



Department of Information Technology

**A Smart CASE Tool Design to Generate an Automatic Graphical User
Interface**

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fulfillment of the requirements for the Master's Degree of Science in
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DEDICATION

I dedicate to whom I carry his name, my dear father.

- To the path of guidance, patience and hope, my ideal mother.

-To my dear brothers and sisters

-To my faithful friends in Master degree program

-To everyone who has a place for me and all my friends and relatives.

Maram Obiedat 2019 / 2020

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List of Abbreviations

#	Abbreviation	Full Expression
1	HWR	Handwriting Recognition
2	CASE	Computer-Aided Software Engineering Tools
3	UI	User Interface
4	GUI	Graphical User Interface
5	SE	Software Engineering
6	RFC	Random Forest Classifier
7	K-NN	K-Nearest Neighbor
8	CNN	Convolutional Neural Network
9	SVM	Support Vector Machine
10	AI	Artificial Intelligence

Abstract

The process of creating a user-friendly interface is considered one of the most important processes that may catch the glimpse of the eye. Creating a user interface is a challenging topic that enables the end-users to interact with the internal system.

This thesis focuses on designing and placing controls on a given form, this can resolve the shortage of the experienced programmers of the front end and reduce the time and effort of the implementation. The main contribution of this research is to present a smart case tool algorithm to create a graphical user interface by using a novel pattern recognition approach. This is applied based on machine learning by recognizing the hand drawing. The algorithm is applied to recognize a specific set of controls such as: Textbox, Picture Box, Button, and Checkbox. The conducted experiments have revealed promising results for the future of the front end implementation. Regular users are able to create user interfaces without being familiar with the code and with less time and effort.

Keywords: Smart CASE Tool, Hand Drawing Recognition, Handwriting Recognition, Gesture Features, Graphical User Interface, Machine Learning, Features Detection, Features Recognition.