use of travel drones in Marina Bay gave rise to an additional space of representation for the urban landscapes of Singapore. The ethnographic study finds that the videomaking practices of DroneTubers extended the scope of tourist encounters by establishing an everyday lived space where the allure of tourist attractions is negotiated through online co-presence. The findings of the study call into question long-standing conceptualisations of tourist encounters as place-bound practices and indicate how drone tourism established new interdependencies among local tourism professionals, tourists and platform audiences.

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Introduction

Rahul stands on the edge of the Esplanade Outdoor Stage. It is his last evening in Singapore, and the 32-year-old, Indian travel influencer plans to shoot further drone footage of Marina Bay. As night begins to fall, he slowly takes a drone out of his backpack. Although he has carefully studied a map for no-fly zones in the city-state, he is visibly nervous as flying drones is strictly prohibited in certain inner-city areas.

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Nonetheless, the drone rises into the twilight sky moments later. Attentively following the drone's camera feed playing on the small display on the remote control, Rahul carefully navigates the device throughout the 15-min flight as it records 4K footage. Back in his hotel room Rahul scrolls through the footage on his laptop, and he takes a photo on his smartphone of the video editing software displaying Singapore's skyline. He quickly posts the photo as an Instagram story to announce the production of a new video. The short anecdote about the DroneTuber epitomises a series of local drone practices which allow tourists to temporarily inhabit the aerial space of Singapore.

Drone tourism burgeoned in the latter half of the 2010s. Global sales of small consumer drones, i.e. weighing up to 5 kg, grew from 0.3 billion to 5.8 billion devices between 2013 and 2019 (Han, 2020, p. 6), and concomitantly urban areas with tourist attractions are increasingly traversed by consumer drones. While a multitude of destination marketers seek to attract new visitors by sharing awe-inspiring drone footage on their websites and digital platforms, many contemporary tourists bring their own consumer drones to their vacation sites, hoping for extraordinary experiences of urban landscapes from the air (Uribe-Montesdeoca et al., 2021). The rise in the use of consumer drones at tourism destinations marks a substantial shift in the phenomenology of tourist places since such devices greatly enhance the visual sense of tourists through aerial gazing. Studying drone tourism in depth highlights the shifting leisure expectations among tourists and provides avenues for consumer-orientated destination planning. The aerial technology offers new visual perspectives on urban aerial space, requiring destination stakeholders to integrate these new representational techniques into their campaigns.

Drone photos and videos showcase unique perspectives on tourist attractions, which makes possible new forms of touristic gazing (Stone & Nyaupane, 2019). Despite the increase in drone tourism, the use of consumer drones is strictly regulated in many popular tourism destinations, including Lima, Mumbai, New York, Paris and Tokyo. Unmanned aerial vehicles, or drones, are flying objects which are controlled by remote pilots or software-enabled flight plans. The emerging technology was increasingly employed for commercial and humanitarian purposes in the late 2000s. Arguably, drone tourism constitutes a further arena for humanitarian drone usage as it enables tourists to participate in heritage documentation. The island city-state of Singapore is widely recognised as a hub for drone tourism since the local regulations are relatively liberal, and 65.5% of its population are in favour of drone photography and videography by public users (Tan et al. 2021, p. 8). Singapore's popularity as a tourism destination has increased steadily over the last two decades (e.g. Ritter, 2022b), with the number of international visitors rising from 6.9 million in 1999 to 19.1 million in 2019 (Yearbook of Tourism Statistics, 2022). The rapid growth of Singapore's economy in recent decades stimulated substantial investment in the architecture of local tourist areas, attracting visitors from around the world.

This article draws on a digital ethnography of drone tourism in Singapore's Marina Bay, examining the case of DroneTubers who constitute a subgroup of travel influencers circulating high-quality drone footage on the platform YouTube. Digital ethnography is an inductive-iterative research strategy involving multiple methods for exploring digital technologies within the context of everyday life. To gain a holistic

understanding of drone tourism in Singapore, this investigation is grounded in an ethnographic approach that combines in-depth interviews with participant observation in neighbourhoods and on digital platforms. Ethnographic accounts evolve through the dialectic relation between the self and the Other. To contextualise their research in their personal experiences of arrival and access, ethnographers weave a personal voice into their accounts.

Travel drones—consumer drones appropriated by tourists—alter how tourist places can be experienced and represented. The main phenomenon of this ethnographic study is the transformation of tourist encounters since the inception of travel drones in Singapore. Ethnographic research in urban areas provides exploratory insights into local drone practices at the nexus between the visitors and the visited communities. The main purpose of the investigation is to map tourist encounters facilitated by drone tourism. Although a multitude of tourist attractions has been portrayed in drone videos, solid in-depth investigations into drone tourism remain scarce. Very little empirical research has addressed the role of travel drones in urban tourism destinations. This study advances research on drone tourism by demonstrating how the use of travel drones entangles Singapore's urban landscapes in a platform ecology and shifts tourist encounters into a realm of datafied practices. Three key questions guide the case study of drone tourism in Singapore: How do the skilled practices of DroneTubers re-organise the techno-social production of the urban aerial space in Marina Bay? What kinds of gazing practices do travel drones facilitate? And, finally, in what ways do the videomaking practices of the researched travel influencers contribute to the diversification of tourist encounters?

Ongoing platformization processes dramatically changed tourist sites (Capineri & Romano, 2021). Such processes can be described as the penetration of economic, governmental and infrastructural extensions of digital platforms into the web and apps, affecting the production, distribution and circulation of cultural content (Nieborg & Poell, 2018, p. 4276). Tourist places that are highly popular with content creators are embedded in specific platform ecologies. In the context of this investigation, the term platform ecology refers to the manifold relationships between human actors, platform technologies and their local environments. Studying drone tourism through the lens of platformization illuminates the circulation of drone footage, circumventing a technology-centric assessment of drones. Evidence from the case of drone tourism in Singapore suggests that the videomaking practices of DroneTubers extended the scope of tourist encounters by establishing an everyday lived space where the allure of tourist attractions is negotiated through online co-presence. The first part of this article delineates the conceptual framework of the investigation, which is followed by a brief discussion of its methodological design. Finally, I analyse tourist encounters facilitated by drone tourism.

Reframing touristic gazing in urban aerial space

In the pre-Internet era, a defining aspect of touristic gazing was the pre-eminence of the visual sense in touristic experiences. Touristic gazing has many similarities with landscape aesthetics (Rink, 2017). Directed towards extraordinary scenes within a given landscape, the tourist gaze was initially framed by a hotel window, a car

windscreen, a bus window or a photo camera objective (Urry, 1990). The experience of visiting tourist sites was often shaped by expectations stimulated by promotional material, such as brochures and TV commercials. Digital platforms, however, facilitate forms of touristic gazing, which entail the stylised performance of a self-orientated visual culture and the othering of the visited people (Dinhopl & Gretzel, 2016a, p. 133). Photo sharing practices on Instagram epitomise how platforms provide affordances that allow tourists to perform gazing practices while popularising aesthetic aspects of a given tourist place (Oh, 2022, p. 4). Capturing slow sweeping imagery from a bird's-eye point of view, travel drones allow tourists to develop new relationships with tourist attractions.

While gazing is traditionally enacted in actual tourist places, drones possess the capability to generate platform content and to extend gazing practices beyond local sites. For this reason, drone practices are holistically studied within their platform ecology. Digital platforms can rapidly broaden gazing practices while inviting digital audiences to look at tourist attractions. The professionalization of content creation on YouTube and other platforms has significantly altered gazing practices. In contrast to the self-directed tourist gaze (Dinhopl & Gretzel, 2016b), the main motivation of DroneTubers is platform monetisation. Instead of portraying the mundane selves of their users, travel drones make possible cinematic views of tourist places. Drone tourism can thus be seen as a leisure practice of the post-selfie era (Mostafanezhad & Norum, 2018).

Drone users who upload captured drone footage on digital platforms engage in *participatory gazing*. This form of gazing can be seen as an extension of traditional touristic gazing since it involves perpetual audience participation which allows for a prolonged negotiation of meanings attributed to tourist attractions. Gazing practices facilitated by travel drones involve both the videographer who uploads the footage and their platform audiences. Furthermore, here the tourist gaze crosses into the participatory culture of YouTube. In the context of drone videography, YouTube facilitates a participatory culture that involves the sharing of skills through videos. A central feature of contemporary participatory culture is online mentorship, allowing experts to pass on their knowledge to novices (e.g. Burgess & Green, 2018; Jenkins et al., 2015). Drone tourism in Singapore is deeply intertwined with the participatory culture of YouTube since advertorials of drone models, how-to-do guides on travel drone videography, and edited drone footage on tourist attractions widely circulate on the platform.

The urban aerial space of Singapore is constantly produced and reproduced in everyday life by both people and technologies. Drones are a specific form of locative media, allowing for a dynamic visual exploration of space. They comprise a unique combination of visual and mobile affordances, providing distinct ways of relating to space (Hildebrand, 2021, p. 77). The DroneTubers under investigation experienced physical embeddedness in a local place and visual sensing through their devices' cameras. Materialising in situated contexts, travel drone practices can be illuminated through a threefold lens on the techno-social production of space (Chesher, 2012; Lefebvre, 1991). Stretching across local places and Internet technologies, the techno-social production of space is driven by the triad of spatial practices, representation of space, and representational space (Shinde, 2022, p. 5).

Reconfigurations of urban aerial space are anchored in an interplay between practice, thought and imagination. Firstly, situated drone practices are understood as spatial practices structuring the everyday lives of their users. By navigating their drones through the skies of Singapore, DroneTubers negotiate the socio-spatial relations with their urban environments. They are grounded in tourist places while viewing urban landscapes in real-time on a handheld monitor. In doing so, they become actors in the *lived* urban space. Secondly, drone cameras make possible a new representation of space. Travel drones gain agency in the production of urban space (Bauder, 2022, p. 3). Recording footage of urban aerial space, the researched drone users re-negotiate the socio-spatial relations with local stakeholders and reshape the *perceived* urban space. Thirdly, digital platforms empower additional spaces of representation. DroneTubers engage in a *conceived* space of Singapore on YouTube, where they and their audiences assign meanings to tourist attractions.

From touristic strolling to travel drones

Like many other Internet technologies, the origins of drones are rooted in military history (Gusterson, 2016). Currently, aerial photography drones, first-person-view drones, racing drones and toy drones are all considered small consumer drones. Numerous hobbyists appropriated the Internet of Things technology for civic purposes. Drones differ from other sensory devices, such as location trackers and smoke detectors, in that they entail a visual mode of sensing. Drone scholarship recently transitioned from its initial stage, in which the visual features of drones were primarily examined in military contexts, to a more comprehensive assessment of the broader sensory capacities of the devices (Agostinho et al., 2020, p. 251). Drones are increasingly seen as situated technologies that process multisensory information and recalibrate the experience of tourist places. Various forms of agency are attributed to drones. Fish and Richardson (2022) distinguish four types of drone power: biodiversity conservation, warfare, disaster response, (counter-)surveillance.

Technological advancements over the last decade have permitted the affordable manufacture of pilotless flight objects. For example, an increasing number of professional delivery firms make use of drones for the transportation of small items. Drone activists repurpose their devices for the documentation of environmental damage and counter-mapping (Fish, 2020, p. 250). Today, many Internet-connected tourists seek to make substantial embodied experiences of the places they have visited (Graburn, 2017, p. 91). Travel drones are largely made up of a foldable quadcopter, a camera mounted in a frame, and a remote control, but they are also coded objects, and their navigation and video production are facilitated by software. The popularity of consumer drones in tourist sites is closely reflected in the growth of drone-related content on digital platforms. While dedicated communities of practice evolved around the hashtag ‘traveldrone’ on Instagram, many popular YouTubers showcase their drone skills, review drone models, or give advice on airspace regulations.

Utilising travel drones enables users to perceive open-space tourist attractions from the air. By navigating the aerial device remotely, an operator can view a live feed from its camera on the display of the controller, record footage, and take photographs.

Countless technologies of space shape how meaning is ascribed to tourist encounters (Gibson, 2012, p. 58). The strolling of present-day tourists in unfamiliar territory is generally accompanied by various spatial technologies, including street signs, traffic lights, tourist offices and Global Positioning System (GPS) navigation apps. Operating in multidirectional spatialities, drones constitute a new aerospatial geography of tourism. The air is inhabited as a contested space of opportunities, dangers, and power relations (Klauser, 2022, p. 3). Although many consumer drones are designed to reach an altitude of up to 300 meters, aerial technologies are inherently moored to an infrastructure on the ground (Urry, 2003, p. 138). Data constantly circulate between drone devices and their grounded infrastructures.

The spatial phenomenon of drone tourism is examined here through a geographic lens to study the circulation of place images within arcs of communication (Adams, 2018, p. 592). This perspective brings to light the place processes inherent in drone videography. The everyday practices of DroneTubers are enacted between two vantage points of a techno-spatial trajectory, translating a media-in-place activity into a place-in-media activity (Adams, 2018). Tourist places and screens of digital devices are the two endpoints of the trajectory. Anchored in hyperlocal micro-geographies (Leszczynski, 2019, p. 209), consumer drones spatially centre users and their gazing practices in the physical vantage points of streets and neighbourhoods. The video-making practices of the researched drone users transform the local arrangement of gardens, streets and other tourist places of Singapore into place images that are brought into circulation by digital platforms such as YouTube. Experiences of tourist places are increasingly enveloped in platform ecologies. Screens of digital devices become digital vantage points for mediated experiences of tourist places.

The emergence of drone tourism

Following the increased intertwining of digital platforms and everyday routines in the latter half of the 2010s (Nieborg & Poell, 2018), the global expansion of big platform corporations also reshaped local practices across a multitude of tourist sites. Technologies employed in videography are increasingly designed for the rapid production of ephemeral content. Arguably, it is now common for contemporary tourists to bring video equipment with them on their travels, such as digital camcorders and GoPro action cameras, but many also experiment using drones to make spectacular videos. As drone footage of tourist attractions increasingly surfaces on the Internet (e.g. Stankov & Vujičić, 2022), drone videography has been described as a central emerging visual practice in tourist contexts (Vujičić et al., 2022). Scholarship on both the benefits and risks of drone tourism has diversified in recent years, including the pioneering work by Hay (2016) which explored how industry managers and student tourists made sense of drone technologies.

Much of the existing research into the use of drones in tourism destinations assessed the audiovisual portrayals of tourist attractions by destination marketers (e.g. Stankov et al., 2019). Drones can also enable forms of virtual tourism which negate the need for individuals to physically travel to the tourist sites (Mirk & Hlavacs, 2015), indeed virtual drone tourism was commended for its sustainable utility (King, 2014).

A further strand of research focused on the varying perceptions of, and reactions to, drones in tourism destinations. While Choe et al. (2021) assessed the perceived risks associated with flying drones before and after the global pandemic, a comprehensive survey study examined how tourists experience the presence of drones in tourism destinations (Jiang & Lyu, 2022). Customer engagement strategies for drone tourism were assessed in the context of Rome (Ilkhanizadeh et al., 2020). Another contribution to the nascent research area examined how tourism organisations deployed drones as a research tool for exploring visitor behaviour at heritage sites in Northeastern Spain (Donaire et al., 2020).

With the exception of a few investigations (e.g. Chen et al., 2020; Zuev & Bratchford, 2020), research into drone usage among tourists lacks theoretical depth and a solid understanding of how the emerging technology transforms the techno-social production of urban aerial space. Although the role of drones was thoroughly researched among Native American Sioux activists (Tuck, 2018) and journalists (Brüggemann et al., 2022), social scientists have not paid adequate attention to the platform ecology in which the production and circulation of drone footage are embedded. An ecological approach to drone tourism enables ethnographers to trace the situated practices of tourists in local contexts and on digital platforms, making transparent the complex entanglements of their lifeworlds and techno-spatial infrastructures. Rather than primarily foregrounding the widely overhyped technological features of drones, holistic research follows drone tourists to local places and on digital platforms.

This investigation explores travel drones as an emerging, and indeed captivating technology in contemporary tourism. The term emerging technology relates to a set of material things that come into being or are imagined to be developed in a future world (Lanzeni & Pink, 2021, p. 767). The implementation of emerging technologies is regularly surrounded by imaginations, visions, expectations, dystopian or utopian stories, moral concerns and narratives of societal change (Pink et al., 2022). Although such tendencies are imagined and projected to a possible future, they can have real consequences for companies, markets and governance. One imaginary depicts travel drones as a technology that replaces physical human travel. Before discussing a specific case of drone tourism in Singapore's Marina Bay, I will present the rationale behind the methodological choices in which the investigation is grounded.

Methodology

The investigation into drone tourism in Singapore is based on an ethnographic approach to emerging technologies. Digital ethnography is an established interpretive methodology for studying mobile media, such as GPS navigation apps, drones, or wearables. Contemporary ethnography predominately involves participant observation and qualitative interviews for exploring hybrid spaces where the digital and the physical merge. Ethnographers aim to collaborate with the researched communities while reflecting on their own role in the research process. This methodology enables researchers to elicit emic perspectives on local drone practices and to experience drone tourism first-hand. Furthermore, a non-media-centric approach is well suited for research questions about tourist encounters since such practices are negotiated

in situated contexts. To position myself in the ethnographic research process, I describe the personal circumstances that made the research project possible. The following self-referential passages describe my pathways to Singapore and my encounters with drone users. I also reflect on my identity during fieldwork to increase the comparability of the ethnographic account.

I began the ethnographic fieldwork among travel influencers in Estonia in the summer holiday season of 2018. Since many of the travel influencers who participated in the research identified as 'digital nomads', I followed this mobile community of practice to other tourist destinations, some much further afield. Tourism is, by definition, rooted in mobility, and travel influencers are constantly moving between tourism destinations. Consequently, tourism researchers are often required to carry out their fieldwork in short spells during high seasons (Graburn, 2002, p. 20). Between summer 2018 and spring 2020, I studied the skilled practices of several travel influencers, shadowing them to various tourism destinations, including Angkor Wat, Bangkok, Berlin, Chiang Mai, Chiang Rai, Hanoi, Helsinki, Kyiv, Kuala Lumpur, Riga, Singapore, Sofia, Stockholm, Tallinn and Vilnius. Utilising the ethnographic research tool travel-along (Howard, 2017), I could actively explore the travel influencers' streams of experience, their mobile practices, and the localised meaning-making within their travel destinations. Participant observation was also conducted in numerous physical settings, and I followed the profiles of travel influencers on digital platforms. My impressions of field sites were documented in fieldnotes on my laptop and in notebooks.

During the course of the mobile fieldwork, I travelled twice to Singapore. The on-site ethnography took place in January 2019 and January 2020. To gain access to relevant data, I immersed myself in the local scene of drone enthusiasts and visited numerous places popular with drone tourists in Singapore. I took on various observational roles, which included attending meetings of the Singapore Drone Association and accompanying travel influencers during their drone sessions. My immersion in urban neighbourhoods allowed me to approach key informants who shaped my understanding of local drone practices. In addition to my physical presence at tourist sites, the study of drone tourism in Singapore required participant observation on digital platforms (Pink et al., 2018). For instance, I participated in conversations on Facebook fan pages and followed the Twitter hashtag 'aerialvideography' and the Instagram hashtag 'dronevideo'.

While participating in local events in Singapore, I was mainly perceived as an English-speaking, Caucasian European tourist. Although my navigational skills were rather basic, they opened the way to engage in conversations with other drone users. To mitigate gender, racial and ethnic biases, I attended various types of events and included numerous voices from different backgrounds in the ethnographic account. In addition, I sought to minimise my interviewer bias and used a loosely structured interview guide,[1] allowing interlocutors to raise their own topics. The ethnographic immersion in tourist sites was enhanced by 15 in-depth interviews with travel influencers and tourism professionals whom I encountered during the mobile fieldwork. Data sources of the investigation included handwritten and digital fieldnotes, interview transcripts, photographs, and materials from Instagram and YouTube, such as screengrabs and archived videos. I analysed the ethnographic data in accordance with the

procedures of the grounded theory (Jinghong et al., 2019), relying on sensitising concepts as starting points for the coding process (Bowen, 2006, p. 14). The individual stories of a DroneTuber presented in the following sections illustrate categories that frequently occurred in the ethnographic data (Figure 1).

Singapore by drone

To assess the reconfiguration of urban aerial space in tourist sites, I draw on the case study of Marina Bay. Located in downtown Singapore, the urban area is a highly popular tourism destination. It hosts numerous iconic tourist attractions, including Gardens by the Bay, the luxury hotel complex Marina Bay Sands, the Fullerton Hotel, the Sands SkyPark, the Supertree Grove, and a waterfront promenade. Marina Bay is glamorously depicted in numerous travel magazines, TV series, and movies. In addition, a unique digital culture comprising travel blogs, photographs and video clips has taken inspiration from the tourist site. Drone footage of Marina Bay became one of the latest facets of this digital culture. The 29-year-old, Canadian DroneTuber Marc vividly remembers his first drone registration in Singapore:

> The first requirement to fly a drone in Singapore is the registration. If you come from overseas, and you want to fly your drone, you have to buy a sticker and register it with the Civil Aviation Authorities. The no-fly zones can be seen on the official drone map, which can be found on many websites. Most importantly, not within a 5-kilometer radius of the airport. If you don't comply with the rules, you will get a high fine. 10,000 dollars. Singapore is a fine city.

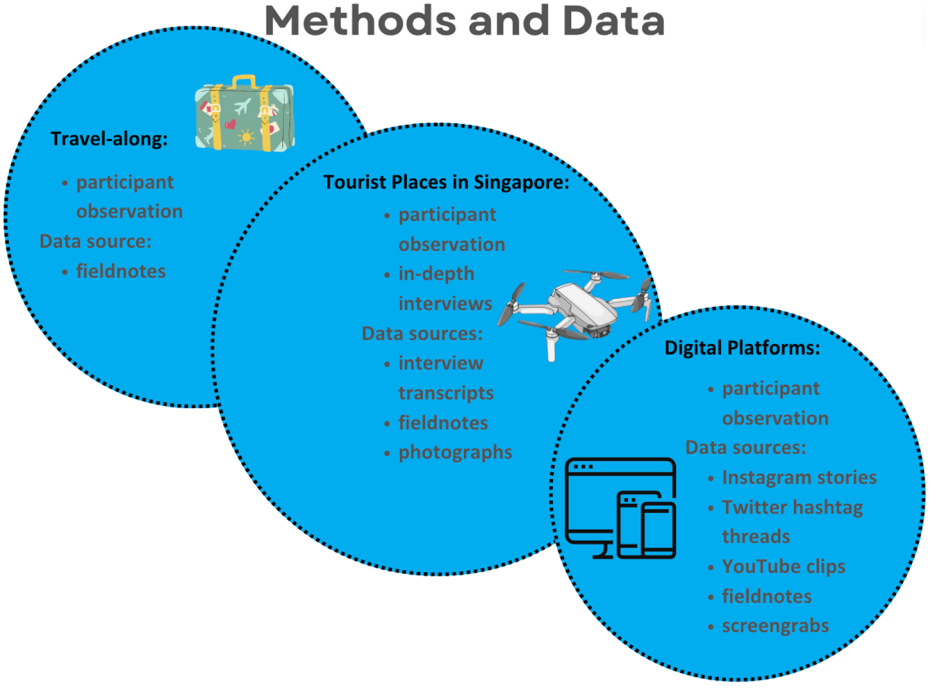

Figure 1. Data collection strategy.

The local aviation authorities developed detailed guidelines which delimit the legal usage of drones in Singapore. The relatively liberal regulations governing the aerial use of the devices made the island city-state a hub for drone tourism. At the time of the investigation, users were required to register their drones if they weighed more than 250 g (Markert, 2020), and severe penalties were introduced for flying unregistered drones. In addition, recreational pilots whose drones weighed between 1.5 and 7 kg were required to attend basic training sessions. Users had to be at least 16 years old to register their drones.

The genre of drone videography enables DroneTubers to interpret and portray urban landscapes. Alisha, who is from the Philippines, used her consumer drone during a 'creator festival' in Singapore. The 25-year-old drone enthusiast describes her drone videography style in the following interview passage:

> This was part of one of our tours [during the creator festival, author]. We were like: Can we start it on the hotel roof and fly our drones? In this area, there were seemingly no restrictions for our drones… Most of my style originated when I was producing videos and I wanted… I don't per se like to speak on camera. I don't really like having my face on camera… If you watch the video that I produced in Singapore… It originated from a desire to express myself without having to speak. And this is somehow filtered into how I edit my videos. And then, most recently, I incorporated some text in videos and it seems to resonate with people.

Aerial urban space unfolds as a complex conduit through which people participate in processes of world-making (Crouch, 2006, p. 45). DroneTubers partake in making sense of the world while circulating meanings attributed to areas. Drone videography styles shape how audiences on platforms such as YouTube interpret the displayed urban scenery.

Participatory gazing and tourist places

The skilled drone practices of the researched DroneTubers were ultimately geared towards the dissemination of their material on digital platforms. As drones are objects around which cultural activity occurs (Fish, 2020, p. 254), video sharing practices are equally important for understanding the socio-spatial dynamics of drone tourism. Escaping the 'cubicle farm' of computer-centred office spaces, many aspiring travel influencers are attracted by the promises of self-organised digital labour. Drone footage is therefore considered to be a substantial asset, which can be monetised as content on YouTube or similar video sharing platforms. Content creation is a livelihood strategy for many travel vloggers around the world (Ritter, 2022a, p. 447), and their prime objective of platform monetisation has repercussions for their choices of tourist sites and their touristic gazing practices. The YouTube partnership program is open to YouTubers who attain 500 subscribers and three valid public uploads within the previous 90 days, and achieve either 3,000 valid public watch hours on long form videos in the past year or 3 million valid public short views in the last 90 days (YouTube Creators, 2023). The program entangles content creators in a world of metric systems and constant evaluation. As the following transcription from a video extract shows, the YouTuber *Travel Intern* advises platform audiences on locations for legal drone usage in Singapore:

> Like you, we thought that Singapore is a gigantic no-fly zone… In this video, we are going to show you where we think are the five best places to fly your drone in Singapore. And we are also using the brand new Air 2S, sent to us by our friends at DJI. It's gonna be an epic one. So, let's go… last but definitely not least, our fifth location is none other than Marina Bay. This is another great place to fly the drone, as you not only get iconic Singapore landmarks like Marina Bay Sands and the Singapore Flyer in the background, but on top of that, you also get an unobstructed space to try out some creative shots and movements (Travel Intern, 2021).

The vlog recommends a series of places where legal drone practices can produce exceptional footage. In addition, product placement is woven into the narrative of the video and viewers can find a link to the Air 2S drone in the description section. Drones enable new ways of seeing. An established genre of drone videography is the cinematic rising shot. This recording technique can begin with a closeup of a lane or building and, subsequently, the drone rises into the sky gradually revealing the surroundings. The video sharing practices of DroneTubers extend the tourist gazing into the dynamics of audience engagement. The performance of participatory gazing shifts the focus from the self-centred tourist displayed in front of a tourist attraction to audience engagement during post-video discussions. In the Singaporean context, the act of gazing is detached from the local tourist site. The touristic gazing that drones enable is not a local practice in a specific tourist site, rather it comes to life as a set of platform practices among DroneTubers and their audiences.

Tourist encounters in the age of travel drones

Tourism is an embodied leisure activity that frequently involves encounters with the Other. Tourist encounters can be geographically analysed in terms of material space, surveillance, and governance (Paterson, 2009). Contemporary travel involves multiple forms of encounter as tourists constantly come across other places, landscapes, weather, people, representations of places, technologies and sights (e.g. Gibson, 2012, p. 55). The case study of drone tourism in Singapore shows that digital media technologies complicate tourist encounters, restructuring the relationships between guests and hosts. Visited communities and visitors negotiate back and front zones of encounters. The DroneTubers under investigation make encounters online and offline. The boundaries between physical tourist sites and places on digital platforms are constantly blurred in the experiences of drone tourists as they learn about drone practices from YouTube videos, fly drones in physical spaces, and share their own footage on digital platforms. YouTube clips and comments establish an asynchronous co-presence which can be accompanied by synchronous co-presence through livestreaming sessions on the platform. Contemporary tourists constantly oscillate between online/offline co-present spaces within their everyday lives (Hjorth & Pink, 2014, p. 44).

Drone tourists who visit Singapore undergo various encounters with local infrastructures, technologies, drone experts and local drone enthusiasts. Flying a drone is an embedded bodily practice anchoring a person in the material space of a tourism destination. Travel drone practices include the embodiment of regulatory guidelines, the navigation of a flying object, the haptic exploration of urban aerial space, and

the production of aerial footage. In Singapore, the encounter between local drone enthusiasts and drone tourists occurs in various local places. Such local front zones of encounter include drone shops, drone training facilities and local post offices where labels for registered drones can be purchased. For example, drone equipment can be acquired at Dà-Jiāng Innovations stores. Furthermore, the Multirotor Association of Singapore regularly organises drone races, which are often attended by tourists and locals alike. Front zones of tourist encounter have also evolved on the Internet. Post-video discussions serve as places of encounter on YouTube, and many users share their memories from past journeys to the city-state. TripAdvisor forums are other digital places of encounter where users can communicate on drone laws in Singapore.

Local drone hobbyists and drone tourists can meet at different online and offline places. The increasing popularity of drones among tourists and the uncertainties associated with local drone laws in many tourism destinations prompted the formation of a global public sphere in which touristic drone uses are debated. Many drone tourists share their drone photography and videography to entertain audiences on digital platforms. Drone tourism has indeed blossomed on the fertile ground of this participatory online culture. In the 20th century, the lived space of cities was mainly populated by inhabitants who engaged in spatial practices and meaning-making in physical settings. However, recent research into the role of locative media in the production of space indicates that the digital worlds of satellite navigation devices and computer games are also imbued with lived space (Chesher, 2012, p. 317). In the case of drone tourism in Singapore, the platform ecology of the tourist attractions in Marina Bay entails two forms of lived space. On the one hand, the physical surroundings of Marina Bay are experienced as lived space during the recording of drone footage, while on the other, digital platforms such as YouTube provide lived spaces where meanings are assigned to tourist attractions through online co-presence.

As drone footage frequently displays urban landscapes, drone videography involves techniques of landscape representation. The arrangement of matter in Singaporean neighbourhoods is represented in drone videos, making possible new ways of seeing urban space (Adams, 2018, p. 592). The frequent use of travel drones in Marina Bay re-organised the techno-social production of urban aerial space as drone practices gave rise to an additional space of representation for tourist places. Drone footage represents the urban neighbourhoods from new aerial angles, complementing the static representation of urban space in satellite imagery used for GPS navigation apps, such as Baidu Maps and Google Maps.

By tracing the formation of digital tourism geographies, the Singaporean case of drone tourism bears relevance far beyond the frontiers of the island city-state. Drone practices are embedded in the triadic interrelations between technology, humans and places. Drone tourism transforms these interrelations by enabling touristic flows of place images between physical vantage points in tourism destinations and the digital devices of future visitors. Digital tourism geographies are not only formed by the movement of bodies, services and goods, but increasingly by the circulation of place images through the often-obscured techno-spatial infrastructures of digital platforms, including headquarter buildings, intermediaries, antennas, undersea cables, and data centres. As the topography of tourism destinations is progressively recorded by consumer drones, flows of place images expand the ways in which tourist places can be

experienced. The platformization of tourism intrinsically connects destinations to lived spaces where spectators assign meanings to tourist places.

Conclusion: towards a platform ecology of drone tourism

The case of drone tourism in Singapore's Marina Bay brought to light that the DroneTubers under investigation performed participatory gazing with their platform audiences. Extending traditional forms of tourist gazing, participatory gazing is based on recurring audience participation and allows for a re-negotiation of meanings attached to tourist attractions. The investigation also revealed that Singapore's local authorities actively inform incoming drone tourists about aerial regulations to encourage appropriate conduct. Travel drones are embedded in a wider platform ecology, connecting the lifeworlds of local tourism employees with the professional lives of full-time content creators. The case of drone tourism in Singapore suggests that the videomaking practices of DroneTubers extended the scope of tourist encounters by establishing an everyday lived space where the allure of tourist attractions is negotiated through online co-presence. Tourists interested in Singapore can meet local drone enthusiasts in online front zones of encounter, such as YouTube comment sections and TripAdvisor forums. The outcomes of the ethnographic investigation indicate that destination planners should establish local regulations for aerial safety and launch promotional campaigns at platform locations where drone users congregate.

The findings of this study are limited by the choice of field sites. Drone tourism carries great potential to ease local traffic in sought-after destinations and to include people with disabilities in the meaning-making surrounding tourist attractions, which can be addressed in future research. This investigation implies that tourists' understandings of the world are to a large extent constituted by everyday lived spaces evolving on digital platforms. Flows of place images shape ways of seeing among tourists prior to their arrival in tourism destinations. Tourists experience place images of a given tourism destination online, guiding their navigation through, and interpretations of, the destination during their actual travels. Digital tourism geographies span over physical sites, such as streets and neighbourhoods, and lived spaces on platforms. To map the political economy of digital tourism geographies, researchers should bridge insights into the needs of visited communities with theories of the techno-spatial infrastructures of platforms. Research into digital tourism geographies can be enhanced by mixed-method designs integrating ethnographic assessments of physical locations with computational methods.

Two features set drones apart from other emerging media technologies. On the one hand, travel drones enable tourists to make out-of-body experiences and engage in new forms of world-sensing through a display on a remote control. However, on the other hand, travel drones are mobile recording devices destined for the rapid production of monetisable footage. The future of drone technologies is widely imagined between fears over dystopian weaponry and praise for civic empowerment. The case of drone tourism in Singapore demonstrates the innovative strength of the emerging technology, underscoring its ability to collect cinematic footage of tourist sites for aesthetic serenity. Aerial representations of Singapore's urban scenery often evoke a sense of stillness.

Note

1. The interview guide contained the following questions and topics:

1. Can you tell me a story about something that you experienced in the last two weeks at work or in your neighbourhood?

Drones

2. How come you fly drones in Singapore?
3. How would you describe your drone? Which type of drone do you use?
4. When did you start with this hobby?
5. Where do you fly drones in Singapore?
6. How do you use drones when you travel?
7. How do you record and cut your drone footage?

YouTube

8. I saw that you post drone videos on YouTube and other platforms. Could you tell me more about these online activities?
9. How do you keep your audiences happy?
10. What do you make of the monetisation of YouTube channels?
11. Which drone video is your best?
12. Which genres of drone videos do you produce?
13. Are there any other drone videos you would like to talk about?
14. What do you think of YouTube's recommendation algorithm?

Navigation

15. How difficult was it for you to learn flying a drone?
16. Which equipment do you use to navigate your drones?
17. What would you recommend to a beginner who intends to fly a drone?
18. What kind of drone training did you attend?
19. Did you experience any accidents while flying a drone?
20. Do you use autonomous flying software for your drone?

Data

21. Many small drones are able to collect quite a bit of data. For example, geolocational data, imagery, etc. How do you feel about that?
22. How do you use your drone data?
23. What do you make of drone companies that store all the drone data of their customers?

Ethics

24. In many countries, local populations are highly critical of drones in urban areas. What do think of such resistance?
25. How do you approach drone critics?
26. Do you think that drone usage should be more restricted in urban areas?
27. What do you make of the drone regulations in Singapore?
28. How important is the safety of humans and animals for you in the context of drone tourism?
29. In which areas should the flying of drones be allowed in cities?
30. Is there anything else you would like to tell me?

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