November 2025: Top 10 Cited Articles in Software Engineering & Applications

International Journal of Software Engineering & Applications (IJSEA)** ERA Indexed **

ISSN : 0975 - 9018 (Online); 0976-2221 (Print)

https://www.airccse.org/journal/ijsea/ijsea.html

Citations, h-index, i10-index

Citations 5805 h-index 36 i10-index 127

Intelligent Knowledge Database (IKD) Tool for Formal Methods

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ABSTRACT

This paper discusses the Intelligent Knowledge Database (IKD) tool generated for formal methods. The knowledge database provides the information regarding the existing formal methods in the area of academia, industry and R&D sectors. The tool provides complete information about the formal methods adopted in the conventional or model-based approach, in the various phases of the software development life cycle process, list of tools using formal techniques with their version and published literature supporting formal methods. This knowledge-database serves as a live encyclopedia which will enable the engineers and researchers interested in the field of formal methods. The database is intelligent because it provides the user with the flexibility of searching the formal method related information using keyword similar to the search engine. This is a unique tool for formal methods encompassing most of the published literature with intelligent search options.

KEYWORDS

Formal methods, Information retrieval, Verification and Validation, SDLC Phases, Encyclopedia, Database, Live database tool.

For More Details : **https://airccse.org/journal/ijsea/papers/3612ijsea09.pdf**

Volume Link : **https://www.airccse.org/journal/ijsea/vol3.html**

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TECHRISK - A DECISIONAL FRAMEWORK TO MEASURE TECHNICAL DIMENSIONS OF LEGACY APPLICATION FOR REJUVENATION THROUGH REENGINEERING

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ABSTRACT

Competitive business environment wants to modernize existing legacy system in to self-adaptive ones. A variety of options are available to renovate legacy system in to more contemporary system. Recently the phenomenon of "software reengineering ", a methodology to allow old ways of thinking to be replaced with new, fresh approaches to increase productivity and quality of system, has been reported. However evolving legacy system through reengineering is a risky and error – prone task due to extensive changes it requires in the majority of cases. Therefore cost effective reengineering requires identifying and measuring impact of system, managerial and technical risk. We present a technical domain framework TechRisk to identify and measure quality and functional dimensions of legacy system. The objective is to identify those risk factors of technical domain which are critical to the success of reengineering. Proposed decision driven framework TechRisk provide support to identify and eliminate the highest impact risks in the software reengineering process and help to create a successful reengineering solution.

KEYWORDS

TechRisk, Reengineering, Risk engineering, Legacy system, Software quality, Domain

For More Details :**https://www.airccse.org/journal/ijsea/papers/0711ijsea09.pdf**
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INTEGRATING SOFTWARE REPOSITORY MINING: A DECISION SUPPORT CENTERED APPROACH

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ABSTRACT

Mining software repositories (MSR) research had significantly contributed to software engineering. However, MSR results integration across repositories is a recent concern that is getting more attention from researchers each day. Some noticeable research in this sense is related to the approximation between MSR and semantic web, specially linked data approaches which makes it possible to integrate repositories and mined results. Manifested that way, we believe that current research is not fully addressing the practical integration of MSR results, specially, in software engineering due to not considering that these results needs to be integrated to the tools as assistance to activity performers, as a kind of decision making support. Based on this statement this research describes an approach, named Sambasore, which is concerned with MSR results inter-repository ntegration and also to decision making support processes, based on tool assistance modelling. To show its feasibility we describe the main concepts, some related works and also a proof of concept experiment applied to a software process modelling tool named Spider PM.

KEYWORDS

Network Protocols, Wireless Network, Mobile Network, Virus, Worms &Trojon

For More Details : **https://airccse.org/journal/ijsea/papers/3612ijsea05.pdf**

Volume Link : **https://www.airccse.org/journal/ijsea/vol3.html**

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A METHODOLOGY TO EVALUATE OBJECT ORIENTED SOFTWARE SYSTEMS USING CHANGE REQUIREMENT TRACEABILITY BASED ON IMPACT ANALYSIS

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ABSTRACT

It is a well known fact that software maintenance plays a major role and finds importance in software development life cycle. As object-oriented programming has become the standard, it is very important to understand the problems of maintaining object-oriented software systems. This paper aims at evaluating object-oriented software system through change requirement traceability – based impact analysis methodology for non functional requirements using functional requirements. The major issues have been related to change impact algorithms and inheritance of functionality.

KEYWORDS

Change Requirement Traceability, Impact Analysis, Object-Oriented Software Systems, Software Maintenance, Change Impact algorithms, inheritance of functionality.

For More Details : **https://airccse.org/journal/ijsea/papers/5314ijsea04.pdf**

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A Literature Survey of Cognitive Complexity Metrics for Statechart Diagrams

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ABSTRACT

Statechart diagrams have inherent complexity which keeps increasing every time the diagrams are modified. This complexity poses problems in comprehending statechart diagrams. The study of cognitive complexity has over the years provided valuable information for the design of improved software systems. Researchers have proposed numerous metrics that have been used to measure and therefore control the complexity of software. However, there is inadequate literature related to cognitive complexity metrics that can apply to measure statechart diagrams. In this study, a literature survey of statechart diagrams is conducted to investigate if there are any gaps in the literature. Initially, a description of UML and statechart diagrams is presented, followed by the complexities associated with statechart diagrams and finally an analysis of existing cognitive complexity metrics and metrics related to statechart diagrams. Findings indicate that metrics that employ cognitive weights to measure statechart diagrams are lacking.

KEYWORDS

UML, Statechart diagrams, Software metrics, Cognitive complexity metrics, statechart complexity metrics

For More Details : **https://aircconline.com/ijsea/V10N4/10419ijsea03.pdf**

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EA-MDA Model to Resolve is Characteristic Problems in Educational Institutions

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ABSTRACT

Higher education institutions require a proper standard and model that can be implemented to enhance alignment between business strategy and existing information technologies. Developing the required model is a complex task. A combination of the EA, MDA and SOA concepts can be one of the solutions to overcome the complexity of building a specific information technology architecture for higher education institutions. EA allows for a comprehensive understanding of the institution's main business process while defining the information system that will assist in optimizing the business process. EA essentially focuses on strategy and integration. MDA relies on models as its main element and places focuses on efficiency and quality. SOA on the other hand uses services as its principal element and focuses on flexibility and reuse. This paper seeks to formulate an information technology architecture that can provide clear guidelines on inputs and outputs for EA development activities within a given higher education institution. This proposed model specifically emphasises on WIS development in order to ensure that WIS in higher education institutions has a coherent planning, implementation and control process in place consistent with the enterprise's business strategy. The model will then be applied to support WIS development and implementation at University of Lampung (Unila) as the case study

KEYWORDS

Enterprise Architecture, Web Information system, Higher Education, MDA, SOA

For More Details : **https://airccse.org/journal/ijsea/papers/4313ijsea01.pdf**

Volume Link : **https://www.airccse.org/journal/ijsea/vol4.html**

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LEAN THINKING IN SOFTWARE ENGINEERING : A SYSTEMATIC REVIEW

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ABSTRACT

The field of Software Engineering has suffered considerable transformation in the last decades due to the influence of the philosophy of Lean Thinking. The purpose of this systematic review is to identify practices and approaches proposed by researchers in this area in the last 5 years, who have worked under the influence of this thinking. The search strategy brought together 549 studies, 80 of which were classified as relevant for synthesis in this review. Seventeen tools of Lean Thinking adapted to Software Engineering were catalogued, as well as 35 practices created for the development of software that has been influenced by this philosophy. The study provides a roadmap of results with the current state of the art and the identification of gaps pointing to opportunities for further research.

KEYWORDS

Lean Thinking, Lean IT, Agile, Software Engineering, Software Development, Systematic Review

For More Details : **https://aircconline.com/ijsea/V8N3/8317ijsea02.pdf**
Volume Link : **https://www.airccse.org/journal/ijsea/vol8.html**

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CONTEXT AWARE CLUSTERING USING GLOVE AND K-MEANS

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ABSTRACT

In this paper we propose a novel method to cluster categorical data while retaining their context. Typically, clustering is performed on numerical data. However it is often useful to cluster categorical data as well, especially when dealing with data in real-world contexts. Several methods exist which can cluster categorical data, but our approach is unique in that we use recent text-processing and machine learning advancements like GloVe and t- SNE to develop a a context-aware clustering approach (using pre-trained word embeddings). We encode words or categorical data into numerical, context-aware, vectors that we use to cluster the data points using common clustering algorithms like K-means.

KEYWORDS

Natural language processing, context-aware clustering, k-means, word embeddings, GloVe, t-SNE

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A NOVEL EFFORT ESTIMATION MODEL FOR SOFTWARE REQUIREMENT CHANGES DURING SOFTWARE DEVELOPMENT PHASE

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ABSTRACT

Software Requirements Changes is a typical phenomenon in any software development project. Restricting incoming changes might cause user dissatisfaction and allowing too many changes might cause delay in project delivery. Moreover, the acceptance or rejection of the change requests become challenging for software project managers when these changes are occurred in Software Development Phase. Where in Software Development Phase software artifacts are not in consistent state such as: some of the class artifacts are Fully Developed, some are Half Developed, some are Major Developed, some are Minor Developed and some are Not Developed yet. However, software effort estimation and change impact analysis are the two most common techniques which might help software project managers in accepting or rejecting change requests during Software Development Phase. The aim of this research is to develop a new software change effort estimation model which helps software project manager in estimating the effort for software Requirement Changes during Software Development Phase. Thus, this research has analyzed the existing effort estimation models and change impact analysis techniques for Softwrae Development Phase from the literature and proposed a new software change effort estimation model by combining change impact analysis technique with effort estimation model. Later, the new proposed model has been evaluated by selecting four small size software projects as case selections in applying experimental approch. The experiment results show that the overall Mean Magnitude Relative Error value produced by the new proposed model is under 25%. Hence it is concluded that the new proposed model is applicable in estimating the amount of effort for requirement changes during SDP.

KEYWORDS

Software Change Effort Estimation, Software Requirement Changes, Function Point Analysis, Constructive Cost Model and Software Development Phase.

For More Details : **https://aircconline.com/ijsea/V9N6/9618ijsea02.pdf**

Volume Link : **https://www.airccse.org/journal/ijsea/current.html**

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INVESTIGATING GAME DEVELOPERS' GUILT EMOTIONS USING SENTIMENT ANALYSIS

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ABSTRACT

Game Development is one of the most important emerging fields in software engineering era. Game addiction is the nowadays disease which is combined with playing computer and videogames. Shame is a negative feeling about self evaluationas well as guilt that is considered as a negative evaluation of the transgressing behaviour, both are associated withadaptive and concealing responses. Sentiment analysis demonstrates a huge progression towards the understanding of web users' opinions. In this paper, the sentiments of game developers are examined to measure their guilt's emotions when working in this career. The sentiment analysis model is implementedthrough the following steps: sentiment collector, sentiment pre-processing, and then machine learning methods were used. The model classifies sentiments into guilt or no guilt and is trained with 1000 Reddit website sentiment. Results have shown that Support Vector Machine (SVM) approach is more accurate incomparison to Naïve Bayes (NV) and Decision Tree.

KEYWORDS

Ethics, Game Addiction, Guilt Emotions, Software Engineering, Sentiment Analysis Model& Value Sensitive Design

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