Convergent Digitality for Design Action in Obstructed Landscapes

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Abstract: Processing centers for refugees present a range of challenging design problems – they are regarded as temporary and disposable, they occupy otherwise undesirable locations in the landscape, occupants are socially distinct from their host, and they may embody unpleasant political messaging. Thoughtful spatial design is rarely employed – but could be. Design exercises based on such settings present a chance for students to face and address the challenging social and environmental issues of the future. Because the relevant locations can be hidden, and access to them may be limited or denied, we work on the development of convergent digital workflows that allow a systematic and holistic analysis of the sites and their conditions. Aim of these efforts is the attainment of lifelike and pragmatic design outcomes in the context of contested landscapes.

Keywords: Contested landscapes, refugee camps, remote sensing, fieldwork, landscape design

1 Topic, Terminology, and Case

The topical framework of our master's program in landscape architecture calls for the study of contested landscapes and territories. Things that are contested are made the object of contention or competition, matters that humans fight for, and that they strive to win or hold. The Latin verb *contestari* means *to call to witness* respectively *bring action* (MERRIAM-WEBSTER 2019). Obstruction implies blocking or closing up something by an obstacle, hindering someone from passage, action, or operation, as well as cutting things off from sight (ibid.). Convergent, an adjective tracing back to the Latin verb *convergere*, means *tending to meet or actually meeting in a point* (HARPER 2020). Accurate semantics are fundamental for our intellectual positioning, as well as for future dissemination of our research and design outcomes.

For the coming semesters, we chose migration as a guiding subject, the Greek island of Lesvos as the first location for analytical fieldwork, and a processing center for asylum seekers and other migrants in Moria as a first study and design case. The Moria camp, constituted by disused military barracks transformed into one of the variously-named reception and identification centers in Southern Europe, made the headlines, because for years yet it is hopelessly overcrowded, and its Greek governor, Yiannis Balbakakis, resigned in 2019 – self-confessed tired, and despaired (KATHIMERINI 2019). In the same year, a fatal fire broke out in the camp, followed by riots and tear-gassing (SMITH 2019). In our professional role as spatial designers and landscape architects, on no account coming as aid workers, we approach the intricate situation in Moria by bringing the raw figures to our mind. In January 2020, an estimated 19,000 people were insufficiently sheltered by shipping containers, tents, and makeshift structures, while the existent facilities had been laid out for 3,000 people only. The amply documented squalid living conditions in the camp, repeatedly criticized by humanitarian organizations, don't come as a surprise. Thousands of people live in makeshift tents of plastic sheeting in an olive grove dubbed 'the jungle', beyond the official camp area. "There's no security; police officers don't come near; and there are fewer services like electricity or

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sanitation" (MASTRANDREA 2019). Our core assignment is elementary but complex meddling with the collective design of an adequate reception and identification center structure, inclusive effectual facilities for everyone in the center (camp), to make humane living conditions possible. We conceive of the need for a series of local design assignments touching a global issue of growing political, social, and economic implications. The so-called European refugee crisis will not be solved shortly, on the contrary, it most probably will tighten. We are interested in the development of spatial solutions for people in trouble. For this purpose we work in an investigative mode, understanding ourselves as action researchers, and we are aware of not necessarily having been summoned to do what we do. These are the factors that form the foil of the research approach specified in the paper at hand.

2 Considerations and Constraints

We are on our way to touch upon some rather sensitive spatial, political, social, and ethical issues. We try to render ourselves able to go with our students into contexts that may be ambiguous. We intend to conduct design-oriented fieldwork in places that are the object of contention, dispute, or competition. We compass the application of digital tools and systems for hidden or inaccessible spaces and cases that not unconditionally allow for their straight use. Therefore the nature of our proceeding has to be distinguished from a forthright approach and operated in an auxiliary mode. To conduct academically sound work on obstructed landscapes and territories, we obviate any form of confrontation, violation, or trespassing. Instead of that, we form up to develop methods of circumnavigation and diversion, without abstaining from our particular aspirational target. Obstructed environments, often hold problems that landscape designers should be interested in. Investigating and making these problems visible, creating awareness, developing related design proposals, and initiating preferable change, forms the core of our design efforts. A seemingly growing common perception that today's world would become smaller, and that one could reach any part of the globe in the blink of an eye, may not hide the fact that such assumed freedom, mobility, and accessibility does merely apply to a fraction of global geography and its population. The broadening of digital interconnectedness did not contribute to an expected invalidation of space and time. We distinguished this sober actuality not only when we began to plan for the implementation of our own university's special mission (NMBU – Norwegian University of Life Sciences), which targets radical global challenges like climate change, environmental pollution, population growth, migration, poverty, and others. The following institutional avowal is fundamental for the direction of our master's program in Landscape Architecture for Global Sustainability: "Our students will be encouraged to adopt a mindset in support of sustainability. They will have the knowledge, competencies, and skills required to meet major global societal challenges" (ibid.). At the same time, academic maneuverability increasingly becomes affected by wilfully reduced mobility. Reasons for this can be ecological necessities, political realities, as well as societal or ethical tendencies. Carbon dioxide emission has to be reduced. Global flight shame will presumably have serious impacts on the travel policies of universities, and the growing consideration of research ethics will change current research practices. Ongoing or imminent conflicts and territorial contention will make traveling and movement for fieldwork purposes not easier. We are obliged to take the progressing consideration of research ethics seriously. Operating in spatial design, a discipline that didn't pay all too much attention to ethical considerations before, we try to make progress in that direction. Research ethics (SJOBERG 1967) regard the "[…] application of moral rules and professional codes of conduct

to the collection, analysis, reporting, and publication of information about research subjects, in particular, active acceptance of subjects′ right to privacy, confidentiality, and informed consent" (ENCYCLOPEDIA.COM 2019). The three key issues in research ethics are the research subjects' right to refuse to co-operate, the right for information supplied to researchers to remain anonymous and confidential, and the right to give or withhold informed consent. Informed consent ensures that research results are not made public without the subjects' knowing agreement (ibid.). In the course of our fieldwork approach, we categorically avoid touching or including information that could be classified as personal, intimate, or confidential. We conduct research and design for people, but in the frame of our institutional work, we are not aiming at information from or services for individuals, nor are we instrumentalizing or intellectually exploiting their cases or fates. Altogether, we intend to unconditionally observe the medical profession's ethical ground rule, reading 'do no harm'. A rule that has meanwhile been applied to the wide field of digitality as such. Since 2018, Harvard University and the Massachusetts Institute of Technology are jointly offering a course on the ethics and regulation of artificial intelligence. At the University of Texas at Austin students are taught ethical foundations of computer science. At Stanford University, a computer science ethics course is offered (SINGER 2018).

In the course of the convergent digitality approach, we make use of potent technology, that, on one hand, allows us a conflict-free bypassing of local constraints and the avoidance of invasion of personal privacy. On the other hand, it potentially permits us to see more from a remote perspective than from nearby (in situ), due to the military provenance of the applied high technology. Such technology is no longer pilot-controlled or person-operated – and therefore kind of inculpable. Technology becomes increasingly independent and freelancing, comprising toddler's toys, milking robots, self-driving cars, espionage equipment, just as autonomous weapons.

3 Mighty Global Digital Systems

Almost all digital tools and systems we use for our range of work – from local, small-size landscape architecture, down to large-size geodesign with global ambitions – are of military or intelligence provenance or cognition. We regard the proper addressing of the semi- or non-civilian descent of powerful digital globes like Google Earth, mainstream positioning systems like GPS, purchasable tools like camera and survey drones and others, as an important prerequisite for the ethical and civilian use of these systems, devices, and machines. We also should flag up, that, at bottom, we and our colleagues worldwide, use these systems for more or less similar purposes they had been invented for – information mining, analysis, and preparedness for decision making. However, we employ different terminology, and, of course, pursue different goals than soldiers or spies would do. What civilian designers and scientists carefully call remote sensing, originates from long-range reconnaissance of the military. What we call on-site analysis or fieldwork, is not entirely dissimilar to recce and intelligence. When landscape architects openly fly camera drones in order to gain photos and footage, something also common for many tourists, we intrude into public and private space in a quite similar way as a stealth flying eye would do, in a covert operation. Then almost any of our digital cameras feature zooming ratios and image resolutions beyond intelligence-grade.

Sitting and turning the digital globe of Google Earth, conveniently relates us to any geographical position in the world, but simultaneously ties us inadvertently to declassified data of the American Central Intelligence Agency, the "[…] nation's premier agency for providing global intelligence in the ever-changing political, social, economic, technological and military landscapes" (CIA on LinkedIn 2019). In 2003, a San Francisco company called Keyhole Incorporated, having its roots in video game technology, created a program that stitched satellite images and aerial photographs into seamless 3D computer models of the Earth (LEVINE 2018). "It was a groundbreaking product that allowed anyone with an internet connection to virtually fly over anywhere in the world" (ibid.). The CIA invested into Keyhole, in partnership with the National Geospatial-Intelligence Agency (NGA), a combat support agency under the United States Department of Defense and a member of the United States Intelligence Community (WIKIPEDIA 2019). In 2004, Google bought the Keyhole company and transformed its software into Google Earth. The continuously growing, civilian-military digital globe 'Google Earth' wouldn't have been rendered possible without a much earlier invention – originally motivated straight militarily – the Global Positioning System (GPS). Launched in the United States in 1973, opened for civilian use in the 1980s, and fully operational since 1995, it meanwhile comprises 32 satellites. The system provides geolocation and time information to all GPS receivers on or near the Earth (Fig. 1), provided that they exhibit an unobstructed line of sight to four or more GPS satellites (WIKIPEDIA 2019).

In our workflow, we make use of almost all the above mentioned technological systems, because they effortlessly transcend geographical constraints, global frontiers, local fences, and even topical taboos. Global visibility and conspicuity play a role in our work on refugee settlements. Making existent shortcomings visible may mark the start for positive change. In a matter of seconds, Google Maps measures the walking distance between the Moria camp, with about 20,0000 people constituting the second biggest *city* of Lesvos island, and the next reasonably priced supermarket – a German Lidl branch. The bidirectional distance is about ten kilometers, taking a minimum of two hours on foot. The inadequacy of the camp's location and infrastructural configuration couldn't be demonstrated more clearly. Many of the migrants live in the Moria camp for several years yet.

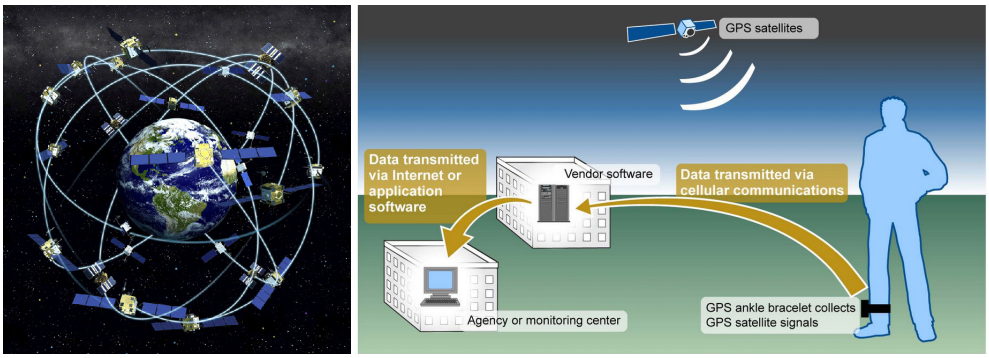

Fig. 1: Global Positioning System (GPS) – worldwide coverage and individual registration. Left: GPS satellites constellation (NOAA 2008). Right: GPS-Based Offender Tracking System (U.S. GOVERNMENT ACCOUNTABILITY OFFICE 2015) (Graphics: Wikimedia Commons, 2019).

4 Digital Ambitions and Local Limitations

At our school, we have a large spectrum of prevalent digital mobile and stationary tools at our disposal, including drone technology, mobile Virtual Reality (VR) devices, and a VR-laboratory on campus. At NMBU, VR-technology since long has been applied for work on contested landscapes, by Ramzi Hassan and Karsten Jørgensen (JØRGENSEN & HASSAN 2014, HASSAN & JØRGENSEN 2018). Their work aims at the digital documentation and preservation of heritage sites and historically important landscapes in Palestine, as well as on efforts for introducing a related digital library based on VR technology. Like that they help to *immortalize* increasingly dissolving and widely inaccessible cultural and archaeological heritage of historic grandeur, situated on contested territory (HASSAN & JØRGENSEN 2018). The work instrumentalizes affordable technologies inclusive free tools such as mobile-based VR technology, Augmented Reality, panoramic spherical photogrammetry, 360-degree video capture, spatial databases, Geographic Information Systems (GIS), 3D modeling, 3D mapping, Google street view, and Google maps (ibid.). The work in Palestine wouldn't be possible without well-established personal relationships with local academic institutions and governmental bodies, essential networking, and door opening by supporting peers and friends – a meshwork of contacts established over a long time.

Within the scope of the upcoming NMBU master's program in Landscape Architecture for Global Sustainability, aiming at contested and potentially hidden or inaccessible landscapes and territory, we locate ourselves in a different initial situation. We are not disengaged from the rather short cycle of two academic years as well as the steady loop of incoming and graduating students. What is more, we want to enable ourselves to take on emerging topics and conduct related fieldwork without long lead time. The Moria camp, laid out for 3,000, and occupied by 19,000, constitutes a plausible example of exigency, from our point of view. Determined to conduct on-site fieldwork on this partially obstructed place, we decided to switch from a straight front door approach to a predominantly tangential, considerate, spatial approximation and presence. In preparatory discussions, local academic partners from the University of the Aegean, Lesvos University Unit Mytilini, indicated that it would be easier to capture the reality that the refugees struggle with, from outside the camp than in the camp itself. A circumstance that we were able to attest to during fieldwork. The camp had been visited by too many sensation-seeking journalists with camera teams (e. g. MCELVANEY & AL JAZEERA 2018), which did not result in favorable tidings. Due to the negative press, the central, formal part of the migrant facility is meanwhile inaccessible. The peripheral, informal part of the camp which extends to the surrounding olive grove, 'the jungle', can be accessed at one's own peril. We did not experience any negative incidents while doing so. An unimpeded application of prevalent, mobile, digital devices like cameras, scanners, measuring instruments, drones (UAVs) and others, is not possible. Nevertheless, we were able to gain representative samples and a realistic overview of the situation. Back in the studio, we aligned our selective on-site impressions, documented by individual drawings, photos, videos, and sound recordings, with the geographical-spatial context, provided by Google Earth, Google Maps, and paper maps we received from the University of the Aegean. The systematic oscillating between the camp vicinity and the city of Mytilini constituted an insightful method

of analytical fieldwork on Lesvos. It also enabled us to formulate a clear-sighted design project with two essential deliverables. Besides the elaboration of an actionable proposal for an enlarged reception and identification center structure (camp structure) inclusive adequate facilities for 20,000 to 30,000 people, we are on our way to design an exemplary city of refuge, for the same number of people. In the field, we realized, that the very first key point, mentioned on page one of the UNHCR Emergency Handbook, section 'Site planning for camps' – reading "Consider alternatives to camps whenever possible" (UNHCR 2019) – makes absolute sense.

5 Convergent Digitality Framework

Our fieldwork and studio framework consists of the following considerations and components. Contested landscapes are full of resistance to their disclosure, nevertheless, we intend to enable ourselves, to conduct educational, research and design-oriented work in exactly those contexts – on a sustained basis. The unconditional relevance of research ethics motivates our institutional and individual circumspection:

1) We aim at the compensatory application of digital tools, systems, and facilities for joint design research action in the field (fieldwork) and on-campus (studio work) – applied to cases and situations globally that typically don't allow for unhindered access, physical presence, as well as the unimpeded application of prevalent, mobile, digital devices like cameras, scanners, measuring instruments, drones (UAVs) and others.

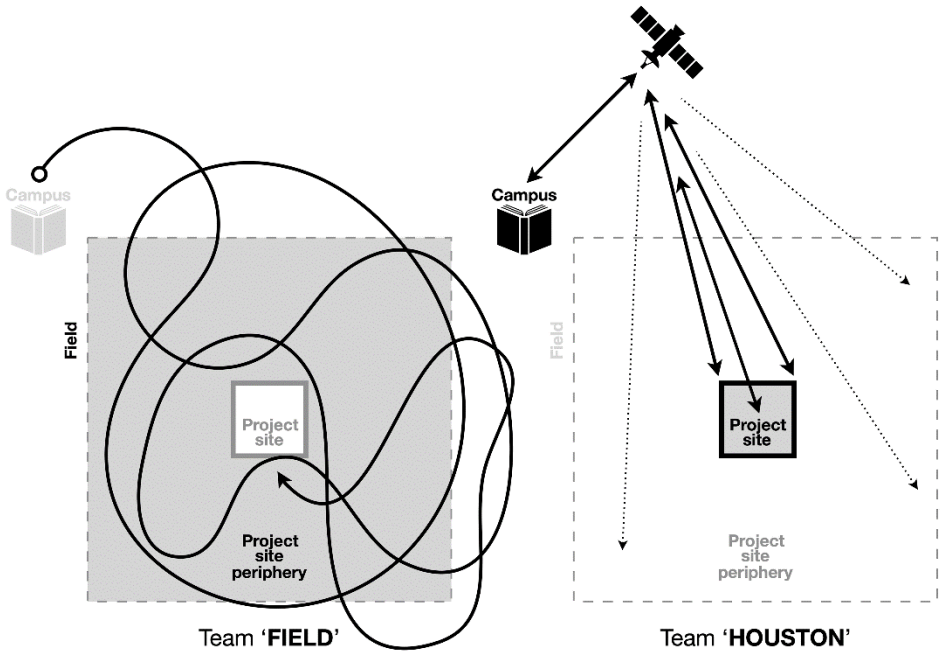

Fig. 2: Convergent digitality: Team 'Field' does without a straight front door approach. Instead, they practice predominantly tangential, considerate, spatial approximation

and presence (left). Team ‘Houston’ simultaneously works in a ‘ground control’ function, in the VR-Lab, home on campus (right) (Graphics: J. Rekittke, 2020).

2) We deliberately replace immediacy by tangentiality (Fig. 2). Spatial remoteness often allows a closer approximation to obstructed project sites than in situ presence may do. Instead of seeking direct contact with problematic areas, we, first, use remote sensing as well as online-accessible information as surrogate data. We try to be as tangent to the project site as possible and stop unsolicited in case of discernible opposition or potential breach of research-ethical norms. If nothing speaks against reaching and operating in the proper project site, we will go ahead. Our maxim implies goal-orientedness without inappropriate directness.

3) Not only due to the institutional, ecology-minded default, that traveling may not be obligatory for students in the future, we refrain from the assumption that all participants of our studios or projects will or can be present in the field, for fieldwork. As a basic principle, we plan for having a field team on site (Team ‘Field’), and, at the same time, having a second team in a ‘ground control’ function, home on campus. To this group, we refer to as Team ‘Houston’. We consider two persons in the field, either staff or students, as a minimum requirement for adequate operationability and the provision of expert testimony and ground-truth. Real-world problems make real-world contact and experience indispensable.

Fig. 3: ‘War Room’ for the Columbia Pictures movie ‘Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb’, 1964. The movie set had been designed by Ken Adam (Image: Columbia Pictures, 1964).

4) We intend to max out the potential of the local VR-Lab for global design work and understand it as an effective control room for design operations beyond direct proximity. The canon of applicable software and online systems ranges from advanced 3D VR applications to common and free tools like Google Maps. The visual capacity and digital connectedness of the lab allow exigent preparational remote sensing efforts in inaccessible places. For good reason, it was a designer – the movie production designer Ken Adam – who drafted the imaginative ‘War Room’, a cinematograph icon of a control room, where remote action is monitored and related decisions are made. The room was implemented for the movie set of ‘Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb’ (Fig. 3).

6 Interchange of Proximity and Remoteness

A contemporary VR-Lab operated by a school of landscape architecture can be understood and used as a control room for planning and design purposes. How meaningful remote information processing, decision making, and action in such facility can become, had been demonstrated by the Apollo 13 crew and Mission Control in Houston (Fig. 4) during the Apollo 13 mission in 1970. After an oxygen tank failed, the crew was forced to transfer from the command module to the lunar module, where, due to incompatibility, the unavailability of lithium hydroxide for removing carbon dioxide from breathable air presented a life-threatening problem (POTHIER 1970).

Fig. 4: Left: Mission Control, Houston, April 13, 1970 (Photo: NASA). Right: VR Lab at NMBU, Norway, 2019 (Photo: J. Rekittke).

Mission controllers began to tinker a do-it-yourself gadget that finally facilitated the necessary drop in the carbon dioxide level on board. The procedure to build the device, read up to the Apollo crew by Mission Control – was a key example of cooperation between ground and space (POTHIER 1970). Our assignments lack equivalent drama, but the historic example teaches us an important lesson. The hand in hand collaboration between a field team, on-site, and a control room crew, on campus, may result in significant additional benefit. The control room we use is the VR-Lab in Norway.

Convergent digitality countervails shortfalls of on-site information or data. In the case of the design assignment for the refugee camp in Moria, it forms an inversion of the common gearing of remote sensing efforts and fieldwork execution in landscape architecture. Spatial immediacy is replaced by tangentiality, and spatial remoteness allows a closer approximation to the project site than in situ presence may do. While, in the normal case, the fieldworker gets into immediate contact with the core site, and uses remote sensing information merely as added context information for the periphery, on Lesvos island, in the sensitive context of refugee camps, a field team explores the terrain around the camp, learning as much about the terrain as possible and investigating issues and ideas raised by the ‘Houston’ team working remotely via real-time communication (Fig. 2). Due to the situational political and emotional

tension, conspicuous measuring, photography, and even drawing and note-taking have to be widely replaced by remote information mining. The following, typically field-operated design steps, can be effectually compensated by control-room-operated action:

1) The sufficiently precise determination of existent ground-level elevation and measuring of virtually all relevant terrain and building attributes. Millimeter accuracy is mostly not necessary in the course of academic design studios in landscape architecture, thus the available tools in Google Maps and Google Earth are thoroughly suitable for almost all measuring purposes – location, elevation, dimension, etc. Google Maps offers up-to-date, seamless, high-resolution satellite imagery, aerial photography, street maps, 360° panoramic views of streets (Street View), real-time traffic conditions, and route planning. Google Earth renders a 3D representation of the planet, maps the Earth by superimposing satellite images, aerial photography, and GIS data onto a 3D globe (WIKIPEDIA 2020). The publicly available and ready to use Google globe (Maps and Earth) has to be regarded as a serious substitute for a significant quantum of time-consuming on-site operation. For the building of the terrain and location model in the Moria project, we will exclusively use data that can be extracted from Google Maps, Google Earth, and OpenStreetMap.

2) The deep, though preliminary and merely visual reconnaissance of developed as well as pristine landscapes worldwide. This is what the CIA and finally Google developed the digital globe for, and its cross-societal specific efficiency can't probably be beaten by any other tool or system in the world. Already released in 2001, and since then usable "[…] as a (Not Just) Geography Education Tool" (PATTERSON 2007), it still needs calm and ample time to travel digitally with Google. The worthwhile but time-consuming act of exploiting and profiting from the powerful functionality of the system forms a factor (on workload) that has to be incorporated in design studio didactics and curricula. Digital reconnaissance most likely will evolve into a serious cause in the context of institutional sustainability efforts and flight-travel minimization.

3) The comprehensive study of contextual site information. A plethora of images, maps, texts, press reports, professional and private videos, etc. are available online. There is hardly a detail of any event or place that has not been recorded, commented, or explained by someone before, and published online. Alone the trivial assortment of YouTube, the American video-sharing platform that is online since 2005 (youtube.com), makes up a wide-ranging source of work-relevant information, respectively second-hand testimony. Such unedited cornucopia of public visuals has to be handled with particular caution, but the crowd-sourced material normally has utilizable information for the designer. Watching the former professional coverage of the Moria camp on Lesvos, meanwhile inaccessible for camera teams, is a valuable undertaking. The documented conditions in the camp have not much changed, and the problematic situation has not been critically improved, thus we can see things via video that we won't be able to see in the field anymore. Original evidence is generally better than any piece of second-hand information, but our students should always incorporate the best information they can get at a time, into their decision-making process.

7 Conclusion

As long as we are rendered able to find the basic problems, essential requirements, relevant sizes, and numbers, as well as the plurality of design-relevant specifications of landscape,

topography, ecology, and culture, we are able to tackle any imaginable landscape design assignment in the world. Convergent digitality provides rather qualified overviews than specific insider perspectives, it rather allows for generalizable and scalable design-relevant information than for small-grained exactitude. The approach is made for gaining sufficient contextual insight for the successful delivery of serious results and not the fascination with technical attention to detail and resolution. As outdoor designers, interested in contested landscapes and territories, we have to learn to appreciate the abundance of publicly accessible information and exploiting it for informed and meaningful design work.

We like to close with an example of the double-edged nature and mutability of the interconnectedness of on-site presence and remote sensing. Who wanted to count and draw the tents and containers of the refugee camp in Moria, or trace the crown of every single olive tree on-site, could easily do that by zooming in on Google Maps or Google Earth – before April 2nd, 2019. Sometimes after that date, the area had been pixellated for the time being (Fig. 5). We don't know the exact reason for that.

Fig. 5: Google Earth aerial photos of the Moria migrant campsite on Lesvos island in Greece. Until April 2nd, 2019, every single tent and olive tree could be seen (left). Sometimes after that date, the imagery had been garbled (right) (Images: Google Earth 2019).

Since then, one had to rely on the remaining digital cornucopia in the form of professional press footage, drone flights by all kinds of amateurs, image material sold by stock photo companies, as well as on personal visits. In the case of the Moria design project, the garbled area is rather negligible. An adequate camp for the actual number of refugees will take up the multiple of the pixelated space and will be situated in the visible landscape around it, if not in a completely different and much better location.

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