



# **Software Requirement Elicitation Using AI Techniques**

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The undersigned have examined the thesis entitled '*Software Requirement Elicitation Using AI Techniques*' presented by **Rawan Al-Heisa**, a candidate for the degree of Master of Science in Software Engineering and hereby certify that it is worthy of acceptance.

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## DEDICATION

I DEDICATE THIS THESIS TO THE *MARTYRS OF JORDAN*, WHO WE OWE THEM A LOT, "MAY GOD ACCEPT THEM AND SHOWER HIS MERCY ON THEM " ...

TO MY MOTHER AND FATHER WHO TAUGHT ME HOW TO WORK HARD...

TO MY HUSBAND, THE PERSON WHO ALWAYS ENCOURAGED ME TO KEEP WORKING....

TO MY BROTHERS, SISTERS, AND MY FRIENDS FOR THEIR ENTHUSIASM, FOR SHARING WITH ME MY DIFFICULT MOMENTS, AS WELL AS FOR GIVING ME THE FULL SUPPORT WHENEVER I NEEDED.

*Rawan H. 2017*

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## LIST OF ABBREVIATIONS

Abbreviation	Description
SDLC	Software Development Life Cycle
SRS	Software Requirements Specification
ISRA	Intelligent Software Requirement Analyzer
ANN	Artificial Neural Network
AI	Artificial Intelligence
NLP	Natural Language Processing
IDE	Integrated Development Environment
NL	Natural Language
KBS	Knowledge Based System
FL	Fuzzy Logic
BPNN	Back Propagation Neural Network
RE	Requirements Engineering
NL	Natural Language
Quasars	Quality Analyzer of Requirements Specification
JAD	Joint Application Development
AHP	Analytic Hierarchy Process
QFD	Quality Function Deployment
UML	Unified Modelling Language
UMGAR	UML Model Generator from Analysis of Requirements
RNN	Recurrent Neural Network
NLRS	Natural Language Requirements Specification
SBVR	Semantic Business Vocabulary and Rules
NL2 SBVR	Natural Language to Semantic Vocabulary Rules
NL2UMLvia SBVR	Natural Language to UML via semantic Business Vocabulary and Rules
CBR	Case Based Reasoning
SE	Software Engineering
ANNI	A Nearly-New Information Extraction system
GUI	Graphical user interfaces
LRs	Language Resources
PRs	Processing Resources
VRs	Visual Resources
POS	Part of speech

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**Abstract**

The Software Development Life Cycle (SDLC) process is a continuous activity, which encompasses multiple phases. The most fundamental and essential phase in every SDLC is the requirement engineering phase. The final output from this phase represents a contract between the customer and the software engineer. It has been the most important and time-consuming phase since it can determine the success or the failure delivery of the software project. The requirements are being written in natural language. Natural language has an ambiguous nature and it is not fully standardized when it comes to the requirements gathering and writing. The fact that the requirements are written in natural language leads to the conclusion that they might cause some confusion and misunderstanding. This will be shown and further explained later when the developer defines the table of Software Requirements Specification (SRS). For the aforementioned reasons, in this thesis, we have developed an Intelligent Software Requirement Analyzer (ISRA) methodology, based on an Artificial Intelligence (AI) technique, that uses the Artificial Neural Network (ANN) to deal with Natural Language Processing (NLP) applications. Our work's core function is, tackling the natural language text intelligently and tokenize the requirements' text. Ultimately, to have clear and understandable tokens. The proposed ISRA methodology results show that using it will significantly help, speed-up and enhance the generation a components of SRS . ISRA has been implemented using MATLAB® Integrated Development Environment (IDE), which offers flexible programming objects for developing Neural Networks (NN), as well as other essential objects and plug-in capabilities.