



# Mobile Augmented Reality Game: The Convergence of Physical and Virtual World to Develop a Regime of Property Rights in Augmented Reality

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## Abstract

Mobile augmented reality game such as *Pokemon Go* has created a way to merge the virtual and physical world. The convergence of physical reality and augmented reality post serious challenges to the long-established theory and concept of property law. The fundamental question on the extent of private property owner's right in his property and the legal implication of placing intellectual augmented objects (*Pokemon* characters) in physical private property needs to be answered. Mobile augmented reality game is complex and the law that deals with land or intellectual property are unable to provide any recourse for its invisible intrusion in real physical property. The right-based property theory that defines property as property rights could clearly define various rights and interests of a private property owner and those rights and interests are not only confined to physical or virtual world. It applies to both. The significance of having asset of well-defined property rights in augmented reality, it allows us to observe the metaphorical interaction of various rights belonging to the parties in the augmented virtual world and in the physical world. This would greatly facilitate the process of identifying and to develop a regime of property rights that that is required in view of this fast-emerging augmented reality and advancement in technology.

**Keywords:** Mobile Augmented Reality Game, Property Rights, Bundle of Rights Theory, physical reality, technology, intellectual

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## INTRODUCTION

*Pokemon Go*, an addictive mobile augmented reality game has taken the world by storm with millions of players. There are many cases arising from this mobile augmented reality games on the issues of trespass and other infringement such as inundation of church façade with offensive digital message. This game merges physical reality with intellectual augmented objects. It poses serious challenge to the long-standing theory and concept of real property law. It has raised the concern on the rights of real physical property owner over his own property, not only in the physical context, but in virtual aspect. Some of the fundamental questions need to be addressed such as what exactly the property owner's right is and are those rights extended in augmented reality. Writer such as Declan T. Conroy support the proposition that it is necessary to recognize owner's property

rights in augmented reality. However, the recognition of property rights is merely the first step. Real property owners should be given a default set of legal rights of their properties in augmented reality. These legal rights would protect property owners' interests in digital space that are linked with their properties. Many assume that property law is unable to resolve this intangible intrusion of private property [10]. However, such assumption has under mind the flexibility of existing concept of property and property law. The objective of this research paper is to assert that the right-based concept of property is able to deal with and resolve intangible intrusion in augmented reality and to formulate a default set of legal rights for property owners in augmented reality with the bundle of right theory. With clearly defined rights, this can facilitate the process of developing a body of rules to regulate the

various metaphorical interactions between the parties, not only involves in this mobile augmented reality game but in other applications involves augmented and virtual reality as well. The discussions of this research paper will be divided into the following manner:

- Part I—The meaning of augmented reality, Pokemon Go and its legal challenge
- Part II—The extent of owners' right in property
- Part III—Bundle of Rights Theory and Exclusive Right of Use Determination
- Part IV—The proposed default set of legal rights for property owners in augmented reality and beyond

### **Part I—The meaning of Augmented Reality, Pokemon Go and its Legal Challenge**

The terms augmented reality and virtual reality are often used to describe a form of virtual environment. Augmented reality and virtual reality are similar in many aspects. Both have remarkable ability to alter our senses and perception of our world. However, virtual reality is able to transpose the user to a different dimension while augmented reality does not take us to a different dimension. It takes our current reality and adds something to it. It simply 'augments' our current state of presence.

In 2016, the world of the augmented reality has taken the center stage in the form of a game, called Pokemon Go. This was the first major example of augmented reality gain mass market acceptance that affect our daily lives. This augmented reality game encourages users to venture out into the real world to catch Pokemon characters. It's a mobile game which insert an augmented layer of Poke-Content on top of a Google map interface program. This allows players to use their smart phones' GPS and the camera. Players with their Google account 'walk' or 'run' through this augmented world to find Pokemon to "catch them", train them and battle against other players. These games take players to various locations which include private property such as churches, residences and homes.

The immediate popularity of this game has raised several concerns in relation to privacy and property issues. As of July 13, 2016, it is with a starting peak of over 28.5 million users who find themselves intruding into private spaces in search for virtual Pokemon characters during the game, it has become a serious concern for property owners. There have been many legal lawsuits initiated in relation to trespass to property. For example, a New Jersey man has filed a lawsuit in California Federal Court against Niantic Labs and Nintendo complaining about Pokemon Go players catching monsters in places like the Holocaust Memorial Museum and alleged that the game makers did actively invite "unwanted incursions" into private property when they populated reality with augmented reality monsters [11].

Where Pokemon Go characters are placed and attract players to enter into private residence and home, it raises the question of trespass and other legal issues that may affect the rights and interests of affected private property owners. Although the issue of trespass is one of the most obvious and common issue that need to be dealt with, however, the implication from this mobile augmented reality game is far more than just concerning with trespass into private property. It leads us to explore the extent of owners' right in property. Is the owners' right in property merely confine to physical enjoyment or it can go beyond that?

### **Part II—The extent of Owners' Right in Property**

People can only see or interact with Pokemon characters through mobile phone or electronic device. The question is does placing a Pokemon character on the augmented layer of a private property without permission affect the owner's interest in property? Many would argue that placing a Pokemon character on a private property without permission does not affect the owner's interest in property at all because of the following reasons: (a) physical world and virtual world do not interface with each other and they exist separately, (b) virtual cartoon character can only be placed at the private property temporarily, (c) virtual cartoon character can only be viewed in hand

phones or mobile devices using the gaming and GPS programs. These reasons provide an over simplistic view of this mobile augmented reality game and in fact, they are based on the 'physicalist' concept of property that what happen in virtual world has nothing to do with physical world. This proposition is not true in the context of augmented reality as it has emerged with real physical property. An analogy can be drawn from the discussion and recognition based on air space rights, aerial photograph and the recognition in the right in spectacles. Air space rights are a form of property interest in the "space" above the earth's surface. Generally, owning, renting land or a building includes the right to use and develop the space above the land without interference by others. In the case of *Anchor Brewhouse Developments Ltd v Berkley House Ltd* [1987] EGLR 172, the Defendant's crane over sailed onto the Plaintiff claimant's airspace above their land on a regular basis during the construction of a housing development. No damage has been done but it was held that the claimant was entitled to have an injunction to prevent the trespass. A landowner is entitled to the exclusive use and enjoyment of his or her land. Hence, property rights of the owner or occupier extends to the use of airspace above the ground and is necessary for the proper enjoyment of the surface. The artificial projection, a crane swinging over the neighbour's land, an object entering into the neighbour's property airspace is considered as direct invasion as there is some form of 'physical entrance' occurred.

However, contrast this case with the case of *Bernstein v Skyviews & General Ltd* [1977] EWHC QB 1 High Court. In this case the Defendant company took aerial photographs of properties and offered them for sale to the owners of the properties. The owner complained that the photographs were taken without his consent, hence it was an invasion of privacy and the photo had been obtained by trespassing onto his airspace. It was held that there was no trespass on the basis that a landowner only has rights in the airspace to such a height as is necessary for ordinary use and enjoyment of the land. The generally

accepted view is that "the eye cannot by the laws of England be guilty of a trespass".

In the case of *In re Penny and the South Eastern Railway Co.* (1857) 7 E. & B. 660, 671, 119 E.R. 1390, 1394, Wightman Justice stated that:

"[t]he line must be drawn somewhere." The "comfort and value" of the property overlooked might have been diminished, but it was "impossible to know where such claims would end ..."

And in the case of *Victoria Park Racing and Recreation Grounds Co. Ltd. v. Taylor* (1937) 58 CLR 479 which concerned broadcasting race coverage by radio from a vantage point of structure located outside the racetrack without owner's permission. The issue was doing an owner have a property right in spectacles that take place on his land against people off his/her land? The majority has refused to give recognition of a new right (right in spectacles) as a new form of proprietary interest. Judges have taken a conservative approach and were not willing to give recognition to the novel proprietary interests in this case. In the dissenting judgement, Evatt J. thought it "an extreme application of the English cases to say that because some overlooking is permissible, all overlooking is necessarily lawful."

The above cases demonstrated that there is no clear principle as to the owner's right in property when the usage of the land is out of the ordinary such as interference of airspace or photograph taken from the air. The case of *Victor Park* attempted to clear the law, unfortunately the Judges were not willing to give recognition to new property interest probably on the basis that these rights are very abstract and they do not fit into the existing precedents of the laws. This problem of lack of recognition continues without proper legal recourse in all these years. Again, this problem has become a vital issue in the context of augmented reality game. In order to resolve the problem, whether it concern with the interference of airspace, taking photographs from the air or placing an intellectual augmented object, one need to seriously consider and examine the extent of owners' right in property virtually. Virtually here does

not simply means intangible but exist in a different medium or environment that coincide with the physical space. This new medium requires a new genesis of interests and rights that does not exist before and because of its novelty, due recognition should be given to those interests and rights in the legal context. In order to do that, we need to have a flexible and unorthodox notion of property concept that capable of accommodating those new rights, and this article suggest that the right-based concept of property, the bundle of rights theory is capable of giving due recognition to the new rights that exist in relation to the augmented reality game and virtual world.

### **Part III—Bundle of Rights Theory and Exclusive Right of Use Determination**

In the traditional concept of property, property rights were created by law that was attached to a physical property. The general perception was that people always placed more emphasis to the actual physical property rather than property rights. The property right is just a legal fiction to describe and to explain how property was utilised and controlled by its owner. However, in the bundle of rights theory, property rights were not just a legal fiction but were the basis and foundation of this legal theory [2].

Prior to 1880, property was mostly understood as a ‘thing’ owned and ownership means the owner’s dominion over the thing in terms of possession. Ownership entailed the corresponding duty on others to respect the owner’s dominion and not to mess with or interfere with the property. The bundle of rights theory only gained more attention in the age of expanding democracy and collectivism. In the culture of collectivism, [1] property was characterised as a “bundle of rights” rather than just a thing. In the bundle of rights, also known as the bundle of sticks theory, that there is no physical property existed. The property right or the stick in itself was property. That makes the bundle of rights theory distinct from other property theory. Bundle of rights was characterising property as a set of rights. Each of the rights in the bundle was independent from each other [2, 3]. Because of that, the bundle of rights theory

was able to subdivide rights and decompose privilege of use to various parties. This implicated that there is more than one individual that could hold or has been given a right in the property. The theory emphasised on concurrent and multiple ownerships as opposed to thing-based property concept that emphasised on a sole ownership in property.

In the bundle of rights theory, property meant ‘property rights. Each property right (or stick) would become a property on its own [3, 8]. When each stick in the bundle of rights is a property, removal of a stick from the bundle do not affect the remaining sticks in the bundle and therefore the removing of a property right was an independent act for alienation. Note that the bundle of rights theory does not classify property into different categories such as physical or intangible. Because of this, this theory can be applied to different type of property. Contrast this theory with intellectual property law in which intellectual property laws can only be applicable to property with intangible and intellectual characteristics.

Based on the bundle of rights theory, different people may hold different property rights simultaneously [3, 5]. What then makes a person become the owner of property? Many writers argue that a person who holds “the right to exclude” to exclude anyone from his property is the owner of the property. This is based on the notion of exclusion. In the thing-based concept of property, the notion of exclusion is important because in order for an owner to have the absolute right in property, all others must be excluded from the property. There are various writers such as Thomas W. Merrill and J. David Breemer as well as court decisions to support the notion that the “right to exclude” is considered as the most essential right in property and such right is the fundamental condition for a person to become an owner of property [13]. In the Supreme Court case of *Kaiser Aetna v United States of America* 444 U.S. 164 (1979), the District Court held that the pond was a ‘navigable water of the United States’, which was subjected to be regulated by the Corps of Engineers. However, it was further held that the Government lacked the authority to open

the navigable pond to the public without any payment of compensation to the owner. The Court of Appeal agreed that the pond fell within the scope of United States Congress's regulatory authority, but reversed the District Court's decision and further held that when the Petitioners converted the pond into a marina and thereafter connected it to the bay, it thus became subjected to the 'navigational servitude' of the Federal Government. In giving the public a right of access to what was once the Petitioners' private pond when the pond was connected to the navigable water in a manner approved by the Corps of Engineers, the owner had lost one of the most essential sticks in the bundle of rights that were commonly characterised as property — the right to exclude others. It was further stated in this case that the 'right to exclude', is held to be a fundamental element of the property right, which fell within this category of interests in that the Government cannot take without compensation. The Court considered the 'right to exclude' as one of the most essential stick in the bundle of rights that would commonly characterise the subject-matter as property.

The notion of exclusion is applied to physical property [4]. An owner can exclude anyone from entering into the property physically without his consent. An owner of an intangible property such as a website can exclude anyone from enter/access into his website without authorization. However, it is unclear whether a property owner can 'exclude' someone in the augmented reality of his property and how such exclusion could possibly take place because others need not to be physically present or require a password to enter into the owner's property [13].

It is argued that one should rely on the notion of exclusivity rather than the notion of exclusion. To a layman, both the words 'exclusivity' and 'exclusion' bear similar meanings which connotes restricting certain thing to a person or a group of persons. However, from the legal point of view especially in the context of property law, exclusivity and exclusion are two distinct notions and their legal implications and

properties are not to be confused with. A person become an owner is based on the notion of 'exclusivity' because in every property, there will be multiple users who have property interest in the property that belongs to others by recognizing that property can be utilized by multiple users. Therefore, the purpose of property law is not to exclude other users but to harmonise the interests of the others with the owner's special position of agenda-setting authority so that other users' interests are subservient to the owner right in property. This is the basis of the notion of exclusivity in which is to harmonise the activities of others with the owner's agenda. In essence, exclusivity rules regulate relationships of multiple users who have property interests in the property owned by others. The rules are for the purpose of rendering those interests consistent with the owner's position. Exclusivity rules protects ownership in property not through the exclusion of the others but through the principles of harmonising the interests of the others together with the owner's supreme position of agenda-setting authority [4].

To maintain the exclusive position of an owner, one has to show that the owner has the authority over the property. From the outset, the right to exclude seems to indicate the authority of an owner—the power to exclude non-owner from his or her property. However, the right to exclude is merely just one of the powers the owner possesses in relation to the property. In fact, the owner has more power in relation to property that he or she owned [4]. Whereas the special and exclusive right to decide on the use and access of property enable the maintaining of the exclusive position of an owner. This exclusive right encourages an owner to deploy his or her property to productive uses yet maintain his or her dominance over the property. The biggest threat to the owner's exclusive position is not the use of property by the others but is the use that is inconsistent with the owner's plan. Therefore, in order to preserve the owner's plan, it is not by ordering the other to stay out of the property but rather ensure the use and access of property is consistent with the owner's own plan and agenda. With that, it

maintains the owner's supreme and exclusive position without excluding the others from using and accessing the property. In the context of mobile augmented reality, owner of the property cannot literally exclude anyone in the augmented reality of his property as there is no physical boundary or password is required. However, an owner can exercise his exclusive position by either granting permission or rejection if the purpose of being present in the augmented space do not consistent with the owner's agenda.

#### **Part IV—The Proposed Default set of Legal Rights for Property owners in Augmented Reality and Beyond**

Does the owner of private property have the right to stop others placing intellectual augmented object or other intangible, virtual things onto his property without consent? [14]

If we refer to the above cases such as *Anchor Brewhouse Developments v Berkley House Ltd*, *In re Penny and the South Eastern Railway Co.* and *Victoria Park Racing and Recreation Grounds Co. Ltd. v. Taylor*, these cases recognized that there is some sort of abstract rights over physical property. However, the challenge lies in identifying those rights and the extent of such rights. We need to have the understanding of how augmented object, which is neither purely virtual nor purely physical affecting the owner's interest in his property. The identification of property interest will rightly facilitate the formulation of such right and the formulation of such right correspond with the needs to preserve property interest virtually. Hence, this paper proposes some of the rights to be included in the default set of legal rights for real property owners in mobile augmented reality game and other augmented reality applications as follows:

#### **RIGHT TO AUGMENTED SPACE**

If we refer to the owner's special position of agenda-setting authority so that other users' interests are subservient to the owner's right in property, this agenda-setting authority does not place any limitation on the position of the owner and therefore it can be strongly argued that regardless of whether in physical space or

in virtual space, the owner should have the agenda-setting authority. Furthermore, since this mobile augmented reality game is closely associated with the physical location, there is no reason why that the owner's agenda-setting authority should not be extended in the virtual space of his physical property.

However, one must also pay attention and identify the type of property involved. When the property involved is private, any interference with the owner's ability to deal with the property, which includes virtual world should be prohibited.

The owner of property has the authority to augment his own property the way he wishes or have the desire to have his property free from any augmentation. The situation will be more complex if it involves public property such as national park or public square. Ownership of public places is far more complicated than private property because public places are owned by the State. Individuals may have a better claim to augment public space than to other people's private spaces [15, 16]. However, the outstanding question is what kind of augmentation should be allowed in public place? The general rule is that augmentation that interfere with the intended use of the public space should be prohibited. Augmentation in the form of nuisance or something that does not benefit the public should therefore be prohibited [15, 16].

#### **RIGHT TO MANAGE AUGMENTED SPACE**

As stated above, the owner has the agenda-setting authority in augmented reality of his property. The agenda-setting authority is to make other users' interests subservient to the owner right in property. This is based on the notion of exclusivity which is to harmonise the activities of others with the owner's agenda. In order to achieve such harmonization with consistency of the owner's agenda, the owner of the property must be given the right to manage the various activities taking place in augmented reality too. The right to manage can further be divided into various rights such as the right to decide whether augmented objects should be placed in augmented reality

of his property; the right to decide which company should be given the permission; the right to regulate the placing of augmented objects such as what kind of augmented objects to be allowed, the timing and duration of the placement, how the augmentation is to be implemented and the right to transform the augmented reality application into resource that is beneficial to his property. Right to manage augmented space may be assigned to a company, for example Niantic Lab or Nintedo to manage the augmented reality on behalf of the owner. In the context of public property in which there are more than one owner, the right of management is a collective-choice right authorising its holders to devise operational-level withdrawal rights governing the placing and application of augmented reality of the property [17].

### **RIGHT TO IDENTITY, REPUTATION AND ASSOCIATION**

With the advancement of technology, we could possibly reach a point where it is not easy to distinguish between what is real and what is virtual while interacting through augmented reality or virtual reality. If this occurs, there is great opportunity for people to create distortion and mislead users of augmented and virtual reality. For example, imagine someone augmented a message virtually state 'Brothel' in someone's property. Furthermore, augmented reality could be used to create a digital doppelganger of someone doing something compromising or illegal in the property and all these activities raise serious concerns [17, 18].

When created augmentation that are likely to cause confusion, mistake, or deception as to the affiliation, connection, or association of such, this kind of augmentation should be prohibited unless they have been approved or consented by the owner of the property. Although reputation and business goodwill can be regulated under trademark laws, however, trademark mainly deals with commercial reputation [18]. There is a need to give due recognition to a person's identity, reputation and association. An owner of a family home does not want to associate himself with sexual activities or other illegal activities that affects

the identity and image of him and his family. The right to identity, reputation and association overlaps with the right to manage to the certain extend. However, the right to identity, reputation and association specifically deal with augmentation that give raise to negative image or create distortion and to make any untrue association and connection with the owner of the property which is detrimental to the identity and reputation of the owner.

### **RIGHT TO BE GEO-TAGGED**

Geotagging is a process of adding geographical information to various media in the form of metadata. The data usually consists of coordinates like latitude and longitude. Other information such as bearing, altitude, distance and place names may also be included. Geotagging is the most commonly used for photographs and can help people get the specific information as to where with precise location the picture was taken.

When a building has been geotagged and viewed through a smart phone, the relevant app augments a view with information about the building, such as height, coordinates and in some cases even the number of occupants. The questions arising is that—Is the company which carried out the geotagging have the right to disclose such information? The issue of privacy arises. It raises the question as to who actually owns the information in relation to a property or building, when and what type of information should overlay virtually onto a real physical object? At the moment, there is no specific law that regulates who owns such information or rights and therefore this paper suggest that those rights should be protected accordingly [16].

As the above-mentioned information is closely related to the owner of a property, the owner of buildings or property should own such rights on information that can make implication. By giving the owners the right to be geotagging, anyone or a company who wishes to geotag a building to first seek the permission from the owner and also disclosing the purpose and the type of information to be released to their targeted users [17].

## **RIGHT TO HAVE LOCATIONAL PRIVACY**

The Pokemon Go mobile game put an augmented layer of Poke-Content on top of a Google map interface program. The issue is whether the owner possesses the right to be mapped or right not to be mapped in the first place to prevent his property being mapped and identified on the google map.

Mapping is basically a process of extracting information and to provide detailed information on geographical regions and sites. In general, mapping is for the benefit of the public because it gives the exact and clear data on directions. With clear and accurate directions, it is not only saved travel time but also gas and money in travelling, it may be crucial in saving life whenever an accident occurs, or someone is waiting to be rescued. The law thus far has not recognized the right to be mapped as a form of property right because GPS coordinates of longitude and latitude are facts and public goods and therefore not subject to any private propertization [18]. If the law allows the right to be mapped as part of the bundle an owner possesses, it will undermine the public value in digital mapping.

However, the concern of mapping in the context of augmented reality is that of an owner of a property who wants to maintain privacy and prevent his private property to be mapped for the purpose of attracting players of mobile augmented game. What a property owner real concern is on the locational privacy in which the owner does not want others to capture the personal locational information such as by matching person and place, potentially sensitive information could be inferred such as people's work, health, recreation, family, sexual activities and daily routine [16].

## **CONCLUSIONS**

The potential for augmented reality goes well beyond gaming, and we can expect more augmented and virtual reality applications to be created in the near future. Augmented reality merges physical reality with intellectual augmented objects that posts serious challenge

to the concept of real property law and the position owner and his rights in property. It is time to give due recognition to the new genesis of property rights. Property owners should be given a default set of legal rights of their properties in augmented reality. This paper proposes five rights: right to augmented space; right to manage augmented space; right to identity, reputation and association; right to be geo-tagged and right to have locational privacy. These are merely some of the rights to be included in the default set of rights and the set of right should be non-exhaustive in nature. This paper also emphasis on the notion of exclusivity in which the purpose of recognizing those rights is to harmonising the activities of others with the owner's agenda. The notion of exclusivity protect ownership in property not through the exclusion of the others but encourage others to pursue their activities in relation to the property consistent with owner's agenda. With a set of well-defined rights, it facilitates the process of developing a comprehensive body of rules to regulate the various interactions between the parties, not only involves in this mobile augmented reality game but beyond.

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#### Cite this Article

Wong Wai Wai. Mobile Augmented Reality Game: The Convergence of Physical and Virtual World to Develop a Regime of Property Rights in Augmented Reality. *National Journal of Cyber Security Law*. 2020; 3(2): 28–36p.