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Selected Publication Lists:

2008

- Tanya, W., Vatanawood, W., "Development of a Three Dimensional Geographic Information System for Visualizing Distributed Transmission Lines at 115 kV", to be published in Proceedings, The 5th International Conference on Information Technology and Application (ICITA2008), 23-26 June, Queenland, Australia, 2008.
- Auechaikul, T., Vatanawood, W., "A Development of Business Rules with Decision Tables for Business Process", to be published in Proceedings, The 5th International Joint Conference on Computer Science and Software Engineering (JCSEE2008), May 7-9, Kanchanaburi, Thailand, 2008, pp246-251.
- Danchai, W., Vatanawood, W., "A Development of Dspace Programming Interface for Research Summary Reports", to be published in Proceedings, The 5th International Joint Conference on Computer Science and Software Engineering (JCSEE2008), May 7-9, Kanchanaburi, Thailand, 2008, pp503-510. (in Thai)
- Assawachartthongchai, S., Vatanawood, W., "Single Search System for Digital Library", to be published in Proceedings, The 5th International Joint Conference on Computer Science and Software Engineering (JCSEE2008), May 7-9, Kanchanaburi, Thailand, 2008, pp380-387. (in Thai)

2007

- Auechaikul, T., Vatanawood, W., "A Development of Business Rules with Decision Tables for Business Process", Proceedings, IEEE TENCON 2007 (TENCON2007), Taipei, International Convention Center, October 10 - November 2, 2007.

2006

- Auechaikul, T., Vatanawood, W., "A Development of Web Services Sequencer for Business Process", Proceedings, the 10th National Computer Science and Engineering Conference (NCSEC 2006), University of Khonkaen, Khonkaen, Thailand, 25-27 October, 2006 (in Thai)
- Sae-ueng, P., Chaithammaprakorn, S., Vatanawood W., "Institutional Repository for Digital Library", Proceedings, the 10th National Computer Science and Engineering Conference (NCSEC 2006), University of Khonkaen, Khonkaen, Thailand, 25-27 October, 2006 (in Thai)

- Pukkhem, N. and Vatanawood, W.(2006) "The Sequence Pattern Combination Model for Solving Various Content Aggregation Designs Problem," Proceedings,The International Conference on e-Learning (ICEL 2006), June 22-23, Montreal, Canada, 2006
- Pukkhem, N., Evens, M.W. and Vatanawood, W.(2006) "An Estimation Function for Selecting the Suitable Learning Objects in Adaptive Education Systems", In Proceedings of the 4th International Conference on Education and Information systems, Technologies and Applications: EISTA'06), July 20-23, Orlando, Florida, USA, 2006.
- N. Pukkhem, M. Evens, W. Vatanawood, "The Concept Path Combination Model for Supporting a Personalized Learning Path in Adaptive Educational Systems," Proceedings, the 2006 International Conference on e-Learning, e-Business, Enterprise Information Systems, e-Government, and Outsourcing (EEE'06), June 26-29, Las Vegas, USA, 2006. pp.10-16.

2005

- Pukkhem, N. and Vatanawood, W. (2005) "A Multi-Instructor Cooperative Model for Supporting Learning Objects Aggregation based on XML-Based Planning Strategy," WSEAS Transactions on Computer, Vol.4, Iss. 10, October 2005, pp1390-1398.
- N. Pukkhem, and W. Vatanawood, " A Course Blueprint Designs using Learning Objects Approach and XML-Based Planning for Multi-Instructors Learning Systems," Proceedings, 5th WSEAS International Conference on Distance Learning and Web Engineering, DIWEB2005, Corfu, Greece, August 23-25, 2005.
- N. Pukkhem, and W. Vatanawood, "Instructional Design Using Component-Based Development and Learning Object Classification," Proceedings, ICALT2005, Taiwan, 2005, pp. 492-494.

2004

- S. Napapak, W. Vatanawood, "Transformation of Class Diagrams into Z Specifications," Proceedings, Software Engineering Research and Practice 2004, Las Vegas, U.S.A., 2004. pp. 387-392.

- S. Tongleamnak, N. Covavisaruch and W. Vatanawood, "Programmable Web-based Volume Visualization", Proceedings, the 1st ECTI Annual Conference (ECTI-CON 2004), Pattaya, 13-14 May 2004. pp. 165-168.

- K. Simmami, N. Covavisaruch, W. Vatanawood and W. Ratanachai, "Computer Aided Distal Locking Guidance of Intramedullary Nail by X-ray Image Analysis", Proceedings, the 3rd Engineering Senior Project and Thesis Seminar, Faculty of Engineering, Chulalongkorn University, Bangkok, 18-19 Mar 2004.

- N. Covavisaruch, K. Simmami, W. Vatanawood and W. Ratanachai, "Computer Aided Distal Locking Guidance of Intramedullary Nail by X-ray Image Analysis", Proceedings, SPIE International Symposium on Medical Imaging 2004, San Diego, CA, 14-19 February 2004.

- J. Chin-anuparb, W. Vatanawood and N. Covavisaruch, "VisDIP-Tool: A Visual Environment DIP Tool", Proceedings, the National Computer Science and Engineering Conference (NCSEC 2003), Chonburi, 28-30 October 2003. pp. 347-352. (in Thai)

2003

- J. Chin-anuparb, W. Vatanawood and N. Covavisaruch, "VisDIP-Tool: A Visual Environment DIP Tool", Proceedings, the National Computer Science and Engineering Conference (NCSEC 2003), Chonburi, 28-30 October 2003. pp. 347-352. (in Thai)

2002

- K. Simmami, N.Covavisaruch, W. Vatanawood and W. Ratanachai, "A Distortion Correction Method of Fluoroscopic X-ray Images," Proceedings, National Computer Science and Engineering Conference (NCSEC 2002), Pattaya, 29-31 October 2002. pp. 78-83. (in Thai)

- W. Vatanawood and W. Rivepiboon, "Formal Specification Scheme for Database Applications using Requirement Particle Networks", International Journal for Computer-Aided Engineering and Software – Engineering Computations, Vol.19, No.7 and 8, 2002, ISSN 0264-4401.

Abstract This paper proposes an automatic scheme for synthesizing formal specification from the definitions of relational data model – entity relationship diagram and their data dictionaries. The formal specification of both structural and behavioral properties of relational data model is generated in Z schemas. In our approach, the mandatory structural constraints – the uniqueness of primary key, foreign keys, and referential integrity constraints among the relations in the model, are preserved. We propose a set of transformation rules to exhaustively produce Z schemas of the states and primitive operations – cascade insertion, deletion, and updating. Moreover, a composition technique of constructing the composite operations is presented by using Requirements Particle Networks. The revision of the formal specification can be easily conducted with the mathematical proofs of the properties of the data model using   Z   prover   tool.
keywords: Formal Specification Synthesis, Relational Data Model, Requirements Particle Networks

2001

- M. Rattichote and W. Vatanawood, "A Formal Specification Method from State Diagram", Proceeding of The 2nd International Conference on Intelligent Technologies 2001 (InTech 2001), November 2001.

Abstract: This paper proposes a formal specification method by using the transformation rules to map state diagram notations into CafeOBJ specification, a novel successor of OBJ algebraic language. The transformation rules are used as a guideline to consider each component of UML state diagram and provide a corresponding formal definition in CafeOBJ syntax. In our approach, we imply that each state

diagram describes the behavior property of an object. Both static system and dynamic system of CafeOBJ are covered. We demonstrate our formal specification method with a case study and the correctness of final specification from our method is proved with CafeOBJ interpreter.
Key words*: Formal specification, Transformation rule, State diagram, CafeOBJ language*

- K. Kitiyanun and W. Vatanawood, "An Online Handwritten Recognition System Environment", Proceeding of The 2nd International Conference on Intelligent Technologies 2001 (InTech 2001), November 2001.

Abstract*: This paper proposes an online handwritten recognition system environment. In our approach, the backpropagation neural network is used in the recognition phase. Our environment helpfully reduces the time to develop handwritten recognition software. We provide the front-end application for researcher to conduct recognition experiments with different preprocess and feature extraction methods rapidly. Python interpreter is exploited to perform the encoding methods. A new method can be plug-in without ripple effect to the main application. Moreover, the structure of neural network can be adjusted via our GUI interface. The Stuttgart Neural Network Simulator (SNNS) is used in our experiments while a relational database is applied for managing the handwritten data of multi-writers.*
Key words*: backpropagation, online handwritten recognition environment*

- W. Vatanawood, W. Hiranpiwong and W. Rivepiboon*,* "An Automatic Generation of Java Data Object Class from Z Specification", Proceeding of The International Conference on Information Technology for the New Millennium, (ICONIT2001), May 28-30, 2001.

Abstract: *A scheme of automatic generation of Java source code from formal specification is proposed. As a consequence of our previous research on transformation of Entity-Relationship definitions of relational data model to the Z specifications, we demonstrate the automatic generation of Java data object class from those Z specifications. Moreover, the encapsulated object methods of data manipulation are generated as well, in order to perform the animation of the Z specification. By invoking the appropriate object manipulations embedded in each data object, the preliminary verification of the specified relational data model can be repeatedly conducted in Java programming environment.*

2000

- W. Vatanawood, V. Sriratanalai and W. Rivepiboon, "Formal Specification Synthesis for Database Applications", Proceeding of The International Conference on Intelligent Technologies 2000 (InTech 2000), December 2000.

Abstract: This paper proposes an alternative scheme of formal specification synthesis. As to motivate one further step for automatic synthesis scheme, semi-formal models such as Entity relationship diagrams (ERD) with data dictionary and relationship dictionary are used to generate formal specification. We aim to provide a set of transformation rules and algorithms to synthesize a complete version of formal specification in Z for database application with referential integrity concern. In our approach, database application is considered as structural property of data entity and basic behavioral property of primitive data manipulations, such as insert, delete and update operation.
Keywords: Formal Specification Synthesis, Z notation, ER diagram

- R. Vorajenwanich, W. Vatanawood and W. Rivepiboon, "A Formal Approach to Recover Design Specification from C Program Code", Proceeding of The National Computer Science and Engineering Conference, 16-17 November, 2000, Queen Sirikit National Convention Center, Bangkok, Thailand.

Abstract: In software evolution process the consistency of a changing system should be maintained. The usability of the existing system depends on its related up-to-date documents. In this paper is proposed a set of rules for regenerating or recovering design specification of the software system from C program code. Our approach is considered as an alternative approach to synchronize documentation and existing program code during the evolution process of software system.
Keywords: Reverse Engineering, Formal Method

- W. Vatanawood, W. Kamchornwate and W. Rivepiboon, "Requirements Particle Networks: An Approach to Software Functional Requirements Modelling", Proceeding of the IASTED International Conference on Applied Simulation and Modelling, ISBN 0-88986-294-X, ISSN 1021-8181, July 24-27, 2000, Banff, Alberta, Canada.

Abstract: In this paper, an approach to software functional requirements modelling using requirements particle networks is presented. In our approach, a set of requirements particles is defined as an essential tool to construct a visual model of software functional requirements specification during the software analysis phase and the relevant formal specification is systematically generated without the experience of writing formal specification. A number of algorithms are presented to perform these formal specification transformations using predefined templates of formal specification schema of the requirements particles. The usability of the requirements particle networks is investigated by conducting a workshop. The result indicates that an analyst with experience in writing data flow diagram is capable to produce a complete and consistent requirements particle networks.
Keywords: modelling, formal specification, software requirements specification, requirements particle network

- N. Lapjitgkusol, W. Vatanawood and W. Rivepiboon, "Simulating Software Requirements Specification in Z", Proceeding of The 4th Annual National Symposium on Computational Science and Engineering (ANSCSE), 27 - 29 March 2000, Faculty of Engineering, Kasertsart University.

Abstract: An alternative of simulating software requirements specification in Z is proposed using the modified procedural approach. We present several algorithms to prepare Z specification in appropriate order and to translate into Prolog program. In the early stage, the software developer will be provided with a scheme to demonstrate the functional behavior of the target software system from requirements specification. In addition, a set of Prolog rules is designed for each Z notation as to simplify the translating process.
Keywords: software requirements specification, Z notation, Prolog program, Language simulation

- W. Vatanawood, "3-Dimensional Wireframe Editing Software", Proceeding of The 38th Kasetsart University Annual Conference, 1-4 February 2000.

Abstract: This research proposes a "Three Dimensional WireFrame Editing Software". This program, developed using Object-Oriented Programming technique, can be used to create three dimensional wireframe model. In our approach, the primitive data elements to define a wireframe object are Point and Line. Our wireframe editing software provides a set of computer graphical primitive tools for wireframe object transformation such as translation, rotation, scaling features, zoom control, group and ungroup objects etc. Moreover, the multiple view ports are provided to illustrate 2-Dimensional and 3-Dimensional wireframe model drawing on computer raster monitor so that the end user can easily comprehend the model. In addition, a set of new primitive data elements can be systematically added according to the advantage of using Object-Oriented Programming technique. The program was tested and it is found that the wireframe editing software works correctly, efficiently and is convenient to use.
Keywords: wireframe editor, 3-dimensional wireframe model

1999

- S. Tachapisuth, W. Vatanawood, "A Development of Source Code Control System with Data Coupling Dependency Alert", Proceeding of The National Computer Science and Engineering Conference 1999.

Abstract: In this research, the source code control system is developed using delta storage technique as to save storage. It means that source codes common to more than one version is not duplicated. The developer is capable to retrieve previous multiple versions of program source codes, if needed. Moreover, an extended feature is proposed during the source code control task as to alert the functional dependency among modules of program source codes. In our approach, data coupling metric is exploited to identify the functional dependency between two modules. The data coupling dependency checking feature requires only program source codes as input alone without any information from design document. It should be one of the practical software configuration management tools to handle and control the existing uncompleted documented software system. The proposed system has been tested using synthetic test source codes of medium-scale 4GL application. The results are satisfactory. The information on how many related modules of program source codes will be affected as the consequence of the changes of source codes, is necessary in the early stage. The developer is able to manage the risk of the changes of source codes and to reduce the ripple effect that means when errors occur at one location and propagate through a system.
Key words: data coupling, source code control system, functional dependency, 4GL.

- S. Watcharabusaracum, T.Suwannasart, W. Vatanawood, "A Construction of COCOMO II' s Rating Scale of Cost Driver Using Inductive Decision Tree", Proceeding of The National Computer Science and Engineering Conference, 1999.

Abstract: In order to estimate software development cost using COCOMO II, users need to identify rating scale for 17 cost drivers. This research proposes a method to derive the cost drivers' rating scale. We design a set of questions for the users. The answers to the questions are processed to determine the rating scale by using the Inductive Decision Tree. Experiments show that the estimated software cost using the method is similar to the estimated software cost using COCOMO II with 95 % confidence level.
Keywords: COCOMO II, Cost Drivers, Rating Scale, Inductive Decision Tree

- C. Kesa, W. Vatanawood, "Increasing the Service Performance of HTTP Protocol", Proceeding of The 1999 Annual Conference Engineering Institute of Thailand, Engineering Institute of Thailand under H.M. the King's Patronage, Bangkok, 1999. (Thai)

Abstract: The performance of computer technology has been increasing at present, particularly Internet access. The number of Internet users is increasing continuously therefore it causes the bandwidth consumed, not enough to serve the satisfaction of users who use World Wide Web. They have to wait a long in order to get their data transferred. The objective of this research is to experiment the network model in order to increase the service performance in response time as well as calculate the cache size in appropriate size of Internet growth by using statistical analysis. The university network is selected as our research field.
Keywords: Service performance, HTTP protocol

- A. Sajjapont, W. Vatanawood and N. Covavisaruch, "On-line Handwritten Thai Characters Recognition", Proceeding of The 3rd Annual National Symposium on Computational Science and Engineering (ANSCSE), 24 - 26 March 1999, Faculty of Science, Chulalongkorn University.

Abstract: *One of the most challenging topics is the recognition of Thai handwriting, especially on-line recognition. All Thai alphabetical characters can be written in certain styles with strokes of different shapes and positions. An on-line handwritten character written on a digitizing tablet is represented as a sequence of strokes, which are the loci of the pen tip from its pen-down to pen-up positions. This paper presents an approach to on-line handwritten Thai character recognition characterized by a sequence of dominant points in strokes and a sequence of writing directions using a Freeman code of the consecutive dominant points. The directional information of the dominant points and sequence of changes in angles of the data points are used for classification by back-propagation neural network. This technique is elastic, in that it can tolerate local variation and deformation. Experiments have been conducted to recognize 67 Thai handwritten characters and performed on single writer's data. The recognition rate is 83.43%, with 2.16% incorrect rate and 14.41% rejection rate.*
Keywords: *On-line handwritten recognition, Thai character recognition, Neural network*

- W. Vatanawood and S. Siangsuebchart. "Event Tracking System for Highway in Geographic Information System", Proceeding of The 37th Kasetsart University Annual Conference, February 1999. (Thai)

Abstract: *This research propose an alternative to record and track all events happened on highway roadmap. Those events are classified into either linear event or point event. A linear event is defined with a starting position and an end position of contiguous homogenous event while a point event is defined with an exact single position of event. The main objective of this research is to design a system model for representing events that independently exploit existing route database in GIS. The existing route database will not be effected with any modification of event data. Moreover, events are recorded with no limit. Dynamic segmentation technique is implemented to obtain the expected data structure of events. An existing route database in CU-GIS program, surveyed in scale of 1:1,000,000, is used and highway roadmap, in scale of 1:1,600,000, is defined to test of recording and tracking events. As the results, any modification on events will have no effect to the existing route database, at all. The event data can be recorded up to the maximum capacity of hard disk. The event searching and browsing features are effective and correct*
Keywords: *Geographic information system, Dynamic segmentation, Event tracking system*

- W. Vatanawood and P. Wetborisoot "A Development of Multimedia Presentation System using RTF Manuscript", Proceeding of The 37th Kasetsart University Annual Conference, February 1999. (Thai)

Abstract: *This research proposes an alternative to construct multimedia presentation system of manuscript prepared by Microsoft Word as word processor. No need at all to use any computer aided instruction program. The main concept is to compile Microsoft Word-ready manuscript, saved in RTF format, into an appropriate intermediate media file for distribution to reader. As the results of this research, a RTF compiler program was developed to produce an intermediate media file from RTF manuscript. All of text messages, pictures are composed in searchable format using keyword-search technique. Moreover, a multimedia viewer program was developed as well to facilitate the reader with additional features such as search using keywords, hypertext feature which provide reader to jump to next relevant content, pop-up description window, annotation message. The main features of our system have been tested and the results are satisfied. However, the multimedia viewer takes more time than expectation to perform screen painting due to the programming language used.*
Keywords: *RTF format, Multimedia presentation*

- W. Vatanawood and P. Chongstitvatana, "A Genetic Algorithm Approach to Software Components Search using Software Functional Requirement Checklist", accepted by 3rd Annual National Symposium on Computational Science and Engineering (ANSCSE), 24 - 26 March 1999, Faculty of Science, Chulalongkorn University.

Abstract: In this paper, we present genetic algorithm for software components searching at the early stage of conceptual design. We propose an alternative to convert software functional requirements checklist, a mandatory checklist in software requirements specification document produced by software analyst, into a set of computational operations which is needed as the key to search for software component candidates from component libraries. Moreover, component searching is practically performed to select not only the most relevant candidate but also several feasible sets of component candidates that are capable to satisfy all expected operations.

In our approach, it is considered as an optimization problem to search a set of software component candidates that is most fit to given constraints. To consider at least N software components and at least T operations expected to satisfy the functional requirements of an application, the component search space is exponential. In our experiments with synthetic data, we investigated the case of N = 250 and T = 250. The results demonstrated that genetic algorithm is applicable and produces a set of solutions along with the order of merit.

Keywords: Software Component Searching, Genetic algorithm

1998

- W. Vatanawood and W. Tangtiyaphant. "A Data Coupling and Control Coupling Measurement for Preliminary Structural Design using Offutt and Associates' Algorithms", Proceedings of The National Computer Science and Engineering Conference 1998, October 1998.

Abstract: Data coupling and control coupling may be measured and considered during preliminary design to avoid some propagated errors in the detailed design and implementation phase. Using data dictionary and input-process-output descriptions that are common documents from analysis phase, we examine an alternative to measure data coupling and control coupling using Offutt and associates's algorithms. A software tool has been developed to parse unlimited sizes of data dictionary and input-process-output description text files and to compute the measure of data coupling and control coupling. Moreover, pairs of modules with the high values of coupling measurement are located automatically. Perl programming language is used to develop the tool to enable portability feature and the results of the measurement are reported in HTML format.

Keywords: software design, data coupling, control coupling input-process-output, data dictionary