

CODE SWITCHING IN MIXED REALITIES

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Abstract

The codes used in augmented reality (AR) systems may act as signifiers of an alternative reality in themselves, prior to any technological reading. Mixed realities in urban settings are complex media ecologies that are often traversed in a transmedial manner by players and participants. Making AR markers a significant part of the urban landscape, by aestheticising them, results in an intervention into public space that signifies the presence of an alternative world situated within the real. Recent projects such as *Urban Codemakers* and *noemaflux* explore connections between formal abstraction, street art, pervasive gaming and virtual art, creating mixed realities with hybrid aesthetics, and multiple layers of meaning.

Keywords: mixed realities, code switching, media arts, pervasive gaming, colonisation, Ludea

The codes used in augmented reality (AR) systems may act as signifiers of an alternative reality in themselves, prior to any technological reading. Mixed realities in urban settings are complex media ecologies that are often traversed in a transmedial manner by players and participants. Making AR markers a significant part of the urban landscape, by aestheticising them, results in an intervention into public space that signifies the presence of an alternative world situated within the real.

The term ‘code switching’ comes from linguistics [1]. It describes the process that speakers of multiple languages engage in when they mix those languages together to communicate. By way of example, in Singapore ‘Singlish’ blends various Chinese dialects, Malay, and American and Australian slang words into a hybrid language. Speakers use the most familiar or appropriate word to express what they wish to say, mixing both syntax and grammar in single sentences. Code switching is most common in spoken communication, but for popular forms such as Singlish, written expressions also emerge. Code switching also refers to changes in modes of communication, however this discussion is most concerned with the term’s association with the concept of mixing languages.

In this form of code switching, language elements are often chosen for impact in communication, that is, according to which words are perceived to express the message most effectively. When combined, the hybrid result shifts the



noemaflux
Troy Innocent & Indae Hwang 2011
ISEA2011, Istanbul, Turkey



Urban Codemakers
Troy Innocent 2010
City of Melbourne Laneway Commission



HUMAN READABLE



MACHINE READABLE



SIGNIFIER

ing in augmented reality (AR) markers in previous projects (© Troy Innocent)

meaning again through context. This idea may be applied to mixed realities. They are spaces and experiences, often augmented by digital technologies, that blend different information systems and data in a shared multiuser world embedded in our immediate environment [2]. This paper looks at recent examples from my experimental arts practice (Fig.1) which connect code switching to the multiplicity of audiovisual communication methods used in mixed realities.

It explores this idea by looking at the multiplicity of codes in a street game that was integrated into the city of Sydney during *ISEA2013*, and in the two months prior to the symposium. Urban codes were embedded into streets in Darlinghurst, Newtown and Chatswood, to function as game tokens in a competition over territory between three clans. This reflection on the game is situated within the context generated by a set of relations between dynamic ideography and pervasive iconography.

Pierre Lévy introduced the idea of ‘dynamic ideography’ [3] in the early 90s to articulate the shift from a static to a dynamic medium – that of computation. Central to the concept is the idea of moving beyond the distinction between text and image to generate a more dynamic representation of thought models. The game designer creates a system for interaction that engages the player in the process of communication – playing the role of reader, actor and creator simultaneously. It is a language that uses ani-

mated, interactive images, rather than words, to express mental models more directly.

The game draws upon the pervasive iconography that is possible in mixed realities – environments that blend actual and virtual elements in a continuous narrative or game space. During the digital revolution of the last century, ideographic forms of communication thrived in the audiovisual world of the computer, using movement, icons, colors, gestures and sounds. Inscribed into reality, these languages now have an evolved aesthetic that is shaped by their materiality: glyphs carved into rocks, adapted to woodblock and metal type, drawn as pixels and vectors, and hybridised in mixed realities. In mixed realities iconography can be actuated on many levels, in crossmedia ecologies that interact with the materiality of the world.

A city is made of signs. Contemporary cities are complex urban ecologies generated by relations between signs, a collection of readymade sites for play. Finding ways to decode the networks of people, technology and societies [4], and the politics that shape them, opens up new ways to perceive this hypermediated reality. More recently these have included machine codes (our experience within which is shaped by machine vision, language, and digital iconography), zoning laws, architectural space, street art, and social codes. Games are also made up of codes; in game theory [5] the ‘magic circle’ describes the space inhabited by

the player while following these codes. Mixed realities return the magic circle [6] back to the real world, in a post-digital scenario in which the codes of virtual spaces take on meaning in actual space. This project aims to involve the audience in urban processes via play. The role of the work is to involve players in the process of colonisation, and the ways in which it shapes the past, present and future of a city.

The multiplicity of code in mixed realities

This game has been developed in the context of an experimental arts practice which mobilises the game as a tool for exploring urban ecologies. The game model provides rules of engagement, and a tangible world that frames the experience. *noemaflux* is a related work that employs an augmented reality experience in which multiple roles of the AR markers are explored. Rather than being hidden or embedded in their environment, these markers are made overt through their presentation as aesthetic objects; they are therefore framed with coded colour, incorporated into site specific installations or created with materials such as acrylic and wood. Furthermore, they are made both human-readable (as symbols) and machine-readable (as codes). Their presence on the street as portals into an artificial world reflects their third role, as signifiers of this additional layer to reality.

The Melbourne precursor to the game staged at ISEA in Sydney was *Urban Codemakers*, in which three guilds presented competing plans to redevelop the city applying strategies from game design [7] to urban planning. This game involved the tagging of sites in the city, and revolved around a narrative based on the ‘Hoddle Grid’, and a set of laneways that emerged within the grid. This grid motif, introduced by Robert Russell, was appropriated by Robert Hoddle into the current Melbourne city plan. In these works the multiplicity of code in mixed realities is explored, for example, through the different faces of an AR marker as human-readable, machine-readable, and as a signifier.

The city, games, street art

In the two months leading up to *ISEA2013*, an ambient street game was lurking around the streets of Sydney (or, in the language of this game, *Zydnei*). The game mixes street art, pervasive gaming and dynamic ideography into a mixed reality that explores colonisation

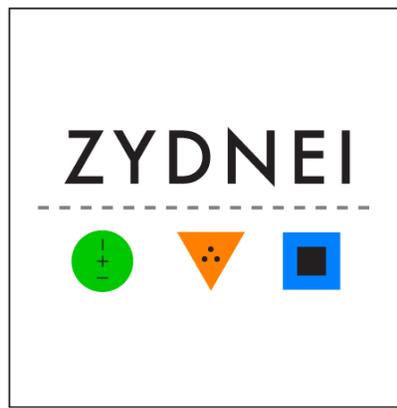


Fig. 2. Zydnei visual identity
(© Troy Innocent) Fig 1. Code switch-

on the streets of Sydney. The linguistic origins of code switching, in terms of mixed societies, for example, parallel these processes of colonisation in cities. This highlights the nature of the city space, shared between humans, machines, systems and infrastructure.

This project is an expression of Australia’s unique history; a dichotomous understanding of our spaces as the product of invasion and renewal. With their city under threat, players are able to ‘take over’ the streets of Sydney and join a clan to revert to the past, renew their present, or completely remake their city – as either New Albion, Sydney, or Zydnei; game mechanics engage players with the city through processes of urban coding that remap and rename these fictional territories.

Cities have played host to experimental art practice for decades. More recently the public space of the city has been augmented via ubiquitous media and mobile screens, creating dynamic, interactive playgrounds that interrogate the relationships among reality, symbols and society. Pervasive games combine theatre, art and play to create participatory interventions in urban public space.

The code switching in *Zydnei* is based on a contemporary re-imagining of the links between human, material and digital interventions into urban spaces. To initiate this process, players begin the game with the following call to action:

“Governor Arthur Phillip arrived in Botany Bay with the First Fleet in 1788 to found a new colony. Finding this site unsuitable, he proceeded to Sydney Cove on Sydney Harbour, where he named the colony ‘New Albion’. For reasons unknown it was later changed to ‘Sydney’. At this time it was home

to the Eora people of the Cadigal clan; over 200 years later it has become one of the world’s ten ‘alpha cities’. Its value has not gone unnoticed to other clans.

In 2013 the people of Sydney are under threat. Another once dormant invasion is now stirring in the city. Traces of a recolonisation have emerged, pointing to a future city named ‘Zydnei’. This is the work of one of the most pervasive forces since the first invasion in 1788. Will you join the invaders? Or will you fight?

The second wave is coming.

Be prepared.

Know your city.”

Thus the narrative begins with a glitch in the history of Sydney – originally named ‘New Albion’ by Governor Arthur Philip, and later renamed ‘Sydney’ for reasons unknown. Transmedia storytelling situates this narrative directly within the city. The central concept is the practice of urban codemaking – a system for decoding and questioning urban space.

Three clans

To reinforce these themes, at the start of the game, players chose a clan; each aligned with a different philosophy on the city – REVERT, RENEW or REMAKE.

CODEX ::: REVERT

Return to the start; revert to the green earth of the pre-technological age. The lost shores of New Albion, the unspoiled promise of Terra Incognita: the verdant haven of Terra Australis.

Begin again at runtime. Hello, world.

OEKOS ::: RENEW

Keep the three sides in balance at the junction of debate; remain in the present, the orange glow of dawn, with full view of the past and future. Sydney is the now. Within its arches and towers are the reflections and foreshadowings of every possible Sydney there has been, and every possibly Sydney to come.

DÆMON ::: REMAKE

The crossroads; the blue sky of the future beyond. The positive charge of permanent change; it is not about where we have been, but where we are going, the synthesis of man and machine, the real and the digital. Parallel evolution leads to a single reality: Zydnei.

These philosophies were each aligned with a conflicting view on the future of the city – to revert to the past, to renew the present, or remake a future city. This embeds players in the primary narrative of the game, and their participation strengthens both their own status in the community, and also that of their clan via a cumulative score. The clan who claims the most territory wins, and re-names the city as New Albion, Sydney, or Zydnei.

How to play

As the game progresses, IdeoTags appear around the city in targeted zones, identified on the game website and in social media feeds. These zones are parts of the city undergoing the process of urban codemaking – sites and locations are marked using the IdeoTags and then photographed. These photographs are posted online, on twitter and instagram as clues for the players.

Ostensibly, you do not need any device or technology to begin playing the game. The IdeoTags that players collect are deliberately simple – they are physical objects removed from the street and kept by the player. At the same time – or later – the code imprinted on the back of the tag can be claimed at the game website.

Each time a player claims a tag they score points for themselves and their clan. A leaderboard showing the top ten players is featured on the game website. The IdeoTags are not all the same – they have different meanings, and are aligned with different clans. Additional mechanics in the game design include: (a) claiming an IdeoTag that matches the clan of the player scores double points; (b) claiming 5 IdeoTags within 24 hours scores bonus points; (c) 4 of a kind scores bonus points; and (c) rare tags that feature a coloured mosaic pattern score quadruple points.

These rare coloured tags revealed story fragments on thematic pages on the game website. The page includes images of the tags to be found, and as each is located its image is replaced with a short

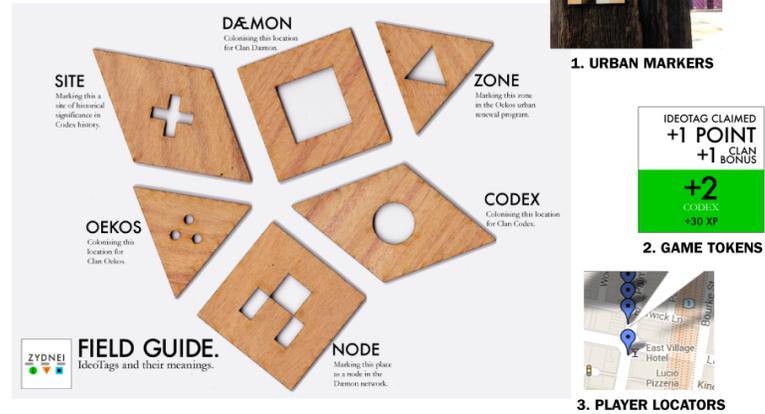


Fig. 3. IdeoTags and their meanings (© Troy Innocent)

piece of text. Each of these pages tell the story of an entity or character from the game world – such as the story of Algernon Sidney [8], a seventeenth century English politician who has been linked to the naming of Sydney.

IdeoTags

In *Zydnei* the IdeoTags (Fig. 3) are like ideograms with locative data; they are not AR markers but collectable objects similar to puzzle pieces, scattered across the city. Volunteers acting as urban planners tagged sites in Darlinghurst, Newtown and Chatswood to mark the territory of the game, turning found locations into readymade game spaces.

The IdeoTags served as urban markers, game tokens and player locators. *Zydnei* explores connections between formal abstraction, street art, pervasive gaming and virtual art, creating mixed realities with hybrid aesthetics and multiple layers of meaning. This is iconographic code switching in action – meaning is generated within the fictional game via interaction between players, urban space and code. These roles are defined as follows:

1. *Urban Marker*: the shape and/or colour of each IdeoTag indicates which clan it belonged to. The symbol within indicates its role, simply marking territory, or tagging a site to revert, renew or remake. Coloured tags have unique patterns that render them visible to machine vision systems, and also distinguish them as unique artifacts to the player.

2. *Game Token*: each IdeoTag is worth a certain number of points in the game. When a player collects a tag from their clan they earn bonus points. Coloured tags unlock story fragments, and are worth four times the number of points of regular tags. Their appearance on the street also signifies the presence of the game; this presence is duplicated via image feeds of tags to social media such as instagram and twitter.
3. *Player Locator*: the claiming of each IdeoTag connects the player to that tag by logging when they collected it. This is cross-referenced with GPS data embedded in the photographic record of the tag to trace the actions and paths of players. More informally, players also post images of their collected tags and activities via both the facebook page connected to the project, and other social media.

This project is part of a larger exploration of a family of digital media languages that have been constructed or evolved in artificial worlds, and adapted for expression in a range of material forms, such as urban art, laser cut signs, installation, stencils and handheld objects. These forms – expressed in paper, aluminium, acrylic and light – translate digital media aesthetics into tangible, spatial, immediate experiences. They are imprinted onto, and into, reality.

experience; their comments will be published in a short video documenting the project.

IdeoTag location data

The game generates a database of photographic, GPS and player data that reveals patterns in the city – this is central to the process of urban codemaking. Each IdeoTag is photographed, its location logged, and the name of the player and when they collected it recorded (Fig. 6). This process generates data that persists after the completion of the game, a collection of traces and flows of IdeoTags and players through the streets of the host city. Individual players may be tracked, and site activity logged via raw GPS coordinates or the collection of photographs, these images providing a survey of the city at the time of the game.

The IdeoTags have a similar role to the marks made by hobos during the depression in the USA last century – a secret code that maps their experiences of urban space. This practice involved a set of specific codes that were carved or marked with chalk to identify opportunities for casual work, friendly versus dishonest people, and so on. Similarly, the city streets already have many other more formal codes embedded within them – locations of electrical services, water, navigational signage. Urban codes from the game overlap with this data, absorbing them into the mixed reality of *Zydney*.

The ongoing process of recolonisation

The emergent narrative of *Zydney* points to the ongoing process of recolonisation that is integral to global cities. It is a playful exploration of these themes, both literally as a game, and metaphorically as an alternative reality that changes the language of the city, with *Sydney* comprising of three main territories: Zalin-hast, Renewtown and Zhatswud, that reinvent existing suburbs of the city. This experience is created on several levels via the analog, lo-tech IdeoTag system that engages with the mixed reality of the game space.

The catalyst for the player experience in the mixed reality of *Zydney* was the code switching embedded within the IdeoTags. As outlined earlier, these codes functioned on multiple levels in the mixed reality, switching as required dependent on their relationship to the city, the game or the player.

Their role in linking the layers of the

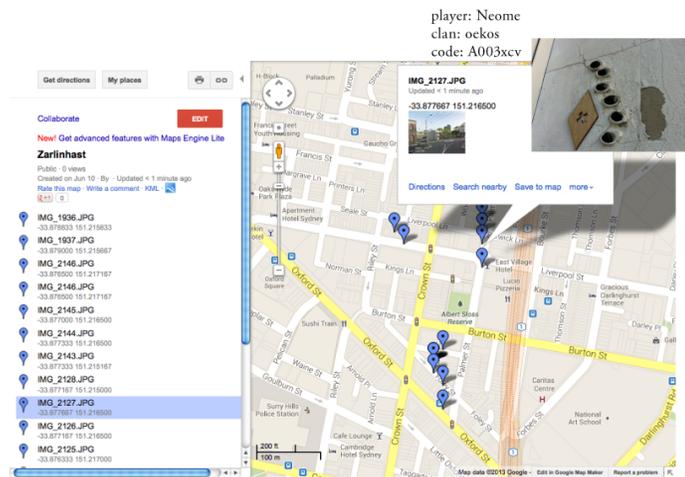


Fig. 6. Logging of IdeoTag data (© Troy Innocent)

mixed reality is analogous to the process of code switching – different aspects of their nature are foregrounded dependent on their context. This type of ideographic code switching plays an integral role in the function of the IdeoTags as portals in the mixed reality, allowing for traversal of different paths: portals into the fictional game world from the actual world of the city, and into the ludic dimension of the game via their collectability as objects. Via their locative function, they both transform existing locations into sites of play, and also connect these sites to the players.

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