A MALAY LANGUAGE-BASED VISUAL PROGRAMMING ENVIRONMENT FOR PERSONAL DIGITAL ASSISTANT

By

SAZLY BIN ANUAR

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirement for the Degree of Master of Science

July 2007
I want to dedicate this thesis to my dearest family, especially my beloved wife, Mrs. Salfarina Abdullah, my dearest son, Mr. Iman Raziq and my lovely daughter, Ms. Iman Nuryasmin for their care, patient and love throughout my studies.
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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Chairman:  Associate Professor Md. Nasir bin Sulaiman, PhD
Faculty:  Computer Science and Information Technology

The research in the field of Visual Programming Language (VPL) is becoming more popular with the increase of computer speed and the graphics capabilities in recent years. A VPL programmer creates a program by connecting a picture or icon that will produce a directed graph, which will show the flow of the program in Visual Programming Environment (VPE). Since the number of today programmers as well as Personal Digital Assistant (PDA) users is rapidly increasing, it seems natural to create a VPE for the PDA. However, most of the programming environments developed for programming directly on PDA are classical textual programming. Another issue in VPE research is lack of concern on graph visualization. Most of the time, the graph layout is disorganized, hence causes difficulties for the user to understand the flow of the graph or program. Moreover, the small screen size of PDA has also becoming one of the main constraint factors. This research proposes the first Malay language-based VPE on PDA. The syntax and the semantics of visual environment are grammatically designed based on the visual programming. Graph
grammar approach is used to describe the syntax for each component. Optimizing the
graph layout is another main concern in this research. The hierarchical layout
technique is used to optimize the graph produced, so that it can suit on limited size of
the PDA screen. It is used because it has proved as the best way in arranging nodes
and edges of a graph that will show the flow of the program. Two experiments were
carried out in this research. First is the testing on MaVi Environment, which is done
to prove that it can be executed on PDA and produces expected output. Second is the
graph layout aesthetics testing, which is done to prove that the optimization of graph
layout makes it more organized compared to the original graph layout. Both testing
yield promising result and thus prove the objectives of the research have been
achieved.
Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

PERSEKITARAN PENGATURCARAAN VISUAL BERASASKAN BAHASA MELAYU UNTUK PEMBANTU PERIBADI DIGITAL

Oleh

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Julai 2007

Pengerusi: Profesor Madya Md. Nasir bin Sulaiman, PhD
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Sintak dan semantik bagi persekitaran visual dari segi tatabahasanya adalah direka berdasarkan pengaturcaraan visual. Pendekatan tatabahasa graf digunakan untuk menerangkan sintak bagi setiap komponen. Mengoptimumkan hamparan graf juga adalah salah satu urusan utama di dalam penyelidikan ini. Teknik hamparan berhirarki digunakan untuk mengoptimumkan graf yang terhasil supaya ia boleh disesuaikan dengan saiz skrin PDA yang amat terhad. Teknik ini dipilih kerana ia telah terbukti sebagai kaedah terbaik dalam menyusun kesemua nod dan tepi sesuatu graf yang akan menunjukkan aliran sesuatu aturcara. Dua eksperimen telah dijalankan di dalam penyelidikan ini. Pertama adalah ujikaji persekitaran MaVi, yang dijalankan untuk membuktikan ia boleh dilaksanakan dan menghasilkan output yang dijangkakan. Kedua, adalah ujikaji ‘aesthetic’ hamparan graf, yang mana ia dijalankan untuk membuktikan bahawa pengoptimuman graf untuk hamparan graf menjadikan ia lebih tersusun berbanding dengan graf yang asal. Kedua-dua ujikaji menghasilkan keputusan yang membanggakan dan seterusnya membuktikan objektif untuk penyelidikan ini tercapai.
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Last but not least, my greatest thanks to all my friends who have helped me in one way or another and wish to extend my sincere appreciation and best wishes.
I certify that an Examination Committee has met on 12 July 2007 to conduct the final examination of Sazly Bin Anuar on his Master of Science thesis entitled “A Malay Language-Based Visual Programming Environment for Personal Digital Assistant” in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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DECLARATION

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

SAZLY BIN ANUAR

Date:
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