

AGENT BASED SOFTWARE DEVELOPMENT

Prateek Arora¹, Prakarsha Malhotra², Ishank Lakhmani³, Jigyasa Srivastava⁴

¹15bce0058, ²15bce0138, ³15BCE0240, ⁴15BCE2080

Department of SCOPE, VIT university, Vellore

I. ABSTRACT

Agent-based computing is a promising approach for developing applications in complex domains. The technology of intelligent agents and multi-agent systems seems set to radically alter the way in which complex, distributed, open systems are conceptualized and implemented. Despite the great deal of research in this area, a number of challenges still need to be faced (i) to make agent-based computing a widely accepted paradigm in software engineering practice, and (ii) to turn agent-oriented software abstractions into practical tools for facing the complexity of modern application areas. In this paper we include a brief introduction of Agent based software development followed by a review of the work which has been done in this field up to recent time and what more advancements can be made into it. The paper also throws light on the different methods which can be used and compares the existing models and frameworks of Agent Based Software Designing.

II. INTRODUCTION

Agent-based system, is one in which the key abstraction used is that of an agent. Agent-based systems may contain a single agent, (as in the case of user interface agents or software secretaries), but arguably the greatest potential lies in the application of multi-agent systems. By an agent, we mean a system that enjoys the following

properties namely –autonomy, reactivity, pro-activeness and social ability. Agents are espoused as a new theoretical model of computation that more closely reflects current computing reality. Agent based system is one of a class of computational models for simulating the actions and interactions of autonomous agents (both individual and collective entities such as organizations or groups) with a view to assessing their effects on the system as a whole. Agent-based systems are a promising development for computer science generally. If intelligent agent technology prospers, then it will provide a solution to many important and difficult software problems.

Agent based system finds its application in the fields of Biology, Networks, Economics and social sciences. Most of the agent-based modeling software are designed for serial Von-Neumann computer architecture. This limits the speed and scalability of these systems. A recent development is the use of data-parallel algorithms on Graphics Processing Units.

The idea of agent-based modeling was developed as a relatively simple concept in the late 1940s. Since it required computation-intensive procedures, it did not become widespread until the 1990s. One of the earliest agent-based models in concept was Thomas Schelling's segregation model, which was discussed in his paper "Dynamic Models of Segregation" in 1971.

III. LITERATURE REVIEW

1: Survey On Agent Based Modeling

1.1 Tools of the Trade: A Survey of Various Agent Based Modeling Platforms

Author: Cynthia Nikolai and Gregory Madey (2009)

Published: 31-Mar-2009

Authority Based Modeling (ABM) tool boxes are as different as the gathering of people who use them. With such an assortment of tool boxes available, the choice of which one is most fitting for a wander is left to verbal, past experiences in using particular toolboxes and tool compartment consideration. This is especially troublesome for endeavors that require specialization. Instead of using toolboxes that are the most pitched however are expected for general exercises, using this paper, one will have the ability to pick a tool compartment that starting at now exists and that may be produced especially for one's particular space and focused needs. This paper manages the entire continuum of administrator based toolboxes. It depicts each in light of 5 imperative traits customers consider while picking a tool stash, and after that it sorts the qualities into straightforward logical characterizations that guide in fast requesting and basic reference.

1.2 TITLE: Evaluation complexity problem in agent based software development methodology

AUTHOR: Amin Saremi, Department of Computer Engineering, Sharif University of Technology, Iran
Mostafa Esmaeili, Department of Electrical and Computer Engineering, Shahid Beheshti University, Iran
Mahshid Rahnama, Department of Computer Engineering, Sharif University of Technology, Iran

Date of Conference: 9-11 Aug. 2007

In this paper, they have given an assessment structure of operator arranged techniques. To exhibit the utilization of the recommended system, it was connected to assess two approaches (MESSAGE and Prometheus) utilizing an appropriate illustration. Comes about demonstrate that, utilizing this strategy, techniques can be genuinely thought about and assessed.

1.3 TITLE: Improving the Agent Based Software Development Process.

AUTHOR: PRABHAT RANJAN, Motilal Nehru National Institute of Technology, India

A. K. MISRA, Motilal Nehru National Institute of Technology, India

Date of Conference: 25-31 Aug. 2007

In this paper, they have proposed a model-based method that gives a particular model to the sort of data to be accumulated and utilized this model to drive the space particular investigation handle. In the proposed specialist based framework, the attention is on an unmistakable division between the necessity social occasion and investigation stages. The examination procedure parts the investigation stage into the client driven examination and the framework driven investigation stages.

1.4 A Survey of Agent-Based Modeling Practices (January 1998 to July 2008)

Brian Heath, Raymond Hill and Frank Ciarallo (2009)

In the 1990s, Agent-Based Modeling (ABM) began grabbing pervasiveness and addresses a departure from the more settled reenactment approaches. This flight, its present headway and its extending application by non-customary reenactment disciplines shows the need to

incessantly study the current state of ABM and perceive open entryways for improvement. To begin to satisfy this need, the authors have outlined and assembled data from 279 articles from 92 stand-out dissemination outlets in which the essayists had manufactured and inspected a master based model. From this generous enlightening gathering they set up the present routine of ABM with respect to year of circulation, field of study, entertainment programming used, explanation behind the reenactment, satisfactory endorsement criteria, endorsement frameworks and complete depiction of the generation.

**1.5: Agent-based distributed manufacturing control:
A state-of-the-art survey**

Volume 22, Issue 7, October 2009,

AUTHOR: Paulo Leitão

Creating has gone up against basic changes in the midst of the latest years, particularly the move from an area economy towards a worldwide and centered economy, with business segments asking for exceedingly revamp aftereffects of high gauge at lower costs, and with short life cycles. In these conditions, the present test is to make delivering control systems that show knowledge, power and conformity to the earth changes and unsettling impacts. The introduction of multi-administrator systems and holonic creating structures principles addresses these essentials, bringing the upsides of measured quality, decentralization, autonomy, adaptability and re-convenience. This paper audits the sending in gathering control structures using passed on fake awareness systems, particularly multi-administrator structures and holonic creating systems guidelines. The paper similarly discusses the reasons behind the fragile determination of these strategies by industry and raises

the challenges and research open entryways for what's to come.

1.6: Metrics for agent-based software development

Authors: B.H. Far , Dept. of Electr. & Comput. Eng., Calgary Univ., Alta., Canada

T. Wanyama, Dept. of Electr. & Comput. Eng., Calgary Univ., Alta., Canada

Date: 4-7 May 2003

This exploration paper concentrates on the outline and advancement of multiagent systems(MAS). In any case, administrator structure change is at present administered by easygoing guidelines, heuristics and inspirations rather than formal measures and especially described building techniques. In this paper we describe a game plan of target and subjective estimations to evaluate the multifaceted nature of MAS. The subjective estimations is a modified adjustment of limit point (FP) including the algorithmic unconventionality and data multifaceted nature figure. The objective estimations is a measure for about decomposability, measured by the open connection. Such estimations can be used to pick the best plan for the MAS. A framework for master build programming progression based as for such estimations is proposed.

2: Applications Of Agent Based Software Development

2.1: An agent based intelligent environmental monitoring system.

Authors

Ioannis N. Athanasiadis (Informatics and Telematics Institute, Centre for Research and Technology Hellas, Thessaloniki, Greece)

Pericles A. Mitkas (Department of Electrical and Computer Engineering, Aristotle University of Thessaloniki, Thessaloniki, Greece)

Date: 2003.

Abstract:

Truly quick environmental changes call for constant perception and on-line fundamental initiative. There are two essential zones where IT developments can be productive. In this paper, a multi-agent structure is shown for watching and assessing air-quality qualities, which uses data starting from a meteorological station. A social order of programming administrators is allotted to screen and favor estimations starting from a couple of sensors, to review air-quality, and, finally, to fire cautions to fitting recipients, when required. Data mining frameworks have been used for including data-driven, modified information into administrators.

2.2: Intelligent agent based information warfare advisor (“Bob in a box”)

Author:

Carl Moore (Department of Management Science, George Washington University, Washington, DC, USA)

Seung Baek (Department of Management Science, George Washington University, Washington, DC, USA)

Jay Liebowitz (Department of Management Science, George Washington University, Washington, DC, USA)

LTC Robert Kilmer (Center for Strategic Leadership, Science and Technology Division, US Army War College, Carlisle Barracks, PA, USA)

Robert Minehart (Center for Strategic Leadership, Science and Technology Division, US Army War College, Carlisle Barracks, PA, USA)

Date: 2002

Abstract: This paper gives some foundation on insightful operators and afterward portrays the proposed design for building this savvy agent-based data fighting (IW) consultant (called "Bob-in-a-box" - named after our IW space master, Bob Minehart).

2.3: TITLE: An agent-based software development method for developing an agent-based multimedia system

AUTHOR: Chiung-Hon Leon Lee, Dept. of Electr. Eng., Nat. Chung Chen Univ., Ming-Hsiung, Taiwan

Alan Liu, Dept. of Electr. Eng., Nat. Chung Chen Univ., Ming-Hsiung, Taiwan

Kwan-Yu Chen, Dept. of Electr. Eng., Nat. Chung Chen Univ., Ming-Hsiung, Taiwan

Date of Conference: 10-12 Dec. 2003

In this paper, they have proposed a rapid prototyping approach that combines the component based software engineering (CBSE) and the case-based reasoning (CBR) techniques to facilitate the development of agent-based multimedia software. This approach applies CBR to retrieve existing agent software components from an old agent design case and adapt retrieved components to construct an agent system that fulfills the user's requirements.

2.4: Practical Points for the Software Development of an Agent-Based Model of a Coupled Human-Natural System

Author: Santiago L. Rovere

Date: 18 July 2016

Displaying of complex characteristic and human frameworks to bolster strategy or administration basic leadership is ending up plainly progressively normal. The subsequent models are frequently outlined and executed by specialists or area specialists with constrained programming designing mastery. To help this vital gathering of people, the experience and share lessons gained from the outline and execution of a specialist based model of horticultural generation frameworks in the Argentine Pampas, underscoring the product building point of view are introduced in this paper. The model's outline incorporate the model classes; the action chart, and information stream; the bundle and envelope format; the utilization of configuration examples; execution streamlining; instatement approaches; the investigation of results; and model estimation, approval, and check.

2.5: Towards agent-based software engineering for information-dependent enterprise applications

Author: S.C. Laufmann

Date: 2014

The approach described addresses the distribution and heterogeneity common to this class of application by creating an application-independent software agent kernel and then deploying that kernel in various specific applications according to a practical and incremental strategy.

2.6: Agent-based risk management – a regulatory approach to financial markets

Author: Thomas Theobald (Macroeconomic Policy Institute, Düsseldorf, Germany)

Date: 2015

The purpose of this paper is to provide market risk calculation for an equity-based trading portfolio. Instead of relying on the purely stochastic internal model method which banks currently apply in line with the Basel regulatory requirements, the author also propose including alternative price mechanisms from the financial literature in the regulatory framework. For this purpose, a financial market model with heterogeneous agents is developed, capturing the realistic feature that parts of the investors do not follow the assumption of no arbitrage, but are motivated by behavioral heuristics instead. Although both the standard stochastic and the behavioral model are restricted to a calibration including the last 250 trading days, the latter is able to capitalize possible turbulence on financial markets and likewise the well-known phenomenon of excess volatility – even if the last 250 days reflect a non-turbulent market.

2.7: A Market Collaborative Agents-Based Framework for Information Retrieval

Author: Djamel Eddine Menacer, Nassima Guenaoui

Date: 31 Oct.-4 Nov. 2016

A data recovery handle starts when a client enters a formal articulations of data needs, known as inquiry, into the framework and closures when results are given. Since 10 years, an intrigue was given to programming operators innovation and its applications. Specialists have been effectively utilized as a part of many fields: operators based market frameworks end up being productive for executing web based business or applications on the Internet, because of natural properties, for example, prominence of connections, coordinated effort between operators, self-governance, adaptability, interoperability, and so forth.

In spite of the fact that the utilization of operators in other application areas is not yet broad, the reconciliation of specialists into market components convey clear and productive answers for Quality of Service (QoS) issues experienced in most dispersed applications and prominently in Web IR frameworks

2.8: An agent-based software development method for developing an agent-based multimedia system

Author: Chiung-Hon Leon Lee, Dept. of Electr. Eng., Nat. Chung Chen Univ., Ming-Hsiung, Taiwan

Date: 10-12 Dec. 2003

The outline of an operator based mixed media framework is isolated into the gathering level, specialist level, ability level, module level, and code level. Those levels are sorted out from theoretical (gathering) level to solid (code) level, and various cases in a progressive portrayal are utilized to speak to the outline of an operator framework.

2.9: Agent based architecture for manufacturing system control.

Author:

C.K. Fan (Department of Industrial and Manufacturing Systems Engineering, The University of Hong Kong, Hong Kong)

T.N. Wong (Department of Industrial and Manufacturing Systems Engineering, The University of Hong Kong, Hong Kong)

Date: 1990.

An adaptable assembling framework (FMS) is a mind boggling fabricating framework and it requests a vigorous control programming for its booking, arranging and control capacities. This paper depicts the advancement of an agent-based foundation for the

control of a cell FMS. The FMS in this venture is an adaptable get together cell (FAC), containing two gathering robots and a transport framework. The point is to build up a multi-agent control framework with great expandability and to have the capacity to adapt to element changes in the FAC.

2.10: Strategic scanning and interpretation revisiting: foundations for a software agent support system Part 2: scanning the business environment with software agents

Authors: Shuhua Liu (Åbo Akademi University, DataCity, Turku, Finland)

Date: 1998.

In this paper, a product operator approach been brought into filtering emotionally supportive networks. A review of programming operator essentials is made to comprehend what a specialist is; the thing that it can do and can't do; what are the segments of a specialist; and how a specialist can be developed. At that point its pertinence is inspected in offering dynamic filtering backing to administrators.

3 Simulations of different Agent Based Modeling Systems

3.1: Agent-based modeling and simulation

Authors: Charles M. Maca | Argonne National Laboratory, Argonne, IL Michael J. North | Argonne National Laboratory, Argonne, IL

Specialist based demonstrating and reenactment (ABMS) is another way to deal with displaying frameworks contained self-sufficient, communicating operators. Computational advances have made conceivable a developing number of specialist based models over an assortment of utilization spaces.

Applications extend from demonstrating operator conduct in the share trading system, supply chains, and purchaser markets, to foreseeing the spread of plagues, alleviating the danger of bio-fighting, and comprehension the variables that might be in charge of the fall of antiquated human advancements. Such advance proposes the capability of ABMS to have broad impacts on the way that organizations utilize PCs to bolster basic leadership and analysts utilize operator based models as electronic research centers. Some fight that ABMS "is a third method for doing science" and could enlarge conventional deductive and inductive thinking as disclosure strategies. This concise instructional exercise presents operator based displaying by portraying the establishments of ABMS, talking about some illustrative applications, and tending to toolboxes and techniques for creating specialist based models.

3.2: Agent-based approach for software development process simulation

Authors: N. Bellamine-Ben Saoud, RIADI-GDL Lab. ENSI, Univ. La Manouba, Tunisia

M. Essafi, RIADI-GDL Lab. ENSI, Univ. La Manouba, Tunisia

H. Ben Ghezala, RIADI-GDL Lab. ENSI, Univ. La Manouba, Tunisia

Date: 6-9 Oct. 2002

An operator based test system is planned and created where its principle segments are condition and performing artists: nature which is made out of the guide structure being reenacted and the item being produced; programming specialists are displayed as self-ruling

specialists ready to choose areas and accomplish expectations.

3.3 Supporting agent-based distributed software development through modeling and simulation

Authors: Lie Cai, Inf. Technol., AIU Online, Hoffman Estates, IL, USA, C.K. Chang

Date: 30 May 2003

This research paper shows one arrangement utilizes portable operator based apparatuses to bolster community oriented programming designing errands, for example, necessities administration. Regardless of the way that advancement and approval of such instruments would be encouraged by the utilization of demonstrating and reproduction, next to no work relating formal strategies to specialist based framework improvement has been performed. This paper hence exhibits a various leveled hued Petri Net (CPN) display as a formal structure for operator based appropriated programming advancement, and shows its handiness by applying the structure to the improvement of a prerequisites administration framework.

3.4: An agent-based simulation model of human–environment interactions in agricultural systems

Pepijn Schreinemachers, Thomas Berger

This paper depicts an operator based programming bundle, called Mathematical Programming-based Multi Agent Systems (MP-MAS), which expands on a custom of utilizing obliged enhancement to mimic homestead basic leadership in rural frameworks. The motivation behind MP-MAS is to see how agrarian innovation, advertise progression, natural change, and approach

intercession influence a heterogeneous populace of ranch families and the agro-environmental assets these families summon. The product is exhibited utilizing the Overview, Design ideas, and Details (ODD) convention. Displaying components are shown with exact applications to study locales in Chile, Germany, Ghana, Thailand, Uganda, and Vietnam.

3.5: TITLE: Supporting agent-based distributed software development through modeling and simulation.

AUTHOR: Lie Cai, Inf. Technol., AIU Online, Hoffman Estates, IL, USA

C.K. Chang

J. Cleland-Huang

Date of Conference: 30-30 May 2003

This paper presents a hierarchical colored Petri Net (CPN) model as a formal framework for agent-based distributed software development, and demonstrates its usefulness by applying the framework to the development of a requirements management system.

3.6: TITLE: Agent-based simulation of the software development process: A case study at AVL

AUTHOR:

Bojan Spasic, AVL-AST Ltd. Av. Dubrovnik 10 Zagreb, Croatia

Bhakti S. S. Onggo, Department of Management Science, Lancaster University Management School, Lancaster, United Kingdom

Date of Conference: 9-12 Dec. 2012

This paper bolsters the utilization of ABS in SPSM. The other commitment of this paper is to exhibit how the ABS model can be created, adjusted and approved utilizing information promptly accessible to numerous

product improvement organizations/offices. This paper concentrates on the development period of a custom-made Rational Unified Process utilized as a part of a topographically disseminated programming advancement division at AVL. The outcomes look encouraging yet more work should be done to incorporate ABS into one of the standard reproduction ideal models in SPSM.

3.7: Developing service supply chains by using agent based simulation

Author: Javad Rouzafzoon (Department of Production, University of Vaasa, Vaasa, Finland)

Petri Helo (Department of Production, University of Vaasa, Vaasa, Finland)

Date: 2016

The purpose of this paper is to demonstrate by using an example how agent-based modeling can be used for health service supply chain design. Generic structure of agent-based service supply chain modeling is described. The presented example is healthcare supply chain with service distribution and service location problem. Main focus in presentation on model building, actual case data are not discussed. In context of service supply chain, agent-based modeling has advantages compared to traditional discrete event approach. Agent-based simulation allows modeling of interactions of autonomous agents.

3.8: Agent-based simulation of the software development process: A case study at AVL

Authors:

Bojan Spasic, AVL-AST Ltd. Av. Dubrovnik 10 Zagreb, Croatia

Bhakti S. S. Onggo, Department of Management Science,
Lancaster University Management School, Lancaster,
United Kingdom

Date: 9-12 Dec. 2012

This paper concentrates on the development period of a custom fitted Rational Unified Process utilized as a part of a geologically dispersed programming advancement division at AVL. The outcomes look encouraging yet more work should be done to incorporate ABS into one of the standard reenactment ideal models in SPSM. A pragmatic exertion capacity to gauge designers' conduct has been proposed. The other commitment of this paper is to exhibit how the ABS model can be produced, aligned and approved utilizing information promptly accessible to numerous product advancement organizations/offices.

4: Multi Agent Based Modeling

4.1 A multi-agent based system with big data processing for enhanced supply chain agility

Authors: Mihalis Giannakis, (Audencia Business School, Nantes, France) Michalis Louis, (University College Dublin, Dublin, Ireland)

Date: 2015

The motivation behind this paper is to build up a multi-specialist based inventory network administration framework that joins huge information examination that can apply self-ruling restorative control activities. The impacts of the framework on production network deftness are investigated. For the advancement of the engineering of the framework, a successive approach is received. Initial three crucial measurements of store network nimbleness are distinguished – responsiveness, adaptability and speed. At that point the hierarchical

outline of the framework is produced. The parts for each of the specialists inside the system are characterized and the collaborations among these operators are demonstrated. Utilizations of the model are examined, to show how the proposed model can possibly give upgraded levels in each of the measurements of production network deftness.

4.2: Multi-agent systems in a distributed smart grid: Design and implementation

M. Pipattanasomporn

Virginia Tech - Advanced Research Institute,
Arlington, 22203 USA

H. Feroze

S. Rahman

Virginia Tech - Advanced Research Institute,
Arlington, 22203 USA

The goal of this paper is to talk about the plan and execution of a multi-operator framework that gives insight to an appropriated shrewd network — a keen matrix situated at a dispersion level. A multi-operator application advancement will be examined that includes specialist detail, application investigation, application outline and application acknowledgment. The message trade in the proposed multi-specialist framework is intended to be perfect with an IP-based system (IP = Internet Protocol) which depends on the IEEE standard on Foundation for Intelligent Physical Agent (FIPA). The paper shows the utilization of multi-operator frameworks to control a dispersed brilliant network in a reproduced situation.

4.3 JADE: A software framework for developing multi-agent applications. Lessons learned

Authors : Fabio Bellifemine, Giovanni Caire, Agostino Poggi, Giovanni Rimassa

Applications extend from demonstrating operator conduct in the share trading system, supply chains, and purchaser markets, to foreseeing the spread of plagues, alleviating the danger of bio-fighting, and comprehension the variables that might be in charge of the fall of antiquated human advancements. Such advance proposes the capability of ABMS to have broad impacts on the way that organizations utilize PCs to bolster basic leadership and analysts utilize operator based models as electronic research centers.

4.4: TITLE: Research of software development methodology based on self-adaptive multi-agent systems

AUTHOR:Kui Che,Department of computer Science and Application, Zhengzhou Institute of Aeronautical Industry Management, 450015, China

Ling-ling Li,Department of computer Science and Application, Zhengzhou Institute of Aeronautical Industry Management, 450015, China

Xiao-tai Niu,Department of computer Science and Application, Zhengzhou Institute of Aeronautical Industry Management, 450015, China

Date of Conference: 14-16 Aug. 2009

This paper discusses the self-adaptive mechanism of self-adaptive multi-Agent systems, the software development process of self-adaptive multi-Agent systems, the modeling method of self-adaptive Agent modeling language and Agent UML. Taking “International Conference Management System” as

a case, and describes the development process of self-adaptive multi-Agent systems.

4.5: A multi-agent based framework for supply chain risk management

Mihalis Giannakis, Michalis Louis

This paper describes the abnormal state of multifaceted nature of supply chains and the inborn dangers that exist in both the request and supply of assets – particularly in monetary downturns – perceived as real constraining components in accomplishing large amounts of production network execution. This paper builds up a structure for the plan of a multi-specialist based choice emotionally supportive network for the administration disturbances and relief of dangers in assembling supply chains.

4.6: Agent-based computing from multi-agent systems to agent-based models: a visual survey

AUTHORS: Muaz Niazi Amir Hussain Published Online: August 05, 2011

This paper utilizes Scientometric investigation to examine all sub-areas of specialist based figuring. In the proposed approach, the authors have utilized a blend of two applications for examination, specifically Network Workbench and CiteSpace—wherein Network Workbench took into account the investigation of complex system parts of the space, definite perception based investigation of the bibliographic information was performed utilizing CiteSpace. Their outcomes incorporate the distinguishing proof of the biggest bunch in light of watchwords, the course of events of production of

record terms, the center diaries and key subject classes.

4.7: Automated verification of AUML based multi-agent system design

Author: SeyedehmehrnazMireslami, Behrouz H. Far

Date: 5-8 May 2013

Industrial demands for agent-based software engineering have significantly increased in the past years. In this paper, Agent UML is employed for designing multi-agent systems. A set of conversion rules is proposed to convert Agent UML methodology into UML sequence diagrams that can be used for behavior model synthesis. Then, an automated tool is developed for multiagent system verification that can replace the existing ad hoc methods. To validate the proposed methods, a case study of a Real-Time Fleet Management System is used.

4.8: Event-based evolution mechanism in dynamic environment for multi-agent system

Author: Qingshan Li, Hua Chu, Liang Diao

Software Engineering Institute, Xidian University, Xi'an 710071, P.R. China

Date: 19-21 Aug. 2014

As Agent-based software development methods get more and more attention and Agent-based software system has been used in a variety of occasions, the features and advantages of Agent have been recognized by scholars. However, the runtime environment of Agent is dynamic, open and changeable; runtime in this kind of environment is a big challenge to ensure that the software system can satisfy the user's requirements and is proper in

continuous running.. By the proposed mechanism, the Agent could autonomously cooperate with others to complete the task. Finally, an experiment of the mechanism was presented to verify its effectiveness.

5 Agent Based Software Development Methodologies

5.1: Title: An Agent-Oriented Software Development Methodology.

AUTHOR:

Paolo Brescian ,ITC-IrstPovo (Trento)Italy

Anna Perini, ITC-IrstPovo (Trento)Italy

Paolo Giorgini, Department of Information and Communication TechnologyUniversity of TrentoItaly

Fausto Giunchiglia, Department of Information and Communication TechnologyUniversity of TrentoItaly

John Mylopoulos, Department of Computer ScienceUniversity of TorontoCanada

Date of Conference: May 2004

This paper is to introduce and motivate a methodology, called Tropos, for building agent oriented software systems. Tropos is based on two key ideas. First, the notion of agent and all related mentalistic notions (for instance goals and plans) are used in all phases of software development, from early analysis down to the actual implementation. Second, Tropos covers also the very early phases of requirements analysis, thus allowing for a deeper understanding of the environment where the software must operate, and of the kind of interactions that should occur between software and human agents. The methodology is illustrated with the help of a case study.

5.2: ASPECS: an agent-oriented software process for engineering complex systems

AUTHORS: Massimo Cossentino Nicolas Gaud
Vincent Hilaire Stéphane Galland
Abderrafiâa Koukam

This paper exhibits an administrator arranged programming process for building complex systems called ASPECS. ASPECS relies on upon a holonic definitive metamodel and gives a very much requested guide from necessities to code allowing the showing of a structure at different levels of purposes of enthusiasm using a plan of refinement strategies. This paper unpretentious components the entire ASPECS headway handle and gives a game plan of methodological standards for every technique activity. An aggregate relevant examination is furthermore used to speak to the diagram technique and the related documentations. ASPECS uses UML as a showing vernacular. In light of the specific needs of administrators and holonic various leveled layout, the UML semantics and documentation are used as reference concentrates, be that as it may they have been extended by introducing new specific profiles.

5.3: An ontology-based agent for context aware software process development

Authors: Josivan Pereira de Souza , Cesar Augusto Tacla, Franciele Beal, Emerson Cabrera Paraiso, Gustavo A. Giménez-Lugo
UTFPR - Federal University of Technology - Paraná, Curitiba, Brazil

Date: 27-29 June 2013

In this paper, an ongoing project automatically, recognizes the activities performed by developers during their daily work has been presented. Recognizing those

activities might facilitate the execution of the same activities in the near future. Researching in CSCW for small team has been done for the last years. Small software development teams have special needs and requirements that must be taken into account when designing tools for supporting cooperation of their participants. The architecture of a system (called CSCW-SD) to support small collocated teams developing software.

5.4: TITLE: Extending the Gaia Methodology for the Design and Development of Agent-based Software Systems

AUTHOR: Wei Huang, University of Westminster
Elia El-Darzi, University of Westminster
Li Jin, University of Westminster

Date of Conference: 24-27 July 2007

In this paper, the participant researchers in Health Care Computing Group at University of Westminster concentrate on the agent-oriented methodology for the analysis and design of agent-based systems and identify how methodology can support both the levels of "agent structure" and of "agent society" in the agent-oriented software design and development process. The research reported here takes one leading agent-oriented methodology-Gaia, and then extended it by the creation of innovative design tools which aimed at better supporting application to real-world domains.

5.5: TITLE: An integrated software development environment with XML internal representation

AUTHOR: Chih-Hung Chang, Dept. of Inf. Eng., Feng Chia Univ., Taichung, Taiwan
W.C. Chu, Chih-Wei Lu

Date of Conference: 28-30 Sept. 2004

In this paper they have discussed some techniques on how we can improve the PIE approach and propose an XML-based meta-model for process and agent-based integrated software development environment (PRAISE). PRAISE includes both the external representation in UML and its internal representation in XML, and can be used to support the integration of software development in a global aspect.

5.6: TITLE: A Structured Data Object Based, Agent Component Oriented Approach to Software Development

AUTHOR: You-Tian Qu, College of Information Science and engineering, Zhejiang Normal University, Jinhua, 321004, China; Bin-Yao Jin Hong Xu

Date of Conference: 18-21 Aug. 2005

Using software agents as next generation flexible components and applying reuse technologies to rapidly construct agents and agent systems have great promise to improve application and system construction. First, a principle and method structured data object based for simplifying the complex information system development and evolution is discussed, and a structured object-based agent component framework is proposed. Second, one of the implementation details about a structured object-based agent component is discussed. Finally, an application instance developed by this method is introduced.

5.7: A Development System for Intelligent Agent Manufacturing Software:

Authors:

A.D. Kwok (Research Associate of the Division of

Manufacturing Engineering, The University of Calgary, Alberta, Canada.)

Douglas H. Norrie (is Head of the Division of Manufacturing Engineering, The University of Calgary, Alberta, Canada.)

Date: 1994

The smart specialist protest (IAO) framework is a multi paradigm advancement condition which can be utilized to make insightful operator frameworks for assembling or different spaces. The IAO framework was created from the rule based protest (RBO) framework which is a programming situation incorporating both the rule based and object oriented ideal models. Propagation oriented programming, access oriented programming and group oriented writing computer programs are among the expansions incorporated into the IAO framework. Its most strange commitment is the propagation oriented programming worldview which is not found in many frameworks.

5.8: Ontology development for agent-based collaborative design

Authors: O. O. UGWU, C. J. ANUMBA & A. THORPE

Date: 2001

The smart specialist protest (IAO) framework is a multi paradigm advancement condition which can be utilized to make insightful operator frameworks for assembling or different spaces. The IAO framework was created from the rule based protest (RBO) framework which is a programming situation incorporating both the rule based and object oriented ideal models. Propagation oriented programming, access oriented programming and group oriented writing computer programs are among the

expansions incorporated into the IAO framework. Its most strange commitment is the propagation oriented programming worldview which is not found in many frameworks.

IV. CONCLUSION

Agent based software systems are a promising advancement, not only for artificial intelligence, but rather for software engineering for the most part. On the off chance that artificial agents innovation progresses, then it will give an answer for some essential yet difficult programming issues. The test now before the agent based software developers is to guarantee that the systems grow smoothly from the work done especially over the previous decade for building the software's to reality and using it in daily life. Software engineering for agent systems is at an early stage of development, and it implies that agents have a significant future in software engineering with the widespread acknowledgement of the concept of an agent. This is in no way, shape or form simple, as the master frameworks encounter illustrates.

We have examined the various fundamental problems from the point of view of agent-based systems. We have also analysed the advancements which have been made till date and what more is possible. Throughout, we have been careful to draw as many parallels as possible with more mainstream software engineering.