



**UNIVERSITI PUTRA MALAYSIA**

**EFFECTS OF ADVANCED LIGHTING TECHNOLOGY  
ON BUILDING FACADES AT NIGHT, EMOTIONAL STATES  
AND BEHAVIORAL INTENTIONS TOWARDS URBAN SPACES**

**ELYAS VAHEDI MOGHADDAM**

**FRSB 2011 1**



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AND BEHAVIORAL INTENTIONS TOWARDS URBAN SPACES**

**By**

**ELYAS VAHEDI MOGHADDAM**

**Thesis submitted to the School of Graduate Studies, Universiti Putra Malaysia,  
in Fulfilment of the Requirements for the Degree of Master of Science**

**February 2011**



## **DEDICATION**

“It is my honor to dedicate the results of a consequential three year study as a  
Master’s degree dissertation to my parents

**HAMID VAHEDI & ELAHE HASHEMIAN**

Whom without their support and assistance, I wouldn’t be standing here”

**ELYAS VAHEDI MOGHADDAM**

**February 2011**



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment  
of the requirement for the degree of Master of Science

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**February 2011**

**Chair: Mr. Mohd Nasir Baharuddin**

**Faculty: Faculty of Design and Architecture**

The appearance of the physical environment can evoke strong emotions and affects spatial behavior. Static characters of contemporary urban spaces have low night life due to the lack of lighting quality of building facades. This study would like to position how building appearances can become an important factor that contributes towards enhancing urban spaces at night. In this respect, the current study aims to identify the influential traits of new lighting technology and reveal their effect on people emotional states and behavioral intention accordingly. The prominent characteristics of new lighting technology were recognized through investigating the related literature and examining the unique projects, which has used this technology. In next step, by employing a questionnaire-based survey, the Malaysian people's evaluations of these attributes, their effect on emotional states and accordingly behavioral intention towards urban spaces was obtained. The item analysis and exploratory factor analysis of collected data presented visual quality and interactive quality as main influential factors of new lighting technology. Finally, the adapted



M-R model which employed these qualities of new lighting technology as environmental stimuli was verified through Structural Equation Modeling. The decisive outcome supported our hypothesis which proves the importance of applying the new exterior lighting facade in the Malaysian context. The findings provided recommendations on how to increase visual qualities of building appearances, which will positively affect people's preferences towards the built environment. The findings of the current study contribute to develop the theoretical foundation of physical environment's effect on human psychology and behavior. In addition, the study contributes to develop the exterior lighting design criteria for decision making by identifying and categorizing the new attributes of exterior lighting, particularly in Malaysia. Applying these theoretical outcomes in order to develop a conventional system can assist designers, architects, and policy makers in increasing visual qualities of buildings appearances at night, which positively affect Malaysian people's preferences for modern built environment correspondingly.



Abstrak tesis yang dikemukakan kepada SenatUniversiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

KESAN PENCAHAYAAN TEKNOLOGI TERKINI KE ATAS PENAMPILAN BANGUNAN DI WAKTU MALAM, EMOSI DAN TUJUAN TINGKAH LAKU TERHADAP RUANG BANDAR

oleh

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**Februari 2011**

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**Fakulti: Fakulti Rekabentuk dan Senibina**

Penampilan persekitaran fizikal mampu merangsang emosi seterusnya memberi kesan ke atas tingkah laku terhadap sesuatu ruang. Sifat ruang bandar kontemporari yang statik menyumbang kepada kehidupan malam yang lesu disebabkan kualiti pencahayaan yang rendah di muka bangunan. Kajian ini ingin menampilkan bagaimana sesebuah bangunan dapat menjadi faktor penting dalam menyumbang kepada kehebatan ruang bandar pada waktu malam. Di dalam hal ini, kajian ini bertujuan mengenalpasti ciri-ciri yang mempengaruhi teknologi pencahayaan baru dan mendedahkan kesannya ke atas emosi manusia seterusnya terhadap tingkah laku mereka. Kajian literatur dan penelitian ke atas projek-projek unik yang menggunakan teknologi pencahayaan baru dijalankan bagi mengenalpasti ciri-ciri penting teknologi ini. Seterusnya, bagi mengukur penilaian rakyat Malaysia tentang ciri-ciri teknologi baru ini, kesannya ke atas emosi dan tingkah laku terhadap ruang bandar, kajian soal-selidik dijalankan. Analisa butiran dan analisa faktor tinjauan menunjukkan kualiti visual dan interaktif adalah ciri utama teknologi pencahayaan baru. Penggunaan



Structural Equation Modelling melalui adaptasi Model M-R yang menggunakan teknologi pencahayaan baru mengesahkan bahawa aplikasi teknologi ini mampu merangsang persekitaran. Hasil kajian menyokong hipotesis mengenai kepentingan mengaplikasi pencahayaan muka bangunan menggunakan teknologi baru di Malaysia. Hasil kajian juga mencadangkan bagaimana kualiti visual ditingkatkan supaya penampilan sesebuah bangunan dapat memberi kesan positif terhadap persekitarannya. Hasil kajian juga menyumbang kepada pembangunan teori asas persekitaran fizikal ke atas kesan psikologi dan tingkah laku manusia. Disamping itu, kajian menyumbang kepada pembangunan rekabentuk kriteria pencahayaan luaran muka bangunan dengan mengenalpasti dan mengkategorikan ciri-ciri pencahayaan muka bangunan, khususnya di Malaysia. Pengaplikasian teori ini membolehkan sistem konvensional dibangunkan seterusnya membantu pereka, arkitek dan penggubal polisi dalam meningkatkan kualiti visual pada penampilan bangunan di waktu malam, yang sewajarnya dipercayai dapat memberi kesan positif ke atas warga Malaysia terhadap persekitaran alam bina moden.

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for assisting me in all fields to complete my studies at Master’s level”

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I clarify that Examination Committee has met on 28 February 2011 to conduct the final examination of Elyas Vahedi Moghaddam on his Master thesis entitled, “The Effect of Advanced Lighting Technology on Nocturnal Appearances of Buildings Towards Urban People Behavior Intention” in accordance with the Universities and Universities Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U. (A) 106] 15 March 1998. The Committee recommends that the student be awarded the degree of Master of Science.

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Date: 9 June 2011



## **DECLARATION**

I declare that the thesis is my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously, and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or at any other institutions.

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**ELYAS VAHEDI MOGHADDAM**

Date: 28 February 2011



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