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Declaration

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; and, any editorial work, paid or unpaid, carried out by a third party is acknowledged.

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(name here) Hong He

(date here) 1, 11, 2006
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2. Federation Square

3. Randazzo Park

4. Curtain Square (Project site)

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A2. Street hierarchy
A3. Exterior skin

B. Internal Condition
B1. Plants form
B2. Site skin
B3. Facility
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The initial concept of my project started from my experience in China. The domestic increase of productivity, heavier workloads and longer working hours have provoked an urgent desire for an increased quality of leisure, which has triggered an enormous basic demand for comfortable houses with gardens in Chinese societies. But most Chinese people do not have a backyard or a garden to themselves due to the high population density. Public open space has to compensate for this demand. Meanwhile, with the quickening tempo of modern life and prolonged working hours, most people have to enjoy their entertainment and social activities after daytime. Therefore, these public open spaces are even more highly used than during the day, people use them as their backyard and for social gatherings. How these open spaces operate at night has had an enormous impact on nightlife and its importance has been gradually recognized. The Chinese government is spending large amounts of money constructing and upgrading the lighting in open space. But most of these projects do not address key issues associated with lighting. For example, what the government considers ‘good lighting’ many people consider to be over-lighting or functional lighting and even some lighting projects leave many functions of the space unlit. For instance, pathways or sidewalks are not lit but the plazas and squares are. Those types of issues occur in many open spaces due to a traditional approach to the lighting design process which tends to occur separately to the design process. Obviously most lighting projects do not really consider the relation of light, space and people’s use. When I came to Melbourne I found out that the City of Melbourne has a specific lighting strategy, which is more about electricity saving and technical requirements rather than spatiality. In addition, many lighting companies deal with lighting effect on surrounding landscape and architecture but are not about spatiality.

So in order to understand the spatial qualities of lighting, my original research questions were: 1. Instead of traditional building materials how lighting can be used to transform space and spatial quality in open space? 2. How does lighting spatially bridge between site and street, site and building, site and context, eventually site and city? 3. I also wanted to consider the site’s identity at various scales.

Introduction

I wish to especially thank my two supervisors Rosalea Monacalla and Sue Anne Ware who were so supportive in the process of my research. I also thank my friends Guo Wei, Zhao Baoming they both took photos for me and email materials I need from China. Final thanks go to my dear parents who teach me how to think and gave me well-timed encouragement in the past two years.

Acknowledgments:

‘Light is a building material.’ (Mende, 2000, p.11) ‘Light is integral to architecture; it reveals function and form; it defines the image, color and texture of buildings, cities and landscapes.’ (Thimmrauzer et al. 2000, p.1)

‘Nightscape’ is a term I use to describe my approach in this project which deals with lighting at night spatially, rather than just considering lighting and space as separate entities.
Nightscape is a process that uses lighting as its main medium to formulate various spatial outcomes and offer diverse experiences at night. Light includes both natural light and artificial lighting. Natural light is not easily controlled by human beings, so what really interests me is what artificial lighting can do for landscape design and people’s nightlife. Lighting can reveal form and texture as well as change the visual boundary and scale. ‘Dynamic’ refers to lighting which provides more possibilities of space and spatial quality in terms of people’s experience at night. This suggests a landscape or a set of landscape systems which can be differentiated by lighting operations at night. The site specific ‘exterior conditions’ and ‘interior conditions’ engage landscape lighting that reorganizes nightscape in terms of ‘edge’, ‘axis’ and ‘spatial quality’. Preceding practitioners and references involve explorations into light and space, which inspires me to set up the design elements in this research, in a similar manner James Turrell and Steven Holl.

The ‘edge’ redefines the boundary in terms of lighting at night, a highly influential design element in the park at night, which directly affects the spatial experience and identity of the site at night. ‘Axis’ is conceived as a narrative framework for nightscape on the site. It is created and connected by focal points of lighting, which redefine the visual order as well as potentially create particular spaces to accommodate different activities. ‘Spatial quality’ refers to qualitative spaces redefined by inseparable elements of site conditions, edge, axis, and variation of events. The distinctiveness of edge, axis and spatial quality directly or indirectly determines the unique night effect for each site, night effect is the outcome of the combination between spatial intent, spatial effect and spatial event. I have used new tools and methods for conceiving these spatial outcomes of my research (light meter, diagrams, layers, models, sketches, etc.)

This DVR has been organized into seven sections; the first section considers four case studies both in Melbourne and Shanghai. I then selected Curtain Square as my project site to explore specific site conditions due to it currently follows conventional lighting strategy and emphasize the functional use of site. I desire to apply my idea into this conventional park in Melbourne. The next sections entitled: ‘edge’, ‘axis’ and ‘spatial quality’ focus on how these design elements define, organize, or shift spatial outcomes at night. The next section of the DVR, formulates ten event scenarios as conceptual designs for Curtain Square based on the three design elements. Ten scenarios have utilized the existing lights due to the research being on the spatial concerns of lighting rather than expansion of lighting fixtures. Contemporary lighting technologies offer us a variety of fixtures to enhance spatial quality, Such as LED, Optic fibers, etc. But I positioned my research to look at the design tools as a foundation to the new alternative lighting sources. These design elements reflect the experience and occupation. If we can manipulate them, the quality of the nightscape will be optimized as well as conceptualized. On the contrary, the lack of control of these design elements will not be effective spatially! The final section offers conclusions about what I have learnt in my masters by research.

1. Instead of traditional building materials what can lighting do for landscape? How can lighting be used to transform space and spatial quality? Spatial quality means more specific spatial experience.

2. In daylight, streets and residences benefit greatly from the adjacent park. However, when night falls, the foliage and the attractive views maybe replaced with a void. Is it possible use lighting to bridge site and street, site and building to replace the void with attractive views? How does lighting bridge between site and street, site and building, site and context, and ultimately site and city spatiality?

3. How can lighting design inform a site’s transforming nightscape at various scales?
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Satellite image of the artificial night sky's brightness and its stellar visibility

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In order to analyses the external and internal components of open spaces in terms of lighting, a couple of case studies were selected from the city and suburb of Melbourne and Shanghai, China. These sites include two public squares: Federation Square and People's Square, and two residential parks: Curtain Square and Randazzo Park. The selection of two types of parks considers the different context of each site in terms of lighting at night. The quality of each type of park became easily identifiable by comparison. I eventually utilized Curtain Square as my design site. The locations of these sites have been described below.

Initial Case Studies

Studies were selected from the city and suburbs of Melbourne and Shanghai, China. These sites include two public squares: Federation Square and People's Square, and two residential parks: Curtain Square and Randazzo Park. The selection of two types of parks considers the different context of each site in terms of lighting at night. The quality of each type of park became easily identifiable by comparison. I eventually utilized Curtain Square as my design site. The locations of these sites have been described below.

Effect of Space

Since artificial lighting was invented, it has been an essential part of nightlife. Light is integral to architecture, as it reveals beauty and function and form. Tischhauser et al. 2005, p.11) New technology provides us with thousands of fittings to create an alluring effect at night. But night lighting should not be regarded as selecting fittings or pure lighting design. Pure lighting design normally considers lighting and site as two separate things, it does not necessarily design lighting spatially. Currently, most night lighting projects in city landscapes are aimed at lighting effects or technical requirements rather than spatiality. Some night lighting companies (Light on Landscape) aim at using lighting to bring outside space alive and attractive. But what really interests me is how lighting can be used to create space.

Functional & Monotonous

The Melbourne lighting strategy states: Traditional lighting on open space emphasizes providing enough illumination to the most popular walking routes. To ensure that these pathways are well connected with surrounding city streets. Do not light the routes that are seldom used. Furthermore introduce timers or energy-efficient dimmable lamps along infrequently used pathways. They use these controls to reduce illumination during the early hours of the morning. In most of the cases, the monotonous lighting restricts the events and space to walking. The current Melbourne lighting strategy is concerned with safety, function, and energy-efficiency rather than spatial experience at night. This attitude is mirrored in China, perhaps to an even greater degree. For instance, functional lighting occurs frequently. Through a series of case study observations, the physical configuration and spatial experience of each unique nighttime set a departure point of my initial analysis.

Analysis of Spatial Depth

Light is the most important tool to reveal form, color and boundaries in an open space after dark. Different areas of action during the day are described by specific programs. But at night, space is rendered by lighting. Spatial uses and appropriation could not be displayed on my plans or photos specifically. The complex spatial volumes are not described on these photos as well. So I needed a better way to show the complex spatial transformation.

Sketches

In comparison with photos, sketches were used here as an effective way to record the depth of space lit by lighting and the characteristics of light. I drew a series of them for the four sites in order to understand the experience and spatial transformation of these sites at night. These sketches accurately represent the configuration and depth of subspaces, in which I was interested to observe the spatial transformation from the interaction of context and interior night lighting. But the technique of sketching was not able to indicate influences from the complex context and internal components completely and specifically. I wanted to find a better way to show the complexity of these interactions. I also considered how these interactions affect the spatial transformation.

Dynamic lighting provides more possibilities of space and spatial quality in terms of people's experience at night. A photograph can change people's appearance by using different quality of lighting (ie. indensity, direction, color, etc.) using different quality of lighting. Simply put, tone and value are measures of light and dark in a drawing. (Sullivan, 1997, p116)

Depth

If line give structure and context to a drawing, then it is light, shade and shadow that make a drawing come alive. Tone and value are measures of light and dark in a drawing. ‘If lines give structure and context to a drawing, then it is light, shade and shadow that make a drawing come alive. Tone and value are measures of light and dark in a drawing.’ (Sullivan, 1997, p116)
Case Study 1

People’s Square and Night View

People’s Square is located in Puxi, Shanghai, China. It is a well-known city square and is also the biggest public square in Shanghai. It is a political and cultural centre due to its location in the busiest district and is surrounded by the Shanghai Grand Opera Palace, Shanghai Municipal Government, Shanghai Museum, and Shanghai Layout Institution. Current lighting strongly emphasises the Shanghai Museum as a main focus in comparison with dim down lighting on the rest of the site. The boundary of the east and west sides is lit by dim uplights to indicate the separation between the site and the busy street.

Sketches on People’s Square

These sketches recorded the strong comparison between Shanghai Museum and the entire site, by which reveals the big isolated square with surrounding environment. The focal point of the site is Shanghai Museum, which was proposed to be used as navigating tower or a sort of landmark for people’s square in terms of lighting at night. The disconnection and separation have been generated between this ‘landmark’ and CBD context by placing dim lights on the entire site. It becomes a dark disappeared void rather than be used as inviting and spreading public open space at night. However, site boundary clearly drawn by uplights that restrict the events to walking and moving. Site and surrounding have become two separated space due to lighting placement.

Voice of Some Visitors

We have been to people’s square many times. It is a very dark site at night, even it located in Shanghai CBD, and all surrounding roads are arterial and major roads. The internal lighting of this park also very dim and obscure, it is very easy to get lost in the site. Take north-east entrance for example, this is very busy entrance at daytime due to next to very busy road. Most people use it for walk or other relevant activities. However, at night time, this entrance is usually closed and it is very dark inside the site, so it is not suitable for walk or any other behaviors even come with my boyfriends. Here is not suitable for move at night.
Federation Square and Night View

Federation Square, acts as a vibrant focus for visitors and locals alike, positioned in the centre of Melbourne. Federation Square not only brings together a creative mix of attractions, including the Ian Potter Centre: NGV Australia, ACMI: The Australian Centre for the moving Image, Champions: Australian Racing Museum & Hall of Fame and the Melbourne Visitor Centre. Federation Square also boasts a range of restaurants, cafes, bars, two dedicated function centres, and public spaces [http://www.federationsquare.com.au/] [Accessed 6 June 2005]

The lighting design has contributed to Federation Square as a night-time destination. In addition, the stage space at the center of square is formed by concert screen lighting and projected lights from the top of the surrounding buildings.

City Identity Reappearance

'Federation Square, acts as a vibrant focus for visitors and locals alike, positioned in the centre of Melbourne. Federation Square not only brings together a creative mix of attractions, including the Ian Potter Centre: NGV Australia, ACMI: The Australian Centre for the moving Image, Champions: Australian Racing Museum & Hall of Fame and the Melbourne Visitor Centre. Federation Square also boasts a range of restaurants, cafes, bars, two dedicated function centres, and public spaces.'

Melbourne's tram identity

Melbourne's tram system began operations in 1885. The cable tram system grew to be very comprehensive and operated successfully for 55 years.
Sketches of Federation Square

Several entries into Federation Square on the north side are featured with step lighting, which connects the site and the street naturally and vividly. The luminaries seem random and they appear to bounce the light between the fractal forms.

Spiritual Connection

Spiritual connection

Melbourne today is a welcoming, outgoing and confident city, a reflection on the generous and inclusive spirit of its people.

Cultural Connection

Melbourne is one of the world’s most harmonious and culturally diverse communities. Federation Square design and its lighting engage the diverse elements of Melbourne’s multicultural context.

Cultural context

Some benches with lights underneath not only demonstrate the figure of the seating area but also become a part of the egresses. They not only make the benches a place where visitors can sit and feel a part of this big square but they also make the north-west frontage inviting, sparkling and spreading. This occurs throughout this project and responds to the intention of this as a major public space. This sort of lighting reinforces the intention of site that is interweaving and spatial.
Case Study 3  
Randazzo Park and Night View

Randazzo Park has been designed to create an open space retreat in a highly urbanised residential area (Brunswick, Melbourne). Its north side faces Albert St and the other three sides are surrounded by residential areas. Randazzo Park has used innovative lighting with concrete spheres that spell out the name of park and light up, and extensive timber benches with lighting underneath (35w) that add a theatrical effect to the space. There are also two existing downlights (100w) that light the ground surface. These photos indicate the current lighting on site, but they do not catch the depth and quality of space. I wanted to explore a diagram and make the space readable.

Sketches of Randazzo Park

The below sketches are used as a kind of diagram to read the night scenario of the site. They display the connection between existing lighting by eliminating the tone and detail from the real scenario. A string of oblique spheres illuminated from in laced on the side of the curb. This is an innovative lighting strategy on this site. The balls are well connected to the street and the site. The removal of street lights means that people can easily see the park’s name and move into site with the balls guiding them. Both of the downlights are placed on the sandy pathway to make very strong connections in comparison with entire site and the street. One connects the west entry and southern residences, another connects the pathway and the long timber deck to form a clear shortcut from the east entry to the southern residences. Extensive lighting underneath the long timber deck also has the potential to enlarge the space at night.

"Space is a marketing tool. A variety of spaces within a store, Prada can be big in small spaces. Nike can only be big in large spaces." Rem Koolhaas stated the spatial concept of Prada Stores in New York. What is the concept of nightscape? (Koolhaas, Prada, 2001)
3054 (Curtain Square)
North Carlton, Melbourne, Australia
Curtain Square is a typical residential park situated on Rathdowne Street in Carlton North. It is divided into four rectangles by intersecting footpaths. Two of these parts provide some basic exercise facilities and the others have lawn for a range of activities. Existing lighting on this site includes two types of lamps: skirting on both sides of the footpath. One is a conventional lamp pole with a downlight fitting which illuminates the ground surface below, (100w metal halide pole lighting) and the other is standard uplights (70w metal halide in-ground lighting) for illuminating the upper surfaces. The boundaries or sidewalks are lit by street downlights. (250w high pressure sodium pole lighting) These photos indicate the current lighting on site, but they could not capture the depth and quality of the space. I wanted to show these things on diagrams and make them more readable?

Reason for Selection
Curtain Square is a conventional park situated in North Carlton. Its design can be found almost anywhere in Melbourne. The current lighting plan of Curtain Square belongs to conventional lighting strategies of the City of Yarra, which emphasises the functional use of the site for the neighboring residences. I have compared its lighting design with Randazzo Park and Federation Square, and then reconsidered my ideas on lighting design. At the same time, it is quite near to my house, and I can observe the park often.

Sketches on Curtain Square
The sketches reflected the separate and isolated spaces creating by downlights on site without any connection between. In contrast to street lighting especially on the west side, entire site is isolated from street and contest due to static and disconnected lighting placement, which was placed downlights with certain distance by the side of pathway trying to guide user. In addition, People could not borrow any view from this park at night when walk around it.
The objective of this chapter is to deduce how specific site conditions enable the spatial transformations and connections within the nightscape.

Conditions

- population density
- street hierarchies
- site periphery
- vegetation form
- site skin- considers the site surface
- facilities-benches, fences, rubbish bins, etc.
- topography

Research Diagram: The flow diagram shows the physical structure of nightscape, and gives a brief explanation of the concepts of this project.

Research Question: How can lighting be used to transform space and spatial quality within landscape?
Conditions
Conditions in my research can be regarded as the forces from the exterior or interior of the site. They interact to change the characteristics and functions of the site and its nightscape in terms of lighting. The distinctiveness of the conditions directly or indirectly determines the unique nightscape. Conditions are comprised of external conditions and the internal conditions. I am interested in how conditions relate to the configuration of site at night. All architecture has context. Each design has a physical, a theoretical, an emotional and a cultural context. (Downtown, 2003, p.1) What is the physical context in terms of lighting for my site?

A. Exterior Conditions

The exterior conditions incorporate three aspects from the physical network [1] of the site and its architectural references. They initially focused on ‘paths’ in this network. These paths are:

A1. Population density
A2. Street hierarchy
A3. Site periphery

These external conditions define the external spatial organization of the site.

A1. Population density
Population density can bring more possibilities to space. Higher population density demands more public space for social life, therefore site lighting in a dense area would be completely different from low populated areas. From this population density mapping of Melbourne’s CBD and its inner city suburbs, and the photos, you will notice that the public space in it with magnificent or sophisticated lighting. (Such as the catenary table on Federation Square) These occur mainly in areas with high population density or as focal points. Federation Square for example, contains commercial spaces, restaurants, and recreational areas which operate collectively as attraction points. These activities or events resulted in high lighting levels or sophisticated lighting features that entice the site and affects its context.

[1] There is no work of architecture without context. Each work has a physical, a theoretical, an emotional and a cultural context. (Downtown, 2003, p.1)

A2. Street Hierarchy

Street hierarchies are essential to the configuration of site. (Melbourne Lighting Strategy, 2002) “Soft” structures such as pedestrian pathways and different intensities of street activity. (Melbourne Lighting Strategy, 2002)

"Soft" structures such as pedestrian pathways and different intensities of street activity. (Melbourne Lighting Strategy, 2002)

A3. Site periphery

Arterial roads can have a more visible spatial influence than other types of streets. The street hierarchies and the next part, the Exterior Skin, particularly alter the space and spatial quality of site through its edge in terms of lighting. This will be defined further in next chapter.

Linkage
What is the linkage between street and site in terms of lighting? What will happen on site if the degree of street lighting is altered? How can the degree of this linkage be measured? As Lynn states, without changing the position of any one of the control vertices or the degree of spline, the figure will be altered when the weight or direction of any of normals is altered. (1999, p.23)

The below diagrams and photos show the relationships between street hierarchies and the lighting layout. This is marked by different levels of activities and uses occurring on the exterior of the site; this implies an exterior spatial transformation from different types of roads in terms of lighting. Separation between the site and the street can be refined by street lighting at night. For instance, part of the site or its boundary can be used as a sidewalk or for seating. The unclear separation of site and street could be blurred by diffusing the lighting. In addition, arterial roads and major roads have busier traffic conditions such as buses, cars and people compared to a local road. This means that arterial roads can have a more visible spatial influence than other types of streets. The street hierarchies and the next part, the Exterior Skin, particularly alter the space and spatial quality of site through its edge in terms of lighting. This will be defined further.

Diagram: Relationship Between Lighting Layout and Street Types
[Data sources: Melbourne Lighting Strategy, 2002 and City of Yarra Road Management Plan, 2006]
A2. Street Hierarchies

Comparison

This exercise, a series of mappings, was to indicate the degree of the influence that comes from the external street hierarchy at Curtain Square. By mapping the surrounding street hierarchies I was trying to identify what kind of street exerts the most influence from external conditions and brings more activities to Curtain Square. There are two types of streets that closely surround Curtain Square; only one ‘major’ street (Rathdowne Street) and three ‘local’ streets (Curtain Street, Canning Street and Newry Street). There are no ‘arterial’ streets. The different colored lines represent the different hierarchies of the street lighting. This mapping did not represent the specific lighting quality of these streets but provided an understanding of the external street lighting context for the site. Therefore ‘local’ streets are more influential than other streets to Curtain Square in terms of lighting.

A2. Street Hierarchies

Comparison Between Two Sites

These street hierarchy mappings compare two sites and their influences. Federation Square has a completely different external condition to Curtain Square. Two ‘arterial’ streets intersect at one corner of Federation Square, Swanston Street and Flinders Street. And the other streets which connect to Federation Square are ‘major’ streets. In comparison with Curtain Square, Federation Square’s whole street lighting is significantly higher than Curtain Square’s. Arterial streets carry high lighting levels due to more circulation and traffic loads. This allows many people to congregate and move from the street to Federation Square even at night. Cafés and outdoor concerts not only use events to attract visitors but also use lighting. The adjacent part of Swanston Street is the main entry and connection point to Federation Square especially at night. The boundary between the streets and the site is blurred or disappears.

These are design diagrams, but their purposes are analytic. They are superimposed and multilayered with a range of influence and determinations and suggest the complex forces shaping the habitat. (Austin, Byproduct of Tokyo 2001, p11)
A3. Site Periphery
The site periphery is defined as different categories of use of the external buildings adjacent to the site. Without the analytical framework, I was uncertain of the park’s external neighborhood in terms of lighting. I wanted to know what establishes the bridges with external components of the site’s lighting. The site periphery analysis is based on the precise physical location mapping of Curtain Square and its surrounding buildings. Different types of buildings influence different functions for the Square and also indicate the uneven lighting levels and quality. This has a close relationship with the site. For instance, couples may not like to sit in the site where it is illuminated by strong lighting from an adjacent building. Instead, they may like to sit near the housing area with its soft lighting effect. From this context, Curtain Square’s nightshade is influenced mostly by the nearby residential lighting. The commercial lighting and the school’s lighting exert less force on the experience of the nightshade. I speculated that the lighting level on the east side and halfway between the north and south side is lower than the west part of Curtain Square. I wish to manipulate or move these site periphery and generate a new park design for night.

Mapping Analysis
This mapping is used for reflecting the intensity with which the external neighborhood buildings relate to the site. The lines have different densities and represent the relationship between different types of buildings with the site in terms of lighting. The highest density of lines indicates the maximum possibilities and involvement with activities in relation to lighting at night. This technique catches the level of the relationship but it cannot indicate a way the site can be transformed and influenced.

A4. Site Periphery Comparison between Two Sites’ surrounding
This mapping is of the external buildings and enables an easy comparison between Curtain Square and the CBD in terms of lighting. It is important because the maps show various external levels of lighting and their adjacency to my site and the CBD. The CBD has a much greater amount of high intensity, commercial lighting and Curtain Square has a greater amount of low intensity, residential lighting. This implies that at night more people may inhabit the higher intensity areas. While this is interesting, I do not think that high intensity commercial lighting is appropriate for the exterior context of Curtain Square. How can I manipulate the existing soft levels of exterior lighting to change the internal spaces and edges of Curtain Square without being like the CBD?

Interwoven
A system with no inside or outside, no center and no periphery, but with merely one virtual circulating substance-force-and its variety of actualized modes-linear, rotating, ascending, combining, transecting. (Kwinter, 2001, p96)

Illusions
The illusions found in these Southern California works of solid forms dissolving through reflected or projected light, all result from an interaction between the ambient light and objects themselves. (Butterfield, 1996, p8)
B. Internal Conditions

The internal conditions indicate the existing objects and surfaces on my site which exert influence on current lighting effects and consequently reorganize the internal space of my site. They are classified as:


I have used bar diagrams (below) to describe the interactions and transformations of space. This diagram is based on my experience of the site at night. The different colors in the bars represent the existing conditions. They suggest the specific location of existing materials, surfaces and plants. The relationship between lighting and them. There are tall sparsely-leaved trees and more lamps on the east side of Curtain Square, it is a connected space with the external road, Rathdowne Street. On the west side, two lamps form two separate spaces; one is on the pathway with evergreen trees and it is an isolated space. The other space is difficult to access as there is no walking route to it. On the far end of the east side, one internal lamp and one street lamp connect these spaces because they are close together. The diagram represents the current internal space organization of the site, what will happen on site if I manipulate its interior conditions? How will this affect the spatial experience of Curtain Square at night?

An analysis of space transformation generated four spatial typologies on the site by altering interior conditions in terms of lighting at night.
Space Transformations

This exercise was intended to show spatial sensitivity based on the interactive relationship between interior conditions and lighting at night. Each section creates a unique night time park by eliminating some conditions of the park. The spatial modifications resulted from the physical subtraction of elements. The partial addition or subtraction of conditions generates new spatial experiences. In other words, they generate a new park at night.

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If I only modify lighting in the park I can also generate various possibilities. What happens to people’s movement even from natural light to artificial lighting? This bar diagram is an abstraction to understand the transformation in terms of lighting. It could not include other specific spatial experiences due to the unique characteristics of lighting, such as visual connection and diffusion. What is visual connection and diffusion? How can they affect the park at night?

Movement from day to night

This diagram recorded people’s movement from day to night and was an approach to prove lighting and space is not separable. From day to night, people’s movement range was changed significantly by changing lighting even from natural light to artificial lighting. I stayed on my site from day to night to record people’s movement hourly on the 18th May 2005. The busiest part of the section is three playgrounds and grassed area. During the daytime, it attracted the most people from the time 10:30am to 2:30pm, especially on the area with playing facilities. But at night, people seldom use the facilities and the east part of this site due to not enough lighting. What happens to the park if I only manipulate its artificial lighting at night? How will it affect the spatial experience of the site?
Occupation and Circulation
The two diagrams below exhibit specific people’s occupation and the demographics on site from day to night. I wanted to find out who used Curtian Square and where they used it the most. This is supplementary evidence for my previous movement diagrams. There are middle aged women and their kids using the park. This diagram should also be read at the time as my circulation diagram. According to my observations, most people come to my site for walking and using the four playgrounds, especially the three playgrounds near the southern edge. Even at night, I have seen kids drag their parents to this playground many times. But most parents do not allow kids to play alone and walk in this dark park. Therefore, nearly no people are able to use the playground after dark due to its current poor lighting conditions. The west side of the park is still used by people because of the influence of the exterior lighting from Rathdowne Street.

Edge
The edge is a defined space in terms of lighting at night. This chapter questions the relationship between the edge conditions and the user.
The ‘edge’ is a redefined boundary in terms of lighting at night. It is a highly influential design element in the park, which directly affects the spatial experience and identity of the site at night. My previous diagrams did not reflect the specific lighting conditions in detail. I developed these circle diagrams to display the edge condition. ‘Edge’ is one of the design elements that creates a certain space. For example, a curb separates the walking area (footpath) and the leisure area (park) on the west side of the park. When applying lighting along the boundary of the park this allows people to neglect the separation of curb. They use part of this park as a sidewalk at night due to its permeability and the guiding characteristics of the lights.

The analysis was compiled after visiting the site with a light meter and measuring equipment. Each lamp was measured for its lighting level by using the light meter. The lighting level was measured every meter from the center of each lamp both horizontally and vertically. The Lux level was then recorded to create this diagrammatic plan. It was not completely accurate but it clearly reflects the results of the external and internal conditions. Lighting diffuses and the circle decreases gradually. (Lux, the International System unit of illumination, is equal to one lumen per square meter.) Circle diagram represents the lighting level that measured by lighting meter.

**Technique**

This edge diagram is an overlay of the external and internal edge diagram. The west edge of the street is enlarged by the high level of street lighting, which represents a strong connection between the street and the park. More so than the other three streets.
The edge becomes ambiguous between exterior and interior because of the strong street lighting entering the park. This edge is blurred, there is a slight difference from the street to the park. (average of 20 lux)

People use this area at night.

The lux level (25 lux) is the highest in the park. Therefore the most people use this part of the park at night. People tend to stay or sit here temporarily.

The lux level is lower than 4-5 lux. I never see any people use this space at night.

There is a single lamp here. There is no connection with the other exterior or interior lighting. People seldom go through this space at night.

The reading here was lower than 5 lux. The exercise facilities are not well lit. The space is redefined by lighting rather than the exercise facilities. People seldom use it at night.

The existing edge condition diagram is an overlay of the external and internal edge conditions. It displays how the lighting conditions interwoven with the parks physical edge conditions.

Axis (轴线)
Axis is a narrative framework for the physical scenarios at night. The axis is created and connected by illuminated areas, which have the potential to create a space which can accommodate different activities.
New lighting fixtures offer multiple ways to form various spaces. The axis is connection between the visual focal points especially at night. ‘Axis’ is a narrative framework for nightscape on the site. It is created and connected by illuminated areas, which redefine the visual order as well as potentially create particular spaces to accommodate different activities. For instance, down-lighting irradiates the surface of the ground. The surface indicates the range of potential activities that could happen in this space, such as staying or walking through this space. Up-lighting irradiates an object upward which enables this object to become a navigation point for activity. People do not really walk through there currently. By connecting all these particular points to form an axis, the framework of a proposed space can be better illustrated.

This drawing indicates the focal points of two types of existing lamps and exterior lighting on the site. The undulating axis of the site implies a visual connection that is part of a spatial experience which is not included in the previous diagrams.

Spatial Quality
Spatial quality includes edge and axis. This chapter is about a more specific description of spatial experience. I want to emphasize the unique characteristics of the diffusion of lighting.
Spatial quality

The chapter begins by examining several installation works and architectural examples of light and space. These designs have in common they use light to define space. They both use lighting as a bridge to connect visitors and space. James Turrell, an American artist, involves explorations in light and space that speak to viewers without words, impacting the eye, body, and mind with the force of a spiritual awakening. Turrell’s work uses light as a medium to render and define space. “Atlan,” the transforma-
tion process of edge, axis and quality was illustrated by tone and shadow. They give the depth and atmospheres of space.

Atlan

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Spatial quality

“People do not see light. They see the effects of light”. (Jonathan, Major, Tischhauser, 2004) People may not remember the lighting fixture, but they can remember the feeling and quality of the night space they experience.

Light and Space

“Surprising in its simplicity, “Atlan” is a work that plays on viewers’ sense perceptions. Entering a dimly lit room, one’s eyes adjust for a few moments and viewers often reach through the window in an attempt to touch the opposite wall. This window in the wall is a portal onto another world, providing a view of a limitless space. It is difficult to discern the volume of the second space, and often viewers find what seems to be a deep blue rectangle or monochrome painting on the far wall. As one’s eyes adjust to the darker room, the blue appears to swell in color. Compelling for the way in which the color is evenly and luminously distributed, the viewer is drawn closer to the work for a detailed inspection. Inviting exploration, a surprise is in store for anyone who dares to reach out and touch the work. A spiritual awakening. Turrell’s work uses light as a spiritual awakening. Turrell’s work uses light as a bridge to connect visitors and space. James Turrell, an American artist, involves explorations in light and space that speak to viewers without words, impacting the eye, body, and mind with the force of a spiritual awakening. Turrell’s work uses light as a medium to render and define space. “Atlan,” the transformation process of edge, axis and quality was illustrated by tone and shadow. They give the depth and atmosphere of space.

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Spatial quality

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New lighting sources

Fibre Optic lighting:
This type of lighting is generally expensive since any light guide is made of many fibre optics which are bonded to give a uniform light path from the light source to the object being illuminated. The major advantage of Fibre optic lighting is it is a cold light source. In other words the light will generate no heat on the object it is illuminating. Fibre optic lighting has the advantage of being able to focus intense light over a very short output profile.

LED Lighting:
Price is lower. The light unit requires no expensive or heavy power supply. Most LED units can be pulsed to give a higher intensity. The unit can be offered in various colour LEDs to suit the particular application.

Modern lighting sources

Halogen lighting:
This type of lighting is really only well suited to the simplest of applications. It has poor colour temperature for vision applications and while the cheapest must be considered a very basic form of lighting.

High frequency fluorescent lighting:
The main types of high frequency fluorescent lights offered are ring lights and linear lights. The ring lights are cheaper than the fibre optic alternative, but less flexible and of course generate heat. They are available with different types of bulbs to give different colour temperature lighting. The linear lights have the advantage of giving much diffused lighting and are ideal where even illumination is required over a large area.

High Pressure Sodium:
High Pressure Sodium (HPS) lamps are commonly used for streetlights. They typically have a Correlated Colour Temperature of 1900K, and produce characteristic yellow or orange illumination. On some surfaces, this can produce a "warm" colour. HPS lamps are also energy efficient, and have a long operating life. However, under typical night lighting conditions, the human eye is less sensitive to yellow light than it is to white or blue-white light.

Metal Halide:
Metal halide lamps are an energy efficient source of white and blue-white light. These lamps typically have a Correlated Colour Temperature of 3000-4000K and a Colour Rendering Index of 85. Metal halide lamps are more compact than high pressure sodium (HPS) lamps. For this reason, metal halide lamps perform better optically. They can easily be housed inside light fittings. Therefore the distribution of illumination can be precisely controlled. Metal halide lamps are energy efficient. However, they have a shorter operating life than HPS lamps.

Projects

Based on my previous analysis, I developed 10 scenarios which focus on the quality of open space during night time. I organized them into three types of outcomes; spatial intent, spatial effect and spatial event. I wish to demonstrate innovative designs for nightscapes in Curtain Square by reorganizing the existing lighting. The spatial intent designs concentrate on forming specific qualities which are waiting to be inhabited. In comparison, the spatial effect designs mainly consider the visual effect of the lighting design not the spatial occupation. The spatial event designs attempted to endow the site with new events at various scales during the night.

This chapter situates three approaches to achieve various nightscapes by using two types of existing light. The park’s current lighting without my design work is only functional and not intentionally spatial. In my design work the park is no longer hidden from view but present at night, which encourages its use in a greater variety of ways and expands.
The spatial intent designs concentrate on forming specific qualities of which are waiting to be inhabited.

**Spatial Intent Scenario 1: Corner for Couples**

The intention of this scenario is to create several subspaces filled with the quality of an ‘intimate corner’ to accommodate lovers. According to ‘The Poetics of Space’, a corner that is ‘lived in’ tends to reject and restrain, even to hide. As Bachelard said “a corner is a sort of half-box, part walls, part door.” (Gaston Bachelard, 1994, p.137) Existing features on my site can be used to form ‘corners’ with lighting. Shadows are walls. A tree constitutes a barrier. However, lighting is the key to revealing those qualities through edge and data. For example, if I place a downlamp in front of the plants to cast a shadow behind them, they are infiltrated with a soft lighting effect that covers the seating area. Lovers could sit there and have an intimate corner to hide in but they can also observe other people through the tree branches. So ‘edge’ is the boundary of the shaded area, and the focal point is the ground surface in front of the tree. The sense of intimacy also comes from the distance and separation between those ‘corners’. Keeping a certain distance between each corner is important. Some outside street lamps have been removed to shrink the existing lighting edge to achieve this sort of intimacy. I have also used uplights to make soft connection between corners and entries.

**Plan of Couple Scenario**

![Plan of Couple Scenario](image)
The edge and axis diagrams are used to explain my design aims. The edge is not only used for constructing several ‘corners’, I also shrunk the edge for the entire site by removing some of the existing lighting. I wanted to create more intimacy between each corner. The axis diagram shows the disconnection or separation between corners. In the end, each corner was created by placing downlights in front of the trees.
Spatial Intent  Scenario 2: Bridge as Shortcut

Even in the dark, people have to cross a space which may cause anxiety. Therefore, I wanted to make a convenient network that is a ‘bridge’. I have placed lights along three 'shortcuts' through the site. In addition, I removed all the other lighting to highlight only the shortcuts at night. All other pathways are now invisible and now only the shortcuts guide people across the site.
Although this is a very simple design, it has a very dramatic effect on the site. The edges of the park disappear and the bridges are the only connections to site and its context.

The area is triangular and the focal points are the corners of the triangles. 

**Edge**

Although this is a very simple design, it has a very dramatic effect on the site. The edges of the park disappear and the bridges are the only connections to site and its context.

The area is triangular and the focal points are the corners of the triangles.

**Axis**

The axis is triangular and the focal points are the corners of the triangles.

**N**

This scenario does not attempt to physically imitate the day light, it is supposed to act a way to transfer it also considers the circulation around the edge of the site. As qualities to nighttime. In the daytime people come to this site for strolling, walking their dogs, or traversing it as a shortcut. They desire a walking path that satisfies a passion for bird watching, tree watching etc, in other words, it is a short trip which allows escape from the office or the concrete jungle. This scenario creates a branch form which offers a variety of views and directions to travel. It changes the existing views and focal points within the site.

**Spatial Intent Scenario 3: Branch for Daytime Circulation**

**Interior Condition**

*6% reflectance*

*30% reflectance*

*40% reflectance*

*bushy plants*

*medium bushy plants*

*sparse plants*

*plants site skin*

*0 x 0.9*

*0 x 0.18*

*playing facility*

*fence*

*bench*

*topography*

*facility*
In this design, I have emphasised the Rathdowne Street edge with lighting. There is a strong, clear connection between the street and the branch form. In addition, I have created three focal points along the other streets which stretches the edges of the park outward. When users travel on the edge of the park now, the branches channel their views inward, into the park.

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Spatial Intent  Scenario 4: Present Box for Children

A box is a contained space. A present box is exciting and fun to open. My design idea for this scenario is a present box which is attractive to children and their parents. I can put several boxes together to create a range of spaces. For example, a sports box, a cooperation box, an imagination box, and an observation box combine to form a big neighborhood present box. I am also attempting to meet the needs of modern lifestyle by making the park available at night for parents and children.

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Spatial Intent  Scenario 5: Running Path for Stadium

This scenario uses lighting to create a convenient running path for the community. All the sidewalks around the site are lit as a running path for residents. The surrounding houses become the stadium. This provides a close connection from the path to its context. Also the playing field is lit so that there can be shorter, faster runs as opposed to longer around the block runs. This design facilitates active recreation (running) around and in the site.

This design creates a hard edge around the site and the sports field. It is very directive. The focal points are at each corner providing intense lighting for the running path turns.

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Spatial effect (效果空间)
The spatial effect designs mainly consider the visual effect and impact of the lighting design not the spatial occupation. This did offer unexpected spatial results.

Spatial Effect Scenario 6: Curtain for Winter

In winter many people prefer to stay at home and look through a window at an event rather than participating in it. With this in mind, this scenario attempts to make a sort of pattern that offers a curtain. It can be appreciated or viewed rather than physically experienced. In other words, it acts as a decoration to the site but it does not welcome people to enter the site. In order to create this quality, I have placed uplights along the edges to make an interesting curtain. All of the other interior existing lighting is removed.

Winter Scenario

Circulation

6% reflectance

30% reflectance

40% reflectance

bushy plants

medium bushy plants

sparse plants

plants site skin

0 x

y

100 : 6 = 3 : 1.2

0 x

y

100 : 6 = 3 : 0.9

0 x

y

100 : 6 = 3 : 0.18

playing facility

fence

bench

facility

Topography

interior condition

occupation

circulation

Occupation curtain

Plan of Winter Scenario

Interior condition
The focal point shifts from a point to a vertical curtain. The edges around the site are soft and diffused.

The flat pattern is designed to stimulate the imagination of people when they walk around the outside of the site or view it from their homes.
People desire cool and calm spaces in the summer. I would like to create a summer night scenario where strong shadows and dim lights offer this sort of cool and calm feeling. Fireflies are another symbol of summer. I have tried to imitate fireflies and their movement by using uplights scattered on plants which turn on and off in sequence. I have kept the existing strong context lighting in comparison with the soft inside lighting to demonstrate the cool and quiet feeling of this site.
Spatial event

The spatial event designs attempted to endow the site with new events at various scales during the night, which helps restore the unique identity of site at night.

As a school fete scenario, it is an ardent communication place. It has to be easily accessed and a large spatial volume. The stalls activate the static spaces and enlarge the spatial volume. I am creating stages in this scenario. Each stall is a stage for its surrounding audience. There is also a central stage in the north west corner. The attractive back drop of the Melbourne city skyline is the scenery of this stage.

School Fete
Night Market
Concert
The park now expands out into its edges. It is pinched in at its eastern boundary. Not only does the park expand horizontally but it expands vertically to include the adjacent skyline.

The lighting shadow operating directly with the spatial figure

Lighting diffuse operating & spatial possibilities

6% reflectance

30% reflectance

35% reflectance

40% reflectance

Hard edge

Blurred edge

Mild edge

Soft edge

Lighting type

8000

7700

5240

4500

2000

Down lighting

Up lighting

Plan

Section

School Fete

School Fete Nightscape

Sketch of School Fete

Elevation view from Canning Street

Elevation view from Newry Street

Axonometric view from Canning Street

Axonometric view from Newry Street

Nautical markings

North

South

West

East
I am creating several flowing visual corridors. A market exists for convenience; it should not be a closed space. So the corridor is a sort of approach, inviting users to explore the spaces. The corridor serves as a visual line to guide movement. Several corridors start from Rathdowne Street to the inside of the park, which continues the commercial atmosphere from the street and attracts customers into the site. Each corridor is a shopping space made by two downlamps which helps to create a different experience for selling different products. These flowing visual corridors also make a kind of landscape identity in terms of lighting.

The site now has multiple entry points with strong visual corridors. Pedestrian movement is directed by the corridors and entry points. The axis is also very directed and linear.

Spatial Event Scenario 9: Corridors for Market

Flowing visual corridor

Pedestrian movement is directed by the corridors and entry points.

The axis is also very directed and linear.

Elevation view from Canning Street

Elevation view from Newry Street
Spatial Event Scenario 10: ‘Sound’ as Concert
In designing the scenario I considered how sound could flow through the site. This implies an enlarged scale of an interior space and an extended atmosphere. The lights open up unlimited spaces and bring the site into its context. To reflect these qualities, I removed most of the street lights to extend the space from the inside to the outside. Two downlights are placed on the south-east corner as focal points and they are in contrast with the other dim uplights distributed over the rest of the site. The uplights are radially distributed from the focal point and demonstrate a sort of unified and ordered configuration.

In designing this scenario I considered how ‘sound’ could flow through the site. This implies an enlarged scale of an interior space and an extended atmosphere. The lights open up unlimited spaces and bring the site into its context. To reflect these qualities, I removed most of the street lights to extend the space from the inside to the outside. Two downlights are placed on the south-east corner as focal points and they are in contrast with the other dim uplights distributed over the rest of the site. The uplights are radially distributed from the focal point and demonstrate a sort of unified and ordered configuration.

The edge flows softly across most of the site. Downlights invite entry into the site and the concert. In order to expand this ‘sound’, some street lights have been removed. The axis follows the radiating lines from the ‘stage’ which is the strong focal point. Uplights are radially distributed from the central stage area across the site to carry the ‘sound’ to the entire site and its context.

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Conclusion of my research

After completing the first stage of my masters, and testing my ideas through design explorations lighting has become a dynamic design tool for me. This is embodied within three key discoveries, which begin to answer the key research question for my master. The key research questions are: How can lighting be used to transform space and spatial quality within a night landscape? How can I manipulate axial/edgespatial quality to formulate spatial outcomes at various scales in terms of lighting?

Through the ongoing development of my research, I have found that the key research question encompasses three sub questions. 1. Instead of traditional building materials what can lighting be used to transform space and spatial quality? 2. How can lighting be used to transform space and spatial quality? 3. How does lighting bridge space that operates at multiple scales in the expanded greater context and its immediate surrounds such as the street and surrounding buildings. This design shifts a static and isolated space into a dynamic and interwoven landscape.

Firstly, I have considered lighting as a building material that is a three dimensional medium to define and transform space. It has material qualities similar to concrete or wood. It's material qualities can transform space in terms of its occupation and the physical definitions of spatial volumes and edges at night. For example, the shadow in the corner design creates a strong edge between where occupants inhabit the site and where they are observing the others. The material qualities of lighting in this design focuses on the ground plane, the turf and the trees. Lighting is diffused on the turf and through the trees, which enables the formation of the corner effect. The material quality of Light is my key objective in formulating a spatial effect within a nightscape.

Secondly, designing nightscapes has helped me to understand how lighting can be used as a spatial tool which creates intense spatial experiences. I have primarily explored this through spatial intent, spatial effect, and spatial quality. Material qualities of lighting in this design focused on the ground plane, the turf and the trees. Lighting is diffused on the turf and through the trees, which enables the formation of the corner effect. The material quality of Light is my key objective in formulating a spatial effect within a nightscape.

Thirdly, nightscape allows a shift in the scale of a site within its adjacent context and the greater context of the city. In other words, the designed nightscape should not be confined by the physical boundary of site or park, but is more about specific spaces within the grid and how they might encompass a greater context rather than just the daytime edges. It means nightscape designs have the potential to be viewed, visited or engaged from various scales such as backyards, parks, or cities and permitted to operate within the context of the street and its immediate surrounds such as the surrounding streets and buildings. This design creates a spatially isolated and integrated into a dynamic and interwoven landscape that operates at multiple scales in terms of lighting.

In order to recognize the spatial quality in a more specific manner, I explored lighting through spatial intent, spatial effect, and spatial events, which empha-
sizes the different aspects of my proposed scenarios. Spatial intent concentrates on forming specific qualities which are waiting to be inhabited. For example, corners at various scales in terms of lighting, which orientate the strategies of corners are soft but clearly defined. The spatial effect considers the visual effect and the impact of the lighting design, not its spatial occupation. However, it offers unexpected spatial results. For instance, uplights are rickered to illuminate fireworks in summer nightscapes, this effect offers innovative spatial results. The edge of this scenario is flexible and soft. Spatial events are participative and dynamic. It operates at various scales with new meaning formed, which helps to restore the unique identity of the city. For example, in the Night Market scenario where two main corridors are created by lighting from Rathdowne street serve to invite visitors, make possible an expanded commercial context in the site as well as activate the commercial activities around the site. So the edge in Night Market scenario is linear, short and directive.

What have I learnt in the past two years about the field of landscape architecture in regards to research?

This research has broadened my thinking about the design of landscape. Landscape design for me is not just about parks or gardens purely devoted to aesthetic pleasures. It is a figure forming process of contextual transformations and operations; it covers multiple scales from micro and macro. Recognizing this I have set out to design with processes of transformation, not necessarily static and disconnected forms.

In particular, Nightscape is about reorganizing space through the concept of light and it's dynamic and natural characteristics in terms of edge, spatial quality. My approach to nightscape design embraces multiple conditions rather than a singular one. It can create design solutions which are specific to site conditions, particular occupations, and the sites' greater context at night.

Why is my research useful to nightscape design? How does it expand the field of Landscape Architecture?

My research project work complements or adds to the current Melbourne lighting strategy. It offers a conceptualized spatial organization and transforms traditional lighting design from one which focused on energy efficiency to a strategy with spatial concerns. It proposes lighting as a way to diversify space and also to enlarge our limited living area. This is important especially in China, where it is not surprising to see all the public open spaces highly occupied or used by diverse activities at night. Currently in China most lighting projects focus on creating magnificent effects, which result in spaces being discon-
ected to site conditions, particular occupations, and the sites' greater context at night.

The study of this limitation and questions which have been generated from my master’s research are:

How can the complicated spatial results of my research be formulated with more specific design elements such as reflectance, absorptivity, contrast, etc? My research also has generated new questions about nightscape design, how can this strategy be applied to other landscapes? When the city scale is addressed how can the nightscape strategy incorporate more complicated and diverse conditions.

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This research has broadened my thinking about the design of landscape. Landscape design for me is not just about parks or gardens purely devoted to aesthetic pleasures. It is a figure forming process of contextual transformations and operations; it covers multiple scales from micro and macro. Recognizing this I have set out to design with processes of transformation, not necessarily static and disconnected forms.

In particular, Nightscape is about reorganizing space through the concept of light and it's dynamic and natural characteristics in terms of edge, spatial quality. My approach to nightscape design embraces multiple conditions rather than a singular one. It can create design solutions which are specific to site conditions, particular occupations, and the sites' greater context at night.

Why is my research useful to nightscape design? How does it expand the field of Landscape Architecture?

My research project work complements or adds to the current Melbourne lighting strategy. It offers a conceptualized spatial organization and transforms traditional lighting design from one which focused on energy efficiency to a strategy with spatial concerns. It proposes lighting as a way to diversify space and also to enlarge our limited living area. This is important especially in China, where it is not surprising to see all the public open spaces highly occupied or used by diverse activities at night. Currently in China most lighting projects focus on creating magnificent effects, which result in spaces being discon-
ected to site conditions, particular occupations, and the sites' greater context at night.

The study of this limitation and questions which have been generated from my master’s research are:

How can the complicated spatial results of my research be formulated with more specific design elements such as reflectance, absorptivity, contrast, etc? My research also has generated new questions about nightscape design, how can this strategy be applied to other landscapes? When the city scale is addressed how can the nightscape strategy incorporate more complicated and diverse conditions.

In order to recognize the spatial quality in a more specific manner, I explored lighting through spatial intent, spatial effect, and spatial events, which empha-
sizes the different aspects of my proposed scenarios. Spatial intent concentrates on forming specific qualities which are waiting to be inhabited. For example, corners at various scales in terms of lighting, which orientate the strategies of corners are soft but clearly defined. The spatial effect considers the visual effect and the impact of the lighting design, not its spatial occupation. However, it offers unexpected spatial results. For instance, uplights are rickered to illuminate fireworks in summer nightscapes, this effect offers innovative spatial results. The edge of this scenario is flexible and soft. Spatial events are participative and dynamic. It operates at various scales with new meaning formed, which helps to restore the unique identity of the city. For example, in the Night Market scenario where two main corridors are created by lighting from Rathdowne street serve to invite visitors, make possible an expanded commercial context in the site as well as activate the commercial activities around the site. So the edge in Night Market scenario is linear, short and directive.

What have I learnt in the past two years about the field of landscape architecture in regards to research?

This research has broadened my thinking about the design of landscape. Landscape design for me is not just about parks or gardens purely devoted to aesthetic pleasures. It is a figure forming process of contextual transformations and operations; it covers multiple scales from micro and macro. Recognizing this I have set out to design with processes of transformation, not necessarily static and disconnected forms.

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### Light / Lighting

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