# GUI TEST CASE MINIMIZATION USING EVENT FLOW MAPS

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# APPROVAL SHEET

## THESIS COMPLETION CERTIFICATE

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# ABSTRACT

GUI testing is an important aspect of conventional software testing where we intend to execute underlying functionality considering business requirements. Regression testing verifies if software previously developed and tested still performs correctly after it was changed or incorporated with other software components. Some modules that are changed perform all the functionality correctly and are verified as well as validated.

Test case minimization techniques are used to minimize the testing cost in terms of execution time, resources through reducing number of test cases. We generate a set from test suite that satisfies all the requirements of original test suite with minimum number of test cases.

We propose sequence recording technique to report coverage and present a test case minimization using our sequence recording. To evaluate our proposal, we developed application to perform analysis and show results. It is type of manual testing approach in which sequence of events are recorded.

All the recorded events are clustered using data mining algorithm K-Means and similar clusters are grouped together. After clustering search sequence is performed and all the test cases that are generated are listed based on size.

Our results are comparable with Microsoft coded UI framework test engine results. We generated the UI map from Microsoft coded GUI in visual studio in which all interface components are verified and compare this UI map with our event map and hence proved that there is no change in sequence when the user visits GUI.

Test case minimization is performed based on which short sequence test cases are on the top in the list and the test cases that contain longer sequence are listed afterwards. This create ease for the tester and able to evaluate all the test cases and it saves time and execution of test cases.

# DEDICATION

I am dedicating this thesis to most beloved people, a special feeling of gratitude to my loving parents. Thank you both for giving me strength to chase my dreams and for your full support and motivation.

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# ABBREVIATIONS

PMS: Profile Management system

MBT: Model Based Testing

EFG: Event Flow Graph

FA: Finite Automata

ESG: Event Sequence Graph

GUI: Graphical User Interface

UI: User Interface

DART: Daily Automated Regression Tester

AUT: Application Under Test

SUT: System Under Test

SM: Systematic Mapping

GQM: Goal Question Metric

UML: Unified Modelling Language

ACO: Ant Colony Optimization

MLRT: Multiple level regression testing technique

HGS: Harrold Gopta Sofa (Testing algorithm)

CUIT: Coded UI test

TFS: Team Foundation Server

QTP: Quality Test Professional