**WORKSHOP “POWER AND SPACE IN THE DRONE AGE”, Neuchâtel University, 27-28 August 2015**

**List of Abstracts (order following the conference program)**

**KEYNOTE 1: *ASSEMBLAGE OF VERTICAL: COMMERCIAL DRONES AND ALGORITHMIC LIVES***

*Jeremy Crampton, University of Kentucky, US*

This presentation provides a critical analysis of recent developments in the commercial and civil market for unmanned aerial systems (UAS, or drones). While significant attention has been paid to military uses of drones, the civil, commercial and public safety deployments have not been well attended to. I provide an overview of developments in the commercial and civil drone sector, including potential market size, the variety of applications and uses, and the regional geographies of production and research.

I argue that we should understand the commercial drone as assemblages of discursive, legal, regulatory and material practices that are forming a new market. This market should not be understood as drones simply emerging from the military to the police, but rather as Neocleous following Foucault has noted, as the continuation of forms of neoliberalization. I argue that this ties in to a whole history of calculative governance to produce better information to solve societal problems. In geography this history constitutes a research agenda around “care of the information” for mapping as technologies of government. Today, algorithms, Big Data and drones are colonizing the vertical as an economic zone for the extraction of value from the sky, or from the earth via the sky.

My argument is underpinned by interviews conducted with US government experts, a geospatial lawyer, and the Director of the Association Unmanned Vehicle Systems International (AUVSI) which lobbies for commercial UAS. These interviews, along with access to a proprietary market analysis by the Teal Group on global drone market, provide new insights into assemblages of the vertical, and how commercial drones produce algorithmic lives predicated on the extraction of data as value. I conclude by asking if these new algorithmic approaches are more egalitarian, and what they might mean for privacy and subjectivity.

**SESSION 1: THE MAKING OF THE DRONES**

**Trade spaces of the commercial drone**

*Anna Jackman, University of Exeter, GB*

*“There are people who want to study the transformation of technological objects without worrying about the engineers, institutions, economies, or populations involved in their development. The theory of evolution can take such people for a ride!” (Latour 1996: 2)*

Following Latour, this paper considers the trade sphere as a possible lens through which to consider commercial unmanned technologies. Trade exhibitions or expos are key hubs of commercial and civilian drone activity. Alongside extensive mazes of platform stalls and advertisements, these trade events bring together industries and policy‐makers, advocate groups and hobbyists, in discussions about the application, regulation, and potentiality of this emergent technological field. Exploring this distinctive landscape thus provides a unique window into understanding the knowledges, currencies, and imaginations facilitating the proliferating sale and usage of the commercial drone. With reference to empirical material, this paper seeks to critically explore the trade space in terms of the mechanisms through which the drone is visually, materially and discursively understood and retailed in this environment. Through interrogating the trade space, one facilitating the ‘functioning’ and growth of commercial and civilian drone use more widely, this paper thus seeks to explore *how* the spatialities of the commercial drone are made possible.

**The power relations and political economy of UAVs**

*Ciara Bracken‐Roche, University of Toronto, CA*

As drones proliferate in the domestic realm, various stakeholders shape the technologies as well as the policy and regulations that govern their use. One way to address this gap in research is to compare UAV‐related policy and public opinion data on UAVs. So far, the research shows that Canadian UAV regulation is being driven by a particular understanding of public opinion on drones by key stakeholders, an understanding which believes the public to lack awareness and understanding of UAVs, and one that allows key stakeholders to steer things in their own interest. This work comes out of my PhD research and I will focus solely on the Canadian data for the purposes of this presentation.

In examining the rise and use of UAVs within Canada’s domestic realm, this work assesses the extent to which various agencies, companies, government and publics that have emerged potentially shape UAVs and the UAV market but also how perceptions, support for, and understanding of UAVs subsequently shape policy and regulation around these technologies. A key question for academics and regulators is this: are these technologies are unique as surveillance technologies? UAVs can combine a number of surveillance capabilities in the one machine and they have attributes of varying size, aeriality and remote operation; all of these things lead to changing regimes of visibility. All of these qualities are important because they help inform us of the potential ramifications of UAVs in the domestic realm for concerns such as civil liberties, human rights, and privacy.

**KEYNOTE 2: DRONE CITY: POWER, DESIGN, AND AERIAL MOBILITY IN THE AGE OF ‘SMART CITIES’**

*Ole B. Jensen, University of Aalborg, DK*

In this paper I want to address the phenomenon of ‘drones’ and their potential relationship with the city from the point of view of the so‐called ‘mobilities turn’. I want to do so in a way that turns attention to a recent re‐development of the ‘turn’ towards design. So the emerging perspective of ‘mobilities design’ will be used as the one background perspective to reflect upon the future of drones in cities. The other perspective I propose to frame the phenomenon with is the emerging discourse of the ‘smart city’. Here I must distance my use of this term from the mainstream business discourse (i.e. IMB, Cisco, Siemens, and other ‘off the shelf technical fixes to the smart city’) as well as the policy framing which often seems high on words and low on content. Here the ‘smart city’ is a descriptive term trying to capture an urban condition we may characterize as ‘feedback urbanism’ where all sorts of data are being produced, gathered, mined, scrutinized, and disseminated (fed back) by and to machines as well as humans. The contemporary city has gained new layers of data that may be harvested by commercial partners, government bodies, civil society, NGOs, criminal gangs, or any other sort of institutional agency. Such a city of proliferating digital information and data communication may be termed a ‘smart city’ as shorthand for a new urban condition where cities are networked and connected (as well as disconnected) from the local block to global digital spheres. In the midst of many of the well‐known data‐creating devices (e.g. Bluetooth, RFID, GPS, Smart‐phone applications etc.) there is a ‘new boy in class’ that potentially will be a game‐changer for urban governance, economics, and everyday life. Here I am thinking of the unmanned aerial vehicle or ‘drone’ as the popular term has it. So I want to ask how life in ‘drone city’ may play out? Drones may alter the notion of surveillance by means of being mobile, as well as they profoundly alter the process and perspective of data collection and feedback to governments, businesses, citizens etc. The ‘mobilties turn’ and the notion of mobilities design offer a particular analytical framework in order for us to address life in ‘Drone City’.

**SESSION 2: SPATIAL GOVERNANCE**

**Spatialities of aerial surveillance: A critical study of border control by military drones in**

**Switzerland**

*Silvana Pedrozo, University of Neuchâtel, CH*

Today a variety of surveillance technologies are increasingly being used by public authorities to observe and control national territories. In Switzerland, this technology has firstly been used for various purposes such as observation, mapping and training missions since the beginning of the twenty‐first century. However, military drones are now mainly associated with new military interests and surveillance strategies. Military drones are now commonly used to manage and survey borders and cross‐border regions. In this context, military drones imply new geographical, political and security strategies for these actors, which redefine aerial surveillance and control practices on the ground.

In this view, the objective of this paper is to explore empirically how contemporary surveillance and control practices through military drones participate in, and affect, the management of Swiss border regions. More specifically, the article, firstly, offers a broad discussion of three interrelated spatial logics that characterize drone surveillance, relating to the fundamentally (1) mobile, (2) vertical and (3) adaptable gaze on space offered by the technology. Secondly, the paper draws upon the Euclidian vocabulary of points, lines and planes to show how exactly drone surveillance is articulated spatially in the explored case study, and how in turn this affects not only the exercise and spatialities of border control but also the very understanding of the border itself by the involved drone users, as both a ‘linear national boundary’ and as a wider ‘border area’ to monitor and manage.

The empirical insights from Swiss public authorities relating with the use of military drones in border areas provides access to drone’s itineraries and control practices in border areas. The set of empirical data contributes to a deepened understanding of the use of this technology for surveillance in Swiss cross‐border regions.

**Drones for justice. Inclusive technology and river‐related action research along the Kapuas, Indonesia.**

*Irendra Radjawali, University of Bremen, DE and Oliver Pye, University of Bonn, DE*

This paper discusses the potential of using drones for community based counter‐mapping. The findings are based on an action research project on the political ecology of the Kapuas River, in West Kalimantan, Indonesia (2011‐2015). By using open source information made available by the web community of drone builders, we were able to reduce the cost of constructing the drone to below 500 USD. By “rendering political” the drone technology and embedding it within action research, citizen research groups (CRGs) were able to appropriate a technology of control and use it to further environmental justice. In the first case we discuss, in an Iban village adjacent to a national park in the upper reaches of the Kapuas, the CRG used images created by the community drone to apply for customary forest status, which would give them greater control over their forest resources. In the second case, small‐scale farmers near Sintang used the drone technology to counter their criminalization by a palm oil company. In the third case, communities impacted by a large bauxite mining operation in Tayan in the lower reaches of the Kapuas were able to prove that the mining operation had extended beyond the concession area and that the company had laid an oxbow lake dry by diverting a Kapuas tributary. The politicization of the latter case went far beyond the local scale when evidence provided by the community drone images was used in an NGO intervention into the provincial spatial planning process and when a Tayan community representative gave testimony to the Constitutional Court in a hearing on Indonesian national mining policy that is being challenged by multinational mining corporations. Such were the political ramifications of the “community drone” that the art of building and using drone technology for environmental justice movements is now being replicated and shared amongst several activist and NGO organizations in Indonesia.

**KEYNOTE 3: UN*MAN*NED, AERIAL AND VEHICULAR**

*Peter Adey, Royal Holloway University of London, GB*

There have always been drones, but they used to be different.

In this paper I try to move the drone off‐centre somewhat, to consider the drone in a wider context of perspectives of the figure of the levitator in history ‐ a pre‐history if you will, of drones and flight.

In what I appreciate is an odd move, the paper moves with the conviction that it is possible to look back at the drone from other points of view, from registers that are also techno‐legal and scientific, but predominantly theological, elemental, mythological and magical (see Dorrian 2014).

The levitator denotes different kinds of assemblies of networks of relations from those that hold the drone up; alternative forms of scientific and military expertise and cults of authority; diverging performances of gender, passivity and submission (levitators do share the gender ambiguities of drones); just as direct invocations of sovereignty posited between heavenly and earthly powers; techno‐orientalist constructions mediated by moving image; truth claims centred, re‐centred and confused not from a wider assembly of sensing things (see Gregory 2011 more recently), but juridical testimony of their very existence; economies of public display and spectacle (contra Crampton and Ruddick 2013); and remote projections of will, as the subject is pushed out from their own body by sovereign or spiritual ecstatic possession, as opposed to operators virtually pushed‐in to a battlespace. The levitator is a remotely piloted (neo‐platonic) vehicle.

Whilst there might be some profit in an ironic and cynical ridiculing of the drone, it is not the intention of this paper to denigrate what is at stake politically by aligning drones with the curious subject of the levitator. Instead, the levitator might be a way to unlock the drone as a figure in a far wider context of delegated aerial presence in the cultural, scientific and spiritual imagination.

Furthermore, as we begin to understand the means by which the levitator has been enrolled within other radical political projects (as much as it was a foil for exploitation), from peace rallies to emancipation, perhaps the levitator offers some hope for the drone.

**SESSION 3: VISIBILITIES**

**Volumetric (h)overview: The progressive geography of aerial view in motion**

*Synne Tollerud Bull, University of Oslo, NO*

As Unmanned Aerial Vehicles (UAV), commonly referred to as drones, are rapidly becoming ubiquitous, we are getting acquainted with new ways of seeing. New, aerial moving imaging technologies have prompted scholarly discussions on what has come to emerge as a new visual paradigm (Elsaesser 2013, Dorian 2013, Steyerl 2012, to name a few). Many scholars have pointed to the increasing importance of aerial views prompted by new technologies of surveillance, tracking and targeting such as Google maps, drones, and satellites. Others have called for a more systematic study of camera movement impelled by the spatial configuration in digital cinema (Gunning 2013, Brown 2013, Morgan forthcoming). My interest lies in weaving together these two threads of recent research in order to frame an updated account on the spatial aesthetics of the aerial view in motion produced by Civilian UAVs uploaded to social media networks such as dronestagr.am, and travelbydrone.com. These aerobatic “establishing shots” from around the world, I will argue, closely align with Tom Gunning’s (1986) notion of the “cinema of attractions” identified in early cinema and travel film, as they both explore and contribute towards a new mediated spatial logic.

Most notably, the continuous remote‐sensing, CGI‐like screen space produced by drone cameras redirects our sense of geographical space from areas into volumes. Drawing on the emergent literature on vertical geopolitics, spheres (Sloterdijk) and tunnels (Virilio), Stuart Elden (2013) rejects the common conception of two‐dimensional territory in favor of a volumetric three‐dimensional vertical hierarchy of atmosphere, ground and sub terrain. In my essay I will use Elden’s volumetric thinking to further articulate the screen spatiality enabled by civil drone vision. As future UAVs are likely to be fitted with night‐vision, see‐through imaging, and video analysis software, they both respond to and inculcate this sense of volumetric screen space, with corollary effect on our common conceptions of physical geographical space.

**Watching the watchmen: Drones at protest**

*Neil Waghorn, University of Aberystwyth*, *GB*

Unmanned Aerial Vehicles (UAVs), or drones as they are also known, having crossed from the military to civilian sphere, are increasingly being used to record footage of events and occasions ranging from sports and firework displays to natural disasters. Amongst an ever growing collection of aerial videos published online are a range of videos showing aerial shots from protests from around the world, from Hong Kong and Thailand to Poland, Ukraine and the US. These videos, from UAVs operated by protestors and journalists, portray protests from an aerial perspective that was previously reserved to expensive helicopter flights, which face a range of limiting factors including weather and permission to fly. The presence of (relatively) inexpensive civilian UAVs in the airspace above protests represents a practical democratisation of access (regardless of legality of their actual presence). This democratisation of access above protests poses a range of questions for implications on the ground, which this paper seeks explore.

Taking the UK as its case study, the paper explores the potential of UAVs to monitor, record and relay information about police movements to protestors on the ground, and the subsequent impact on operational security, surveillance, power relationships, self‐regulation and accountability. In exploring the impacts of UAVs at protests the paper utilises a range of security and surveillance literature as well as engaging with a selection of Foucauldian concepts, ranging from governmentality to his engagement with Bentham’s panopticon. As well as exploring the impacts of UAVs, the paper will establish the regulations and legislation governing the use of UAVs at protests and their limitations. In light of the limitations of enforcing UAV legislation, the paper will also explore the options that police could potential take in order to mitigate or transcend the presence of protestor UAVs in the airspace above protests, such as attempting to arrest UAV operators or jamming signals.

**KEYNOTE 4: DRONE WARFARE AND THE ENCLOSURE OF THE PLANET**

*Ian Shaw, University of Glasgow, GB*

This paper explores the underlying conditions that nurture and enable drone warfare. A great deal of work has emerged in the past few years that takes seriously the drone as a crucial technology for transforming military violence, challenging international law, and reconfiguring the spaces of surveillance and risk. However, less attention has been paid to what I’m calling the “existential structures” that were already in place to enable the drone’s emergence as a “western” way of waging war‐‐as a symbol of ultra‐rational killing. In other words, while there is a plethora of work on the philosophy of the drone, there is less work on the underlying philosophical conditions of the drone. Understanding this difference may prove crucial to how we approach and talk about the drone.

This paper argues that “enclosure” is a term that encapsulates the ongoing project (one that is a hallmark of the modern age) to bring the planet’s restive populations‐‐at home and abroad‐‐under constant surveillance and pacification. Building upon my previous work that argues that U.S. drone warfare can be understood as a “Predator Empire,” here I outline, in more detail, the biopolitical conditions that underpin the spread of drones as tools of (domestic) policing and violence. Crucial to this endeavor is thinking through the logic of “topological spatial power,” which folds the planet’s surfaces into borderless forms of computational control. The paper takes seriously the notion that while “war” may indeed never be the same again in the age of the drone, a more pervasive form of “social war” nonetheless continues unabated, carrying the torch of historical acts of enclosure and violence.

**SESSION 4: MILITARY DRONES**

**From the 'everywhere war' to the 'everyday war': The exceptional and quotidian geographies of drone strikes**

*Kyle Grayson, University of Newcastle, GB*

Critical approaches to political geography have made a valuable contribution to understanding how drone warfare becomes possible; however, there has been an inadvertent focus on the exceptional spaces, places, and actions that are constitutive of what Derek Gregory(2011) has called the 'everywhere war'. This paper argues that it is also critical to examine the quotidian geopolitical places that make the everywhere war an 'everyday war'.

Two related places that represent this quotidian geopolitics are advanced. First, are sacred places and how these are problematized within the counter‐insurgency doctrines being used to administer and guide drone strikes. Second, are homes. Using content analysis of alleged CIA drone strike sites and transcripts of eye‐witness testimony, this paper demonstrates how drone strikes have undermined the sacred qualities of the home in theatres of counter‐insurgency. The significance of these findings are that they reveal an additional strand of culturally infused politics produced through targeted killing and drone warfare: the desecration of the home as sacred place.

**Panopticism and the human experience of invisible predators**

*Afxentis Afxentiou, University of Sheffield, GB*

The notion of drone surveillance being systematically exercised in a ‘Western’ spatial environment is certainly disconcerting. This disconcert is hardly surprising; rather, it is a result of how power control via drones has already being exercised *in extremis*, mainly in the form of drone bombing in non‐ Western spaces. Because of this connection, the issue of drone bombing is relevant even when discussing non‐military uses of drones. Indeed, the context of drone bombing provides a stark exposition of the potentiality of drones to be an apparatus that radically re‐defines power relations in the space within which it operates. So, even though drone bombing might appear unnecessarily dystopian in the context of drone usage in Western liberal societies, it can nevertheless be used as a paradigm to explain the processes through which the use of drones can affect spatial control. Not only that, but a re‐imagination of drone bombing in spaces where such use might be considered as obscenely pervasive and threatening, cannot help but beg the question why such use is deemed as more problematic in certain territories than in others. Arguably, this approach may contribute to a more comprehensive understanding of the human experience of drone bombing.

In this context, this paper will present a description of drone bombing through the concept of panoptical control. Inspired by Jeremy Bentham’s Panopticon prison design, panopticism was further elaborated by Michel Foucault in an attempt to analyse power relations for disciplinary control.

Indeed, the notion of invisible, omnipresent observation ‐ coupled with certitude of punishment for any transgression of the rules ‐ can be strongly linked to how drones and drone bombing is experienced from the ground. Such understanding has two main implications. First, that the temporal dimensions of drone bombing extend far beyond the moment of physical violence, to include times where such violence might not take place but is anticipated by the population below.

Second, it offers an account of the spatial transformation of that territory which often means a reconfiguration of the identities of local populations to fit the political expediencies underpinning the use of drones.

**Soundscapes and touchscapes in the occupied Palestinian territories: Affective spaces in the drone age**

*Ariel Handel, University of Tel Aviv, IL*

This paper will explore the sensual geographies of Palestinians in the Occupied Territories in the shade of the extensive use of surveillance and attack drones. The argument I intend to formulate will be threefold. (1) The condition Israeli occupation creates is one of deliberate and chronic uncertainty penetrating all levels of life among the occupied population. This serves as a means of control by creating a permanent state of fear and uncertainty, based, among other things, on breaking the relation between presenting the instruments of violence and using them. (2) An important part of the status of uncertainty rests on the asymmetry in what might be termed (following Jacques Ranciere) the distribution of the sensible; namely on who is the one who can see, hear and touch the other, and under what conditions. (3) These relations create distinct soundscapes and touchscapes that, although un‐mappable (or, because being un‐mappable), have an extensive impact on the lives and on the spatial organization and daily activities of the occupied. The paper will attempt to contribute to the research of space and power, of the Occupied Palestinian Territories and to the theoretical fields of emotional and non‐representational geography.