



## 教育部科技查新工作站（南京大学） 文献检索报告

本部于 2025 年 01 月 20 日受理南京大学 魏恒峰 的委托，检索其送检的 16 篇研究论文被 SCIE、CPCI-S、EI 收录，被 WOS 核心合集引用及期刊影响因子、分区的情况。

检索类别： 收录、引用、期刊影响因子、分区

检索方式： 机检

检索范围： 国内、国外

检索工具：

SCIE (SCIEXPANDED-1900-至今)

CPCI-S (Conference Proceedings Citation Index - Science 1900-至今)

Web of Science 核心合集

EI (Ei Compendex Web 1969-至今)

Journal of Citation Index (1997~2023)

检索时限： 2012-至今

检索结果：

魏恒峰的论文被 SCIE 收录 6 篇；

魏恒峰的论文被 CPCI-S 收录 5 篇；

魏恒峰的论文被 EI 收录 16 篇；

魏恒峰的论文被 WOS 核心合集引用 54 篇次（其中他引 46 篇次）。

检索结果附后。

他引的定义是：除被检索作者以外其他的人引用。

教育部科技查新工作站（南京大学）

2025 年 01 月 20 日

报告编号：25-0027



## 教育部科技查新工作站（南京大学） 文献检索报告

本部于 2025 年 01 月 20 日受理**南京大学 魏恒峰**的委托，检索其送检的 **16 篇** 研究论文被 SCIE、CPCI-S、EI 收录，被 WOS 核心合集引用及期刊影响因子、分区的情况。

检索类别： 收录、引用、期刊影响因子、分区

检索方式： 机检

检索范围： 国内、国外

检索工具：

SCIE（SCIEXPANDED-1900-至今）

CPCI-S（Conference Proceedings Citation Index - Science 1900-至今）

Web of Science 核心合集

EI（Ei Compendex Web 1969-至今）

Journal of Citation Index（1997~2023）

检索时限： 2012-至今

检索结果：

**魏恒峰**的论文被 **SCIE** 收录 **6 篇**；

**魏恒峰**的论文被 **CPCI-S** 收录 **5 篇**；

**魏恒峰**的论文被 **EI** 收录 **16 篇**；

**魏恒峰**的论文被 **WOS 核心合集**引用 **54 篇次**（其中他引 **46 篇次**）。

检索结果附后。

他引的定义是：除被检索作者以外其他的人引用。

教育部科技查新工作站（南京大学）

2025 年 01 月 20 日

一、 魏恒峰的发表期刊影响因子分区情况

序号	篇名	刊名	影响因子
1	IsoVista: Black-box Checking Database Isolation Guarantees	PROCEEDINGS OF THE VLDB ENDOWMENT	2.6(2023)
	类别		分区
	COMPUTER SCIENCE, THEORY & METHODS(SCIE)		Q2
	COMPUTER SCIENCE, INFORMATION SYSTEMS(SCIE)		Q2
2	Efficient Black-box Checking of Snapshot Isolation in Databases	PROCEEDINGS OF THE VLDB ENDOWMENT	2.6(2023)
	类别		分区
	COMPUTER SCIENCE, THEORY & METHODS(SCIE)		Q2
	COMPUTER SCIENCE, INFORMATION SYSTEMS(SCIE)		Q2
3	Checking Causal Consistency of MongoDB	JOURNAL OF COMPUTER SCIENCE AND TECHNOLOGY	0.7(2022)
	类别		分区
	COMPUTER SCIENCE, ARTIFICIAL INTELLIGENCE(ESCI)		
	COMPUTER SCIENCE, SOFTWARE ENGINEERING(SCIE)		Q3
	COMPUTER SCIENCE, HARDWARE & ARCHITECTURE(SCIE)		Q3
4	Jupiter Made Abstract, and Then Refined	JOURNAL OF COMPUTER SCIENCE AND TECHNOLOGY	1.571(2020)
	类别		分区
	COMPUTER SCIENCE, SOFTWARE ENGINEERING(SCIE)		Q3
	COMPUTER SCIENCE, HARDWARE & ARCHITECTURE(SCIE)		Q3
5	Probabilistically-Atomic 2-Atomicity: Enabling Almost Strong Consistency in Distributed Storage Systems	IEEE TRANSACTIONS ON COMPUTERS	3.052(2017)
	类别		分区
	ENGINEERING, ELECTRICAL & ELECTRONIC(SCIE)		Q1
	COMPUTER SCIENCE, HARDWARE & ARCHITECTURE(SCIE)		Q1
6	Verifying Pipelined-RAM Consistency over Read/Write Traces of Data Replicas	IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS	4.181(2016)
	类别		分区
	ENGINEERING, ELECTRICAL & ELECTRONIC(SCIE)		Q1
	COMPUTER SCIENCE, THEORY & METHODS(SCIE)		Q1

二、 WOS 核心合集引用次数统计表

序号	题名	论文出处	实际被引	他引次数
1.	IsoVista: Black-box Checking Database Isolation Guarantees	PROCEEDINGS OF THE VLDB ENDOWMENT;17(12):4325-43282024	0	0

2.	Efficient Black-box Checking of Snapshot Isolation in Databases	PROCEEDINGS OF THE VLDB ENDOWMENT;16(6):1264-12762023	4	2
3.	Checking Causal Consistency of MongoDB	JOURNAL OF COMPUTER SCIENCE AND TECHNOLOGY;37(1):128-1462022	0	0
4.	UNISTORE: A fault-tolerant marriage of causal and strong consistency	PROCEEDINGS OF THE 2021 USENIX ANNUAL TECHNICAL CONFERENCE:923-9372021	3	3
5.	A Generic Specification Framework for Weakly Consistent Replicated Data Types	2020 INTERNATIONAL SYMPOSIUM ON RELIABLE DISTRIBUTED SYSTEMS (SRDS 2020):143-1542020	1	0
6.	Jupiter Made Abstract, and Then Refined	JOURNAL OF COMPUTER SCIENCE AND TECHNOLOGY;35(6):1343-13642020	1	0
7.	Parameterized and Runtime-tunable Snapshot Isolation in Distributed Transactional Key-value Stores	2017 IEEE 36TH INTERNATIONAL SYMPOSIUM ON RELIABLE DISTRIBUTED SYSTEMS (SRDS):21-332017	18	18
8.	Probabilistically-Atomic 2-Atomicity: Enabling Almost Strong Consistency in Distributed Storage Systems	IEEE TRANSACTIONS ON COMPUTERS;66(3):502-5142017	3	2
9.	Verifying Pipelined-RAM Consistency over Read/Write Traces of Data Replicas	IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS;27(5):1511-15232016	4	1
10.	Formal Specification and Runtime Detection of Temporal Properties for Asynchronous Context	2012 IEEE INTERNATIONAL CONFERENCE ON PERVASIVE COMPUTING AND COMMUNICATIONS (PERCOM):30-382012	20	20
合计			54	46

### 三、 魏恒峰的研究论文被 SCIE 收录情况

#### 第 1 条，共 6 条

文献标题:IsoVista: Black-box Checking Database Isolation Guarantees

作者 :Gu, L (Gu, Long);Liu, S (Liu, Si);Xing, TC (Xing, Tiancheng);Wei, HF (Wei, Hengfeng);Chen, YX (Chen, Yuxing);Basin, D (Basin, David)

出版物名称:PROCEEDINGS OF THE VLDB ENDOWMENT 出版年:AUG 2024 卷:17 期:12 页数:4325-4328 DOI:10.14778/3685800.3685866

入藏号:WOS:001378223700018

地址: [Gu, Long; Xing, Tiancheng; Wei, Hengfeng] Nanjing Univ, State Key Lab Novel Software Technol, Nanjing, Peoples R China;[Liu, Si; Basin, David] Swiss Fed Inst Technol, Zurich, Switzerland;[Chen, Yuxing] Tencent Inc, Guangzhou, Peoples R China

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国际标准期刊号 (ISSN):2150-8097

## 第 2 条, 共 6 条

文献标题:Efficient Black-box Checking of Snapshot Isolation in Databases

作者:Huang, KL (Huang, Kaile);Liu, S (Liu, Si);Chen, ZG (Chen, Zhenge);Wei, HF (Wei, Hengfeng);Basin, D (Basin, David);Li, HX (Li, Haixiang);Pan, AQ (Pan, Anqun)

出版物名称:PROCEEDINGS OF THE VLDB ENDOWMENT 出版年:FEB 2023 卷:16 期:6 页数:1264-1276 DOI:10.14778/3583140.3583145

入藏号:WOS:000992408800006

地址: [Huang, Kaile; Chen, Zhenge; Wei, Hengfeng] Nanjing Univ, State Key Lab Novel Software Technol, Nanjing, Peoples R China;[Liu, Si; Basin, David] Swiss Fed Inst Technol, Zurich, Switzerland;[Li, Haixiang; Pan, Anqun] Tencent Inc, Shenzhen, Peoples R China;[Wei, Hengfeng] Nanjing Univ, Software Inst, Nanjing, Peoples R China

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国际标准期刊号 (ISSN):2150-8097

## 第 3 条, 共 6 条

文献标题:Checking Causal Consistency of MongoDB

作者:Ouyang, HR (Ouyang, Hong-Rong);Wei, HF (Wei, Heng-Feng);Li, HX (Li, Hai-Xiang);Pan, AQ (Pan, An-Qun);Huang, Y (Huang, Yu)

出版物名称:JOURNAL OF COMPUTER SCIENCE AND TECHNOLOGY 出版年:FEB 2022 卷:37 期:1 页数:128-146 DOI:10.1007/s11390-021-1662-8

入藏号:WOS:000757837300008

地址: [Ouyang, Hong-Rong; Wei, Heng-Feng; Huang, Yu] Nanjing Univ, State Key Lab Novel Software Technol, Nanjing 210023, Peoples R China;[Wei, Heng-Feng] Nanjing Univ, Software Inst, Nanjing 210093, Peoples R China;[Li, Hai-Xiang; Pan, An-Qun] Tencent Inc, Tencent Distributed SQL Team Technol & Engn Grp T, Shenzhen 518054, Peoples R China

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国际标准期刊号 (ISSN):1000-9000

## 第 4 条, 共 6 条

文献标题:Jupiter Made Abstract, and Then Refined

作者:Wei, HF (Wei, Heng-Feng);Tang, RZ (Tang, Rui-Ze);Huang, Y (Huang, Yu);Lv, J (Lv, Jian)

出版物名称:JOURNAL OF COMPUTER SCIENCE AND TECHNOLOGY 出版年:NOV 2020 卷:35 期:6 页数:1343-1364 DOI:10.1007/s11390-020-0516-0

入藏号:WOS:000596524900008

地址: [Wei, Heng-Feng; Tang, Rui-Ze; Huang, Yu; Lv, Jian] Nanjing Univ, State Key Lab Novel Software Technol, Nanjing 210023, Peoples R China

通讯作者地址: [Huang, Yu] (corresponding author), Nanjing Univ, State Key Lab Novel Software Technol, Nanjing 210023, Peoples R China

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国际标准期刊号 (ISSN):1000-9000

#### 第 5 条, 共 6 条

文献标题: Probabilistically-Atomic 2-Atomicity: Enabling Almost Strong Consistency in Distributed Storage Systems

作者: Wei, HF (Wei, Hengfeng); Huang, Y (Huang, Yu); Lu, J (Lu, Jian)

出版物名称: IEEE TRANSACTIONS ON COMPUTERS 出版年: MAR 1 2017 卷: 66 期: 3

页数: 502-514 DOI: 10.1109/TC.2016.2601322

入藏号: WOS:000395629500010

地址: [Wei, Hengfeng; Huang, Yu; Lu, Jian] Nanjing Univ, State Key Lab Novel Software Technol, Nanjing 210023, Jiangsu, Peoples R China

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国际标准期刊号 (ISSN): 0018-9340

#### 第 6 条, 共 6 条

文献标题: Verifying Pipelined-RAM Consistency over Read/Write Traces of Data Replicas

作者: Wei, HF (Wei, Hengfeng); De Biasi, M (De Biasi, Marzio); Huang, Y (Huang, Yu); Cao, JN (Cao, Jiannong); Lu, J (Lu, Jian)

出版物名称: IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS 出版年: MAY 2016 卷: 27 期: 5 页数: 1511-1523 DOI: 10.1109/TPDS.2015.2453985

入藏号: WOS:000374238100021

地址: [Wei, Hengfeng; Huang, Yu; Lu, Jian] Nanjing Univ, State Key Lab Novel Software Technol, Nanjing 210008, Jiangsu, Peoples R China; [De Biasi, Marzio] Puzzles & Machines Org, Computat Complex, Milan, Italy; [Cao, Jiannong] Hong Kong Polytech Univ, Hong Kong, Hong Kong, Peoples R China

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[Cao, Jiannong] (corresponding author), Hong Kong Polytech Univ, Hong Kong, Hong Kong, Peoples R China

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国际标准期刊号 (ISSN): 1045-9219

### 四、魏恒峰的研究论文被 CPCI-S 收录情况

#### 第 1 条, 共 5 条

文献标题: Efficient Black-box Checking of Snapshot Isolation in Databases

作者:Huang, KL (Huang, Kaile);Liu, S (Liu, Si);Chen, ZG (Chen, Zhenge);Wei, HF (Wei, Hengfeng);Basin, D (Basin, David);Li, HX (Li, Haixiang);Pan, AQ (Pan, Anqun)  
出版物名称:PROCEEDINGS OF THE VLDB ENDOWMENT 出版年:FEB 2023 卷:16  
期:6 页数:1264-1276 DOI:10.14778/3583140.3583145  
入藏号:WOS:000992408800006  
地址: [Huang, Kaile; Chen, Zhenge; Wei, Hengfeng] Nanjing Univ, State Key Lab Novel Software Technol, Nanjing, Peoples R China;[Liu, Si; Basin, David] Swiss Fed Inst Technol, Zurich, Switzerland;[Li, Haixiang; Pan, Anqun] Tencent Inc, Shenzhen, Peoples R China;[Wei, Hengfeng] Nanjing Univ, Software Inst, Nanjing, Peoples R China  
通讯作者地址: [Wei, Hengfeng] (corresponding author), Nanjing Univ, State Key Lab Novel Software Technol, Nanjing, Peoples R China  
电子邮件地址: dg21330016@smail.nju.edu.cn  
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国际标准期刊号 (ISSN):2150-8097

## 第 2 条, 共 5 条

文献标题:UNISTORE: A fault-tolerant marriage of causal and strong consistency  
作者 :Bravo, M (Bravo, Manuel);Gotsman, A (Gotsman, Alexey);de Régil, B (de Régil, Borja);Wei, HF (Wei, Hengfeng)  
出版物名称:PROCEEDINGS OF THE 2021 USENIX ANNUAL TECHNICAL CONFERENCE  
出版年:2021 页数:923-937  
入藏号:WOS:000696708600061  
地址: [Bravo, Manuel; Gotsman, Alexey; de Régil, Borja] IMDEA Software Inst, Madrid, Spain;[Wei, Hengfeng] Nanjing Univ, Nanjing, Jiangsu, Peoples R China;[Wei, Hengfeng] Software Inst, State Key Lab Novel Software Technol, Nanjing, Jiangsu, Peoples R China  
通讯作者地址: [Bravo, Manuel] (corresponding author), IMDEA Software Inst, Madrid, Spain  
电子邮件地址:

## 第 3 条, 共 5 条

文献标题:A Generic Specification Framework for Weakly Consistent Replicated Data Types  
作者:Jiang, X (Jiang, Xue);Wei, HF (Wei, Hengfeng);Huang, Y (Huang, Yu)  
出版物名称 :2020 INTERNATIONAL SYMPOSIUM ON RELIABLE DISTRIBUTED SYSTEMS (SRDS 2020) 出版年 :2020 页 数 :143-154  
DOI:10.1109/SRDS51746.2020.00022  
入藏号:WOS:000646196200015  
地址: [Jiang, Xue; Wei, Hengfeng; Huang, Yu] Nanjing Univ, State Key Lab Novel Software Technol, Nanjing, Peoples R China  
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国际标准期刊号 (ISSN):1060-9857

## 第 4 条, 共 5 条

文献标题:Parameterized and Runtime-tunable Snapshot Isolation in Distributed Transactional Key-value Stores  
作者:Wei, HF (Wei, Hengfeng);Huang, Y (Huang, Yu);Lu, J (Lu, Jian)



出版物名称:2017 IEEE 36TH INTERNATIONAL SYMPOSIUM ON RELIABLE  
DISTRIBUTED SYSTEMS (SRDS) 出版年:2017 页数:21-33  
DOI:10.1109/SRDS.2017.11  
入藏号:WOS:000425924600003  
地址:[Wei, Hengfeng; Huang, Yu; Lu, Jian] Nanjing Univ, State Key Lab Novel Software  
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通讯作者地址:[Wei, Hengfeng] (corresponding author), Nanjing Univ, State Key Lab Novel  
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国际标准期刊号 (ISSN):1060-9857

## 第 5 条, 共 5 条

文献标题:Formal Specification and Runtime Detection of Temporal Properties for Asynchronous  
Context  
作者:Wei, HF (Wei, Hengfeng);Huang, Y (Huang, Yu);Cao, JN (Cao, Jiannong);Ma, XX (Ma,  
Xiaoxing);Lu, J (Lu, Jian)  
出版物名称:2012 IEEE INTERNATIONAL CONFERENCE ON PERVASIVE COMPUTING  
AND COMMUNICATIONS (PERCOM) 出版年:2012 页数:30-38  
入藏号:WOS:000309103700005  
地址:[Wei, Hengfeng; Huang, Yu; Ma, Xiaoxing; Lu, Jian] Nanjing Univ, State Key Lab Novel  
Software Technol, Nanjing 210093, Jiangsu, Peoples R China;[Wei, Hengfeng; Huang, Yu; Ma,  
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## 五、魏恒峰的论文被 EI 收录的情况

<RECORD 1>

Accession number: 20245117564309

Title:LLM Meets Bounded Model Checking: Neuro-symbolic Loop Invariant Inference

Authors: Wu, Guangyuan (1);Cao, Weining (1);Yao, Yuan (1);Wei, Hengfeng (1);Chen, Taolue  
(2);Ma, Xiaoxing (1)

Author affiliation: (1) State Key Laboratory for Novel Software Technology, Nanjing University,  
China; (2) School of Computing and Mathematical Sciences, Birkbeck, University of London,  
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Corresponding author: Yao, Yuan(y.yao@nju.edu.cn); Wu,  
Guangyuan(guangyuanwu@smail.nju.edu.cn)

Source title: Proceedings - 2024 39th ACM/IEEE International Conference on Automated  
Software Engineering, ASE 2024

Abbreviated source title:Proc. - ACM/IEEE Int. Conf. Autom. Softw. Eng., ASE

Issue title: Proceedings - 2024 39th ACM/IEEE International Conference on Automated Software  
Engineering, ASE 2024

Issue date: October 27, 2024

Publication Year: 2024

Pages: 406-417

Language: English

ISBN-13:9798400712487

Document type:Conference article (CA)

Conference name:39th ACM/IEEE International Conference on Automated Software Engineering, ASE 2024

Conference date:October 28, 2024 - November 1, 2024

Conference location:Sacramento, CA, United states

Conference code:204421

Publisher:Association for Computing Machinery, Inc

Abstract:Loop invariant inference, a key component in program verification, is a challenging task due to the inherent undecidability and complex loop behaviors in practice. Recently, machine learning based techniques have demonstrated impressive performance in generating loop invariants automatically. However, these methods highly rely on the labeled training data, and are intrinsically random and uncertain, leading to unstable performance. In this paper, we investigate a synergy of large language models (LLMs) and bounded model checking (BMC) to address these issues. The key observation is that, although LLMs may not be able to return the correct loop invariant in one response, they usually can provide all individual predicates of the correct loop invariant in multiple responses. To this end, we propose a "query-filter-reassemble" strategy, namely, we first leverage the language generation power of LLMs to produce a set of candidate invariants, where training data is not needed. Then, we employ BMC to identify valid predicates from these candidate invariants, which are assembled to produce new candidate invariants and checked by off-the-shelf SMT solvers. The feedback is incorporated into the prompt for the next round of LLM querying. We expand the existing benchmark of 133 programs to 316 programs, providing a more comprehensive testing ground. Experimental results demonstrate that our approach significantly outperforms the state-of-the-art techniques, successfully generating 309 loop invariants out of 316 cases, whereas the existing baseline methods are only able to tackle 219 programs at best. The code is publicly available at <https://github.com/SoftWiser-group/LaM4Inv.git>. © 2024 Copyright is held by the owner/author(s). Publication rights licensed to ACM.

Number of references:55

Controlled terms:['Inference engines', 'Learning systems', 'Model checking', 'Query languages', 'Software testing', 'Structured Query Language']

Uncontrolled terms:['Bounded model checking', 'Labeled training data', 'Language model', 'Large language model', 'Loop invariants', 'Machine-learning', 'Multiple response', 'Performance', 'Program Verification', 'Undecidability']

Classification code:['1101.1 ', '1101.2 ', '1102.1 ', '1106.1.1 ', '1106.4 ', '1106.9 ']

DOI:10.1145/3691620.3695014

Funding Text:This work is supported by the National Natural Science Foundation of China (Grant #62025202), the Fundamental Research Funds for the Central Universities of China (Grant No.020214380102), and the Collaborative Innovation Center of Novel Software Technology and Industrialization. T. Chen is partially supported by oversea grants from the State Key Laboratory of Novel Software Technology, Nanjing University under Grant #KFKT2022A03 and #KFKT2023A04.

Compendex references:YES

Database: Compendex

Data Provider:Engineering Village

Compilation and indexing terms, © 2023 Elsevier Inc.

Classification code:443 Meteorology - 443.1 Atmospheric Properties - 483.1 Soils and Soil Mechanics - 922.2 Mathematical Statistics

Article number:133976

<RECORD 2>

Accession number: 20244317248494

Title:Plume: Efficient and Complete Black-Box Checking of Weak Isolation Levels

Authors: Liu, Si (1);Gu, Long (2);Wei, Hengfeng (2);Basin, David (1)

Author affiliation: (1) Eth Zurich, Zurich, Switzerland; (2) State Key Laboratory for Novel Software Technology, Nanjing University, China

Corresponding author: Wei, Hengfeng(hfwei@nju.edu.cn)

Source title: Proceedings of the ACM on Programming Languages  
Abbreviated source title: Proc. ACM Program. Lang.  
Volume: 8  
Issue: OOPSLA2  
Issue date: October 8, 2024  
Publication Year: 2024  
Language: English  
Document type: Journal article (JA)  
Publisher: Association for Computing Machinery  
Abstract: Modern databases embrace weak isolation levels to cater for highly available transactions. However, weak isolation bugs have recently manifested in many production databases. This raises the concern of whether database implementations actually deliver their promised isolation guarantees in practice. In this paper we present Plume, the first efficient, complete, black-box checker for weak isolation levels. Plume builds on modular, fine-grained, transactional anomalous patterns, with which we establish sound and complete characterizations of representative weak isolation levels, including read committed, read atomicity, and transactional causal consistency. Plume leverages a novel combination of two techniques, vectors and tree clocks, to accelerate isolation checking. Our extensive assessment shows that Plume can reproduce all known violations in a large collection of anomalous database execution histories, detect new isolation bugs in three production databases along with informative counterexamples, find more weak isolation anomalies than the state-of-the-art checkers, and efficiently validate isolation guarantees under a wide variety of workloads. © 2024 Owner/Author.  
Number of references: 67  
Main heading: Black-box testing  
Controlled terms: ['Database systems', 'Formal specification']  
Uncontrolled terms: ['Black boxes', 'Execution history', 'Fine grained', 'Isolation level', 'Modulars', 'Sound and complete', 'State of the art', 'Weak isolation level']  
Classification code: ['1106.4', '1106.5']  
DOI: 10.1145/3689742  
Funding Text: We appreciate the anonymous reviewers for their valuable feedback. We also extend our thanks to Zihe Song for her contribution in identifying isolation bugs in MariaDB-Galera. Si Liu was supported by an ETH Zurich Career Seed Award.  
Compendex references: YES  
Database: Compendex  
Data Provider: Engineering Village  
Compilation and indexing terms, © 2023 Elsevier Inc.  
Classification code: 443 Meteorology - 443.1 Atmospheric Properties - 483.1 Soils and Soil Mechanics - 922.2 Mathematical Statistics  
Article number: 133976

<RECORD 3>

Accession number: 20244017138642  
Title: IsoVista: Black-box Checking Database Isolation Guarantees  
Authors: Gu, Long (1); Liu, Si (2); Xing, Tiancheng (1); Wei, Hengfeng (1); Chen, Yuxing (3); Basin, David (2)  
Author affiliation: (1) State Key Laboratory for Novel Software Technology, Nanjing University, China; (2) ETH Zurich, Switzerland; (3) Tencent Inc, China  
Source title: Proceedings of the VLDB Endowment  
Abbreviated source title: Proc. VLDB Endow.  
Volume: 17  
Issue: 12  
Issue date: 2024  
Publication Year: 2024  
Pages: 4325-4328  
Language: English  
Document type: Conference article (CA)  
Conference name: 50th International Conference on Very Large Data Bases, VLDB 2024

Conference date:August 24, 2024 - August 29, 2024

Conference location:Guangzhou, China

Conference code:306059

Publisher:VLDB Endowment

Abstract:Transactional isolation is critical to the functional correctness of database management systems (DBMSs). Much effort has recently been devoted to finding isolation bugs and validating isolation fulfilment in production DBMSs. However, there are still challenges that existing isolation checkers have not yet fully addressed. For instance, they may overlook bugs, incur high checking overhead, and return hard-to-understand counterexamples. We present IsoVista, the first black-box isolation checking system that encompasses all the following features. It builds on faithful characterizations of a range of isolation levels, ensuring the absence of both false positives and missed bugs in collected DBMS execution histories. IsoVista exhibits superior checking efficiency, compared to the state-of-the-art, and visualizes violation scenarios, facilitating the understanding of bugs found. It also supports profiling and benchmarking the performance of isolation checkers under various workloads, assisting developers of both DBMSs and checkers. We showcase all these features through user-friendly interfaces. © 2024, VLDB Endowment. All rights reserved.

Number of references:9

Main heading:User interfaces

Controlled terms:['Benchmarking', 'Black-box testing', 'Database systems']

Uncontrolled terms:['Black boxes', 'Checking efficiency', 'Database management', 'Execution history', 'False positive', 'Functional correctness', 'Isolation level', 'Management systems', 'Performance', 'State of the art']

Classification code:['1103.2 ', '1106.4 ', '1106.5 ', '913.3 Quality Assurance and Control']

DOI:10.14778/3685800.3685866

Funding Text:Si Liu was supported by an ETH Zurich Career Seed Award.

Compendex references:YES

Database: Compendex

Data Provider:Engineering Village

Compilation and indexing terms, © 2023 Elsevier Inc.

Classification code:443 Meteorology - 443.1 Atmospheric Properties - 483.1 Soils and Soil Mechanics - 922.2 Mathematical Statistics

Article number:133976

<RECORD 4>

Accession number: 20231713944672

Title:Efficient Black-box Checking of Snapshot Isolation in Databases

Authors: Huang, Kaile (1);Wei, Hengfeng (1);Liu Si.Liu@Inf.Ethz.Ch, Si (2);Basin, David (2);Pan, Anqun (3);Chen, Zhenge (1);Li, Haixiang (3)

Author affiliation: (1) State Key Laboratory for Novel Software Technology Nanjing University, China; (2) ETH Zurich, Switzerland; (3) Tencent Inc., China

Source title: Proceedings of the VLDB Endowment

Abbreviated source title:Proc. VLDB Endow.

Volume: 16

Issue: 6

Issue date: 2023

Publication Year: 2023

Pages: 1264-1276

Language: English

Document type:Conference article (CA)

Conference name:49th International Conference on Very Large Data Bases, VLDB 2023

Conference date:August 28, 2023 - September 1, 2023

Conference location:Vancouver, BC, Canada

Conference code:284499

Publisher:VLDB Endowment

Abstract:Snapshot isolation (SI) is a prevalent weak isolation level that avoids the performance penalty imposed by serializability and simultaneously prevents various undesired data anomalies.

Nevertheless, SI anomalies have recently been found in production cloud databases that claim to provide the SI guarantee. Given the complex and often unavailable internals of such databases, a black-box SI checker is highly desirable. In this paper we present PolySI, a black-box checker that efficiently checks SI and provides understandable counterexamples upon detecting violations. PolySI builds on a characterization of SI using generalized polygraphs (GPs), for which we establish its soundness and completeness. PolySI employs an SMT solver and also accelerates SMT solving by utilizing a compact constraint encoding of GPs and domain-specific optimizations for pruning constraints. As our extensive assessment demonstrates, PolySI successfully reproduces all of 2477 known SI anomalies, detects novel SI violations in three production cloud databases, identifies their causes, outperforms the state-of-the-art black-box checkers under a wide range of workloads, and can scale up to large workloads. © 2023, VLDB Endowment. All rights reserved.

Number of references:48

Uncontrolled terms:['Black boxes', 'Cloud database', 'Data anomalies', 'Domain specific', 'Encodings', 'Isolation level', 'Performance penalties', 'Serializability', 'Snapshot isolation', 'Soundness and completeness']

DOI:10.14778/3583140.3583145

Funding Text:We thank the reviewers for their helpful feedback. Si Liu would like to express his sincere gratitude to Qian Li for her love and encouragement throughout this project. This work was supported by the CCF-Tencent Open Fund (Tencent RAGR20200201).

Compendex references:YES

Database: Compendex

Data Provider:Engineering Village

Compilation and indexing terms, © 2023 Elsevier Inc.

Classification code:443 Meteorology - 443.1 Atmospheric Properties - 483.1 Soils and Soil Mechanics - 922.2 Mathematical Statistics

Article number:133976

<RECORD 5>

Accession number: 20220911728560

Title:Checking Causal Consistency of MongoDB

Authors: Ouyang, Hong-Rong (1);Wei, Heng-Feng (1,2);Li, Hai-Xiang (3);Pan, An-Qun (3);Huang, Yu (1)

Author affiliation: (1) State Key Laboratory for Novel Software Technology, Nanjing University, Nanjing; 210023, China; (2) Software Institute, Nanjing University, Nanjing; 210093, China; (3) Tencent Distributed SQL Team of Technology and Engineering Group of Tencent, Tencent Inc., Shenzhen; 518054, China

Corresponding author: Wei, Heng-Feng(hfwei@nju.edu.cn); Li, Hai-Xiang(blueseali@tencent.com)

Source title: Journal of Computer Science and Technology

Abbreviated source title:J Comput Sci Technol

Volume: 37

Issue: 1

Issue date: February 2022

Publication Year: 2022

Pages: 128-146

Language: English

ISSN:1000-9000

Document type:Journal article (JA)

Publisher:Springer

Abstract:MongoDB is one of the first commercial distributed databases that support causal consistency. Its implementation of causal consistency combines several research ideas for achieving scalability, fault tolerance, and security. Given its inherent complexity, a natural question arises: "Has MongoDB correctly implemented causal consistency as it claimed?" To address this concern, the Jepsen team has conducted black-box testing of MongoDB. However, this Jepsen testing has several drawbacks in terms of specification, test case generation, implementation of causal consistency checking algorithms, and testing scenarios, which

undermine the credibility of its reports. In this work, we propose a more thorough design of Jepsen testing of causal consistency of MongoDB. Specifically, we fully implement the causal consistency checking algorithms proposed by Bouajjani et al. and test MongoDB against three well-known variants of causal consistency, namely CC, CCv, and CM, under various scenarios including node failures, data movement, and network partitions. In addition, we develop formal specifications of causal consistency and their checking algorithms in TLA+, and verify them using the TLC model checker. We also explain how TLA+ specification can be related to Jepsen testing.

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Number of references:29

Main heading:Fault tolerance

Controlled terms:['Black-box testing', 'Model checking', 'Formal specification']

Uncontrolled terms:['Casual consistency', 'Consistency checking', 'Distributed database', 'Inherent complexity', 'Jepsen', 'MongoDB', 'Node failure', 'Specification test', 'Test case generation', 'TLA+']

Classification code:['721.1 Computer Theory, Includes Computational Logic, Automata Theory, Switching Theory, Programming Theory', '723.5 Computer Applications']

DOI:10.1007/s11390-021-1662-8

Compendex references:YES

Database: Compendex

Data Provider:Engineering Village

Compilation and indexing terms, © 2023 Elsevier Inc.

Classification code:443 Meteorology - 443.1 Atmospheric Properties - 483.1 Soils and Soil Mechanics - 922.2 Mathematical Statistics

Article number:133976

<RECORD 6>

Accession number: 20213210724902

Title:UNISTORE: A fault-tolerant marriage of causal and strong consistency

Authors: Bravo, Manuel (1);Gotsman, Alexey (1);De Régil, Borja (1);Wei, Hengfeng (2)

Author affiliation: (1) IMDEA Software Institute; (2) Nanjing University, China

Source title: 2021 USENIX Annual Technical Conference

Abbreviated source title:USENIX Annu. Tech. Conf.

Issue title: 2021 USENIX Annual Technical Conference

Issue date: 2021

Publication Year: 2021

Pages: 923-937

Language: English

ISBN-13:9781939133236

Document type:Conference article (CA)

Conference name:2021 USENIX Annual Technical Conference, ATC 2021

Conference date:July 14, 2021 - July 16, 2021

Conference location:Virtual, Online

Conference code:170531

Publisher:USENIX Association

Abstract:Modern online services rely on data stores that replicate their data across geographically distributed data centers. Providing strong consistency in such data stores results in high latencies and makes the system vulnerable to network partitions. The alternative of relaxing consistency violates crucial correctness properties. A compromise is to allow multiple consistency levels to coexist in the data store. In this paper we present UNISTORE, the first fault-tolerant and scalable data store that combines causal and strong consistency. The key challenge we address in UNISTORE is to maintain liveness despite data center failures: this could be compromised if a strong transaction takes a dependency on a causal transaction that is later lost because of a failure. UNISTORE ensures that such situations do not arise while paying the cost of durability for causal transactions only when necessary. We evaluate UNISTORE on Amazon EC2 using both microbenchmarks and a sample application. Our results show that UNISTORE effectively and scalably combines causal and strong consistency. © 2021 USENIX Annual Technical Conference. All rights reserved.

Number of references:73

Uncontrolled terms:['Consistency level', 'Correctness properties', 'Distributed data', 'Micro-benchmarks', 'Network partitions', 'On-line service', 'Sample applications', 'Strong consistency']

Funding Text:Acknowledgements. We thank our shepherd, Heming Cui, as well as Gregory Chockler, Vitor Enes, Luís Rodrigues and Marc Shapiro for comments and suggestions. This work was partially supported by an ERC Starting Grant RACCOON, the Juan de la Cierva Formación funding scheme (FJC2018-036528-I), the CCF-Tencent Open Fund (CCF-Tencent RAGR20200124) and the AWS Cloud Credit for Research program.

Compendex references:YES

Database: Compendex

Data Provider:Engineering Village

Compilation and indexing terms, © 2023 Elsevier Inc.

Classification code:443 Meteorology - 443.1 Atmospheric Properties - 483.1 Soils and Soil Mechanics - 922.2 Mathematical Statistics

Article number:133976

<RECORD 7>

Accession number: 20212410483481

Title:Raft with Out-of-order Executions

Authors: Gu, Xiao-Song (1);Wei, Heng-Feng (1);Qiao, Lei (2);Huang, Yu (1)

Author affiliation: (1) State Key Laboratory for Novel Software Technology, Nanjing University, Nanjing; 210023, China; (2) Beijing Institute of Control Engineering, Beijing; 100190, China

Corresponding author: Wei, Heng-Feng(hfwei@nju.edu.cn); Qiao, Lei(fly2moon@aliyun.com)

Source title: Journal of Software

Abbreviated source title:Ruan Jian Xue Bao

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Issue: 6

Issue date: June 2021

Publication Year: 2021

Pages: 1748-1778

Language: Chinese

ISSN:1000-9825

Document type:Journal article (JA)

Publisher:Chinese Academy of Sciences

Abstract:PolarFS is a distributed file system developed by Alibaba Inc. with ultra-low latency and high availability. It implemented a variant of the Raft consensus protocol, called ParallelRaft. ParallelRaft breaks Raft's strict serialization restrictions in the commitment and execution of log entries and enables state machines to commit and execute log entries in an out-of-order way. However, ParallelRaft is not open-sourced. It has only a brief description, lacking formal specification. Moreover, the correctness of ParallelRaft has not been manually proven or formally checked. The purpose of the study is to provide a precise formal specification for ParallelRaft and to prove its correctness. Specifically, the following main contributions are accomplished. First, to clarify the relationship between Raft and ParallelRaft, ParallelRaft-SE (sequential execution) is proposed, which allows out-of-order commitment but prohibits out-of-order executions. Also, a refinement mapping from ParallelRaft-SE to Multi-Paxos is established. Second, it is discovered that ParallelRaft, according to its brief description in the literature, neglects the so-called "ghost log entries" phenomenon, which may violate the consistency among state machines. Therefore, based on ParallelRaft-SE, ParallelRaft-CE (concurrent execution) is proposed. ParallelRaft-CE avoids the "ghost log entries" phenomenon and ensures the consistency among state machine when executing concurrently by limiting parallelism in the commitment of log entries. The correctness of ParallelRaft-CE is proved manually. Finally, the formal specifications of ParallelRaft-SE and ParallelRaft-CE using TLA+ (TLA stands for temporal logic of actions) are provided, and the refinement mapping from ParallelRaft-SE to Multi-Paxos and the correctness of ParallelRaft-CE are verified using the TLC model checker when the number of participants of the protocols is small. © Copyright 2021, Institute of Software, the Chinese Academy of Sciences. All rights reserved.

Number of references:36  
Main heading:Model checking  
Controlled terms:['File organization', 'Mapping', 'Formal specification']  
Uncontrolled terms:['Concurrent execution', 'Consensus protocols', 'Distributed file systems', 'High availability', 'Out-of-order execution', 'Refinement mapping', 'Sequential execution', 'Temporal logic of actions']  
Classification code:['405.3 Surveying', '721.1 Computer Theory, Includes Computational Logic, Automata Theory, Switching Theory, Programming Theory', '723.5 Computer Applications', '903.3 Information Retrieval and Use']  
DOI:10.13328/j.cnki.jos.006248  
Funding Text:National Natural Science Foundation of China (61932021, 61772258); Space Advanced Computing and Electronic Information Laboratory of BICE (OBCandETL-2020-04).  
Compendex references:YES  
Database: Compendex  
Data Provider:Engineering Village  
Compilation and indexing terms, © 2023 Elsevier Inc.  
Classification code:443 Meteorology - 443.1 Atmospheric Properties - 483.1 Soils and Soil Mechanics - 922.2 Mathematical Statistics  
Article number:133976

<RECORD 8>

Accession number: 20203709158744  
Title:Fine-grained Analysis on Fast Implementations of Distributed Multi-writer Atomic Registers  
Authors: Huang, Kaile (1);Huang, Yu (1);Wei, Hengfeng (1)  
Author affiliation: (1) State Key Laboratory for Novel Software Technology, Nanjing University, Nanjing, Jiangsu Province, China  
Source title: Proceedings of the Annual ACM Symposium on Principles of Distributed Computing  
Abbreviated source title:Proc Annu ACM Symp Princ Distrib Comput  
Issue title: PODC 2020 - Proceedings of the 39th Symposium on Principles of Distributed Computing  
Issue date: July 31, 2020  
Publication Year: 2020  
Pages: 200-209  
Language: English  
ISBN-13:9781450375825  
Document type:Conference article (CA)  
Conference name:39th Symposium on Principles of Distributed Computing, PODC 2020  
Conference date:August 3, 2020 - August 7, 2020  
Conference location:Virtual, Online, Italy  
Conference code:162056  
Publisher:Association for Computing Machinery  
Abstract:Distributed multi-writer atomic registers are at the heart of a large number of distributed algorithms. While enjoying the benefits of atomicity, researchers further explore fast implementations of atomic registers which are optimal in terms of data access latency. Though it is proved that multi-writer atomic register implementations are impossible when both read and write are required to be fast, it is still open whether implementations are impossible when only write or read is required to be fast. This work proves the impossibility of fast write implementations based on a series of chain arguments among indistinguishable executions. We also show the necessary and sufficient condition for fast read implementations by extending the results in the single-writer case. This work concludes a series of studies on fast implementations of distributed atomic registers. © 2020 ACM.  
Number of references:28  
Main heading:Atoms  
Uncontrolled terms:['Atomic register', 'Data access', 'Fast implementation', 'Fast read', 'Fine-grained analysis']  
Classification code:['931.3 Atomic and Molecular Physics']  
DOI:10.1145/3382734.3405698



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Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

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Classification code: 443 Meteorology - 443.1 Atmospheric Properties - 483.1 Soils and Soil Mechanics - 922.2 Mathematical Statistics

Article number: 133976

<RECORD 9>

Accession number: 20203509114499

Title: TPaxos Consensus Protocol in PaxosStore: Derivation, Specification, and Refinement

Authors: Yi, Xing-Chen (1); Wei, Heng-Feng (1); Huang, Yu (1); Qiao, Lei (2); Lü, Jian (1)

Author affiliation: (1) State Key Laboratory for Novel Software Technology, Nanjing University, Nanjing; 210023, China; (2) Beijing Institute of Control Engineering, Beijing; 100190, China

Corresponding author: Wei, Heng-Feng (hfwei@nju.edu.cn)

Source title: Journal of Software

Abbreviated source title: Ruan Jian Xue Bao

Volume: 31

Issue: 8

Issue date: August 1, 2020

Publication Year: 2020

Pages: 2336-2361

Language: Chinese

ISSN: 1000-9825

Document type: Journal article (JA)

Publisher: Chinese Academy of Sciences

Abstract: PaxosStore is a highly available distributed storage system developed by Tencent Inc. to support the comprehensive business of WeChat. PaxosStore employs a variant of Paxos which is a classic protocol for solving distributed consensus. It is called as TPaxos in this study. The originality of TPaxos lies in its "uniformity": it maintains a unified state type for each participant and adopts a universal message format for communication. However, this design choice brings various differences between TPaxos and Paxos, rendering TPaxos hard to understand. Moreover, although the core code (including both pseudocode and source code in C++) for TPaxos is publicly available, there still lacks a formal specification of TPaxos. Finally, as far as literature demonstrates, TPaxos has not yet been manually proven or formally checked. To address these issues, three main contributions are expounded in this paper. First, it is demonstrated that how to derive TPaxos from classic Paxos step by step. Based on this derivation, TPaxos can be regarded as a natural variant of Paxos and is much easier to understand. Second, TPaxos in TLA+, a formal specification language, is described. In the course of developing the TLA+ specification for TPaxos, a crucial but subtle detail is uncovered in TPaxos which is not fully clarified. That is, upon messages, do the participants (as acceptors) make promise that no proposals with smaller proposal numbers will be accepted before accepting proposals or vice versa? This leads to two different interpretations of TPaxos and motivates authors to propose a variant of TPaxos, called TPaxosAP. In TPaxosAP, the participants accept proposals first, and then make promise. Third, the correctness of both TPaxos and TPaxosAP is verified by refinement. Particularly, since the known voting mechanism called Voting cannot capture all the behaviors of TPaxosAP, EagerVoting for TPaxosAP is first proposed and then the refinement mappings are established from TPaxosAP to EagerVoting and from EagerVoting to consensus. They are also verified using the TLC model checker. © Copyright 2020, Institute of Software, the Chinese Academy of Sciences. All rights reserved.

Number of references: 44

Main heading:Model checking

Controlled terms:['Multiprocessing systems', 'C++ (programming language)', 'Formal specification', 'Specification languages', 'Codes (symbols)']

Uncontrolled terms:['Consensus protocols', 'Distributed consensus', 'Distributed storage system', 'Message format', 'Model checker', 'Refinement mapping', 'Source codes', 'Voting mechanism']

Classification code:['721.1 Computer Theory, Includes Computational Logic, Automata Theory, Switching Theory, Programming Theory', '722.4 Digital Computers and Systems', '723.1.1 Computer Programming Languages', '723.2 Data Processing and Image Processing', '723.5 Computer Applications']

DOI:10.13328/j.cnki.jos.005964

Funding Text:National Natural Science Foundation of China (61690204, 61702253, 61772258).

Compendex references:YES

Database: Compendex

Data Provider:Engineering Village

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Classification code:443 Meteorology - 443.1 Atmospheric Properties - 483.1 Soils and Soil Mechanics - 922.2 Mathematical Statistics

Article number:133976

<RECORD 10>

Accession number: 20202508857842

Title:Specifying and Verifying CRDT Protocols Using TLA+

Authors: Ji, Ye (1);Wei, Heng-Feng (1);Huang, Yu (1);Lü, Jian (1)

Author affiliation: (1) State Key Laboratory for Novel Software Technology, Nanjing University, Nanjing; 210023, China

Corresponding author: Wei, Heng-Feng(hfwei@nju.edu.cn)

Source title: Journal of Software

Abbreviated source title:Ruan Jian Xue Bao

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Issue: 5

Issue date: May 1, 2020

Publication Year: 2020

Pages: 1332-1352

Language: Chinese

ISSN:1000-9825

Document type:Journal article (JA)

Publisher:Chinese Academy of Sciences

Abstract:Conflict-free replicated data types (CRDT) are replicated data types that encapsulate the mechanisms for resolving concurrent conflicts. They guarantee strong eventual consistency among replicas in distributed systems, which requires replicas that have executed the same set of updates be in the same state. However, CRDT protocols are subtle and it is difficult to ensure their correctness. This study leverages model checking to verify the correctness of CRDT protocols. Specifically, a reusable framework is proposed for modelling and verifying CRDT protocols. The framework consists of four layers, i.e., the communication layer, the interface layer, the protocol layer, and the specification layer. The communication layer models the communication among replicas and implements a variety of communication networks. The interface layer provides a uniform interface for existing CRDT protocols, including both the operation-based protocols and the state-based ones. In the protocol layer, users can choose the appropriate underlying communication network required by a specific protocol. The specification layer specifies strong eventual consistency and the eventual visibility property (i.e., all updates are eventually delivered by all replicas) that every CRDT protocol should satisfy. This framework is implemented using a formal specification language called TLA+. It is also demonstrated that how to model CRDT protocols in this framework and how to verify their correctness via the model checking tool called TLC, taking Add-Wins Set as an example. © Copyright 2020, Institute of Software, the Chinese Academy of Sciences. All rights reserved.

Number of references:34

Main heading:Interface states

Controlled terms:['Specification languages', 'Model checking', 'Visibility']  
Uncontrolled terms:['Communication layers', 'Distributed systems', 'Eventual consistency', 'Model checking tools', 'Protocol layers', 'Replicated data', 'Specific protocol', 'Uniform interface']  
Classification code:['721.1 Computer Theory, Includes Computational Logic, Automata Theory, Switching Theory, Programming Theory', '723.1.1 Computer Programming Languages', '741.2 Vision', '931 Classical Physics; Quantum Theory; Relativity', '932 High Energy Physics; Nuclear Physics; Plasma Physics']  
DOI:10.13328/j.cnki.jos.005956  
Funding Text:National Key Research and Development Program of China (2017YFB1001801); National Natural Science Foundation of China (61702253, 61772258).  
Compendex references:YES  
Database: Compendex  
Data Provider:Engineering Village  
Compilation and indexing terms, © 2023 Elsevier Inc.  
Classification code:443 Meteorology - 443.1 Atmospheric Properties - 483.1 Soils and Soil Mechanics - 922.2 Mathematical Statistics  
Article number:133976

<RECORD 11>

Accession number: 20205009598339  
Title:Jupiter Made Abstract, and Then Refined  
Authors: Wei, Heng-Feng (1);Tang, Rui-Ze (1);Huang, Yu (1);Lv, Jian (1)  
Author affiliation: (1) State Key Laboratory for Novel Software Technology, Nanjing University, Nanjing; 210023, China  
Corresponding author: Huang, Yu(yuhuang@nju.edu.cn)  
Source title: Journal of Computer Science and Technology  
Abbreviated source title:J Comput Sci Technol  
Volume: 35  
Issue: 6  
Issue date: November 2020  
Publication Year: 2020  
Pages: 1343-1364  
Language: English  
ISSN:1000-9000  
Document type:Journal article (JA)  
Publisher:Springer  
Abstract:Collaborative text editing systems allow multiple users to concurrently edit the same document, which can be modeled by a replicated list object. In the literature, there is a family of operational transformation (OT)-based Jupiter protocols for replicated lists, including AJupiter, XJupiter, and CJupiter. They are hard to understand due to the subtle OT technique, and little work has been done on formal verification of complete Jupiter protocols. Worse still, they use quite different data structures. It is unclear about how they are related to each other, and it would be laborious to verify each Jupiter protocol separately. In this work, we make contributions towards a better understanding of Jupiter protocols and the relation among them. We first identify the key OT issue in Jupiter and present a generic solution. We summarize several techniques for carrying out the solution, including the data structures to maintain OT results and to guide OTs. Then, we propose an implementation-independent AbsJupiter protocol. Finally, we establish the (data) refinement relation among these Jupiter protocols (AbsJupiter included). We also formally specify and verify the family of Jupiter protocols and the refinement relation among them using TLA+ (TLA stands for "Temporal Logic of Actions") and the TLC model checker. To our knowledge, this is the first work to formally specify and verify a family of OT-based Jupiter protocols and the refinement relation among them. It would be helpful to promote a rigorous study of OT-based protocols. © 2020, Institute of Computing Technology, Chinese Academy of Sciences.  
Number of references:25  
Main heading:Data structures  
Controlled terms:['Abstracting', 'Model checking']

Uncontrolled terms:['Generic solutions', 'Jupiters', 'Model checker', 'Multiple user', 'Operational transformation', 'Temporal logic of actions', 'Text editing']

Classification code:['721.1 Computer Theory, Includes Computational Logic, Automata Theory, Switching Theory, Programming Theory', '723.2 Data Processing and Image Processing', '903.1 Information Sources and Analysis']

DOI:10.1007/s11390-020-0516-0

Compendex references:YES

Database: Compendex

Data Provider:Engineering Village

Compilation and indexing terms, © 2023 Elsevier Inc.

Classification code:443 Meteorology - 443.1 Atmospheric Properties - 483.1 Soils and Soil Mechanics - 922.2 Mathematical Statistics

Article number:133976

<RECORD 12>

Accession number: 20205109660741

Title:A Generic Specification Framework for Weakly Consistent Replicated Data Types

Authors: Jiang, Xue (1);Wei, Hengfeng (1);Huang, Yu (1)

Author affiliation: (1) Nanjing University, State Key Laboratory for Novel Software Technology, China

Source title: Proceedings of the IEEE Symposium on Reliable Distributed Systems

Abbreviated source title:Proc IEEE Symp Reliab Distrib Syst

Volume: 2020-September

Issue title: Proceedings - 2020 International Symposium on Reliable Distributed Systems, SRDS 2020

Issue date: September 2020

Publication Year: 2020

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Conference name:39th International Symposium on Reliable Distributed Systems, SRDS 2020

Conference date:September 21, 2020 - September 24, 2020

Conference location:Virtual, Shanghai, China

Conference code:164987

Publisher:IEEE Computer Society

Abstract:Recently Burckhardt et al. proposed a formal specification framework for eventually consistent replicated data types, denoted (vis, ar), based on the notions of visibility and arbitration relations. However, being specific to eventually consistent systems, this framework has two limitations. First, it does not cover non-convergent consistency models since arbitration ar is defined to be a total order over events in a computation. Second, it does not cover the consistency models in which each event is required to be aware of the return values of some or all events that are visible to it. In this paper, we extend the (vis, ar) specification framework into a more generic one called (vis, ar, V) for weakly consistent replicated data types. To specify non-convergent consistency models as well, we simply relax the arbitration relation ar to be a partial order. To overcome the second limitation, we allow to specify for each event e, a subset V(e) of its visible set whose return values cannot be ignored when justifying the return value of e. To make it practically feasible, we provide candidates for the visibility and arbitration relations and the V function. By combining these candidates, we demonstrate how to specify various existing consistency models in the (vis, ar, V) framework. Moreover, it helps to discover new consistency models. As a case study, we prove that the causal consistency protocol of MongoDB database satisfies Causal Memory Convergence, a new causal consistency variant discovered in our framework. © 2020 IEEE.

Number of references:27

Main heading:Visibility

Controlled terms:['Formal specification']

Uncontrolled terms:['Causal memory', 'Consistency model', 'Consistency protocol', 'Generic specifications', 'Partial order', 'Replicated data', 'Return value', 'Specification frameworks']  
Classification code:['723.5 Computer Applications', '741.2 Vision']  
DOI:10.1109/SRDS51746.2020.00022  
Compendex references:YES  
Database: Compendex  
Data Provider:Engineering Village  
Compilation and indexing terms, © 2023 Elsevier Inc.  
Classification code:443 Meteorology - 443.1 Atmospheric Properties - 483.1 Soils and Soil Mechanics - 922.2 Mathematical Statistics  
Article number:133976

<RECORD 13>

Accession number: 20170803366395  
Title:Probabilistically-Atomic 2-Atomicity: Enabling Almost Strong Consistency in Distributed Storage Systems  
Authors: Wei, Hengfeng (1);Huang, Yu (1);Lu, Jian (1)  
Author affiliation: (1) State Key Laboratory for Novel Software Technology, Nanjing University, Nanjing, Jiangsu; 210023, China  
Corresponding author: Huang, Yu(yuhuang@nju.edu.cn)  
Source title: IEEE Transactions on Computers  
Abbreviated source title:IEEE Trans Comput  
Volume: 66  
Issue: 3  
Issue date: March 1, 2017  
Publication Year: 2017  
Pages: 502-514  
Language: English  
ISSN:0018-9340  
Document type:Journal article (JA)  
Publisher:IEEE Computer Society

Abstract:A consistency/latency tradeoff arises as soon as a distributed storage system replicates data. For low latency, distributed storage systems often settle for weak consistency conditions, providing little guarantee on data consistency. In this paper, we propose the notion of almost strong consistency as an option for the consistency/latency tradeoff. It provides both deterministically bounded staleness of data versions for reads and probabilistic quantification on the rate of 'reading stale data', while achieving low latency. We then investigate almost strong consistency in terms of probabilistically-atomic 2-atomicity. Our PA2AM algorithm for the single-writer model completes each read in one communication round-trip, and guarantees that each read obtains the value of within the latest two versions. To quantify the rate of 'reading the stale version', we decompose the so-called 'old-new inversion' anomaly into long-lived-write concurrency patterns and non-monotonic read-write patterns, and propose a queueing model and a timed balls-into-bins model to analyze them, respectively. The probabilistic analysis not only demonstrates that old-new inversions rarely occur, but also reveals that the read-write pattern dominates in preventing them from occurring. These are then supported by our experiments. To further demonstrate the benefits of probabilistically-atomic 2-atomicity, we also compare it to weak consistency conditions. © 2017 IEEE.

Number of references:45

Main heading:Multiprocessing systems

Controlled terms:['Digital storage', 'Atoms', 'Queueing theory']

Uncontrolled terms:['bounded staleness', 'Consistency conditions', 'consistency/latency tradeoff', 'probabilistically-atomic 2-atomicity', 'Strong consistency']

Classification code:['722.1 Data Storage, Equipment and Techniques', '722.4 Digital Computers and Systems', '922.1 Probability Theory', '931.3 Atomic and Molecular Physics']

DOI:10.1109/TC.2016.2601322

Funding Text:This work is supported by the National 973 Program of China (2015CB352202), the National Science Foundation of China (61272047, 91318301, 61321491), the Collaborative

Innovation Center of Novel Software Technology and Industrialization, and the program A for Outstanding PhD candidate of Nanjing University. The authors are grateful for the constructive discussions from MathOverflow,<sup>13</sup> on the calculations in Section 4. Finally, the insightful comments of the anonymous reviewers greatly improved this paper.

Compendex references: YES

Database: Compendex

Data Provider: Engineering Village

Compilation and indexing terms, © 2023 Elsevier Inc.

Classification code: 443 Meteorology - 443.1 Atmospheric Properties - 483.1 Soils and Soil Mechanics - 922.2 Mathematical Statistics

Article number: 133976

<RECORD 14>

Accession number: 20175104554722

Title: Parameterized and runtime-tunable snapshot isolation in distributed transactional key-value stores

Authors: Wei, Hengfeng (1); Huang, Yu (1); Lu, Jian (1)

Author affiliation: (1) State Key Laboratory for Novel Software Technology, Nanjing University, China

Source title: Proceedings of the IEEE Symposium on Reliable Distributed Systems

Abbreviated source title: Proc IEEE Symp Reliab Distrib Syst

Volume: 2017-September

Issue title: Proceedings - 2017 IEEE 36th International Symposium on Reliable Distributed Systems, SRDS 2017

Issue date: October 13, 2017

Publication Year: 2017

Pages: 21-33

Language: English

ISSN: 1060-9857

ISBN-13: 9781538616796

Document type: Conference article (CA)

Conference name: 36th IEEE International Symposium on Reliable Distributed Systems, SRDS 2017

Conference date: September 26, 2017 - September 29, 2017

Conference location: Hong Kong, Hong Kong

Conference code: 131426

Publisher: IEEE Computer Society

Abstract: Several relaxed variants of Snapshot Isolation (SI) have been proposed for improved performance in distributed transactional key-value stores. These relaxed variants, however, provide no specification or control of the severity of the anomalies with respect to SI. They have also been designed to be used statically throughout the whole system life cycle. To overcome these drawbacks, we propose the idea of parameterized and runtime-tunable snapshot isolation. We first define a new transactional consistency model called Relaxed Version Snapshot Isolation (RVSI), which can formally and quantitatively specify the anomalies it may produce with respect to SI. To this end, we decompose SI into three 'view properties', for each of which we introduce a parameter to quantify one of three kinds of possible anomalies: k1-BV (k1-version bounded backward view), k2-FV (k2-version bounded forward view), and k3-SV (k3-version bounded snapshot view). We then implement a prototype partitioned replicated distributed transactional key-value store called Chameleon across multiple data centers. While achieving RVSI, Chameleon allows each transaction to dynamically tune its consistency level at runtime. The experiments show that RVSI helps to reduce the transaction abort rates when applications are willing to tolerate certain anomalies. We also evaluate the individual impacts of k1-BV, k2-FV, and k3-SV on reducing the transaction abort rates in various scenarios. We find that it depends on the issue delays between clients and replicas which of k1 and k2 plays a major role in reducing transaction abort rates. © 2017 IEEE.

Number of references: 27

Main heading: Life cycle

Uncontrolled terms:['Consistency level', 'Consistency model', 'Key-value stores', 'Multiple data', 'Parameterized', 'Runtimes', 'Snapshot isolation', 'System life cycle']  
Classification code:['723.3 Database Systems']  
DOI:10.1109/SRDS.2017.11  
Compendex references:YES  
Database: Compendex  
Data Provider:Engineering Village  
Compilation and indexing terms, © 2023 Elsevier Inc.  
Classification code:443 Meteorology - 443.1 Atmospheric Properties - 483.1 Soils and Soil Mechanics - 922.2 Mathematical Statistics  
Article number:133976

<RECORD 15>

Accession number: 20161702294016  
Title:Verifying Pipelined-RAM Consistency over Read/Write Traces of Data Replicas  
Authors: Wei, Hengfeng (1);De Biasi, Marzio (2);Huang, Yu (1);Cao, Jiannong (3);Lu, Jian (1)  
Author affiliation: (1) State Key Laboratory for Novel Software Technology, Nanjing University, Nanjing; 210023, China; (2) Computational Complexity, Puzzles and Machines Organization, Italy; (3) Hong Kong Polytechnic University, Hong Kong  
Corresponding author: Huang, Yu(yuhuang@nju.edu.cn)  
Source title: IEEE Transactions on Parallel and Distributed Systems  
Abbreviated source title:IEEE Trans Parallel Distrib Syst  
Volume: 27  
Issue: 5  
Issue date: May 1, 2016  
Publication Year: 2016  
Pages: 1511-1523  
Language: English  
ISSN:1045-9219  
Document type:Journal article (JA)  
Publisher:IEEE Computer Society  
Abstract:Data replication technologies in distributed storage systems introduce the problem of data consistency. For high performance, data replication systems often settle for weak consistency models, such as Pipelined-RAM consistency. To determine whether a data replication system provides Pipelined-RAM consistency, we study the problem of verifying Pipelined-RAM consistency over read/write traces (VPC, for short). Four variants of VPC (labeled VPC-SU, VPC-MU, VPC-SD, and VPC-MD) are identified according to whether there are Multiple shared variables (or one Single variable) and whether write operations can assign Duplicate values (or only Unique values) to each shared variable. We prove that VPC-SD is NP-complete (so is VPC-MD) by reducing the strongly NP-complete problem 3-Partition to it. For VPC-MU, we present the Read-Centric algorithm with time complexity  $O(n^4)$ , where  $n$  is the number of operations. The algorithm constructs an operation graph by iteratively applying a rule which guarantees that no overwritten values can be read later. It incrementally processes all the read operations one by one, and exploits the total order between the dictating writes on the same variable to avoid redundant applications of the rule. The experiments have demonstrated its practical efficiency and scalability. © 1990-2012 IEEE.  
Number of references:25  
Main heading:Random access storage  
Controlled terms:['Iterative methods', 'Multiprocessing systems', 'Computational complexity', 'Pipelines']  
Uncontrolled terms:['Consistency model', 'Data consistency', 'Data replication', 'Distributed storage system', 'Shared variables', 'Single variable', 'Weak consistency', 'Write operations']  
Classification code:['619.1 Pipe, Piping and Pipelines', '721.1 Computer Theory, Includes Computational Logic, Automata Theory, Switching Theory, Programming Theory', '722.1 Data Storage, Equipment and Techniques', '722.4 Digital Computers and Systems', '921.6 Numerical Methods']  
DOI:10.1109/TPDS.2015.2453985

Compendex references: YES  
Database: Compendex  
Data Provider: Engineering Village  
Compilation and indexing terms, © 2023 Elsevier Inc.  
Classification code: 443 Meteorology - 443.1 Atmospheric Properties - 483.1 Soils and Soil Mechanics - 922.2 Mathematical Statistics  
Article number: 133976

<RECORD 16>

Accession number: 20122315082503  
Title: Formal specification and runtime detection of temporal properties for asynchronous context  
Authors: Wei, Hengfeng (1,2); Huang, Yu (1,2); Cao, Jiannong (3); Ma, Xiaoxing (1,2); Lu, Jian (1,2)  
Author affiliation: (1) State Key Laboratory for Novel Software Technology, Nanjing University, Nanjing 210093, China; (2) Institute of Computer Software, Nanjing University, Nanjing 210093, China; (3) Internet and Mobile Computing Lab, Department of Computing, Hong Kong Polytechnic University, Hong Kong, Hong Kong  
Corresponding author: Huang, Y. (yuhuang@nju.edu.cn)  
Source title: 2012 IEEE International Conference on Pervasive Computing and Communications, PerCom 2012  
Abbreviated source title: IEEE Int. Conf. Pervasive Comput. Commun., PerCom  
Issue title: 2012 IEEE International Conference on Pervasive Computing and Communications, PerCom 2012  
Issue date: 2012  
Publication Year: 2012  
Pages: 30-38  
Language: English  
ISBN-13: 9781467302586  
Document type: Conference article (CA)  
Conference name: 10th IEEE International Conference on Pervasive Computing and Communications, PerCom 2012  
Conference date: March 19, 2012 - March 23, 2012  
Conference location: Lugano, Switzerland  
Conference code: 89962  
Publisher: IEEE Computer Society  
Abstract: Formal specification and runtime detection of temporal properties for pervasive context is one of the primary approaches to achieving context-awareness. Though temporal logics have been widely used in specification of temporal properties, they are faced with severe challenges in Pervasive Computing (PvC) scenarios. First, temporal logics are traditionally defined over infinite traces of possible system behavior. However in PvC scenarios, applications observe finite prefixes of (potentially infinite) traces of environment state evolution, and adapt their behavior accordingly. Second, specification and detection of temporal properties are challenged by the intrinsic asynchrony of PvC environments. Discussions above necessitate a systematic approach to formal specification and runtime detection of temporal properties for asynchronous context. To this end, we propose CTL3 (3-valued Computation Tree Logic), which i) adopts 3-valued semantics to capture the inconclusiveness when applications only observe finite prefixes of environment state evolution; ii) inherits the notion of branching time to capture the uncertainty resulting from the asynchrony of PvC environments. A case study is conducted to demonstrate how CTL3 supports context-awareness in PvC scenarios. The runtime checking algorithm of CTL3 is implemented and evaluated over MIPA-the open-source context-aware middle-ware we developed. The case study demonstrates the necessity of adopting CTL3 in PvC scenarios, while the performance measurements show the cost-effectiveness of runtime checking contextual properties in CTL3. © 2012 IEEE.  
Number of references: 27  
Main heading: Ubiquitous computing  
Controlled terms: ['Cost effectiveness', 'Formal specification', 'Semantics', 'Temporal logic']  
Uncontrolled terms: ['3-valued semantics', 'Branching time', 'Computation tree logic', 'Context-']



awareness', 'Contextual properties', 'Environment state', 'Performance measurements', 'Run-time checking']

Classification code:['461.4 Ergonomics and Human Factors Engineering', '723.5 Computer Applications', '911.2 Industrial Economics']

DOI:10.1109/PerCom.2012.6199846

Compendex references:YES

Database: Compendex

Data Provider:Engineering Village

Compilation and indexing terms, © 2023 Elsevier Inc.

Classification code:443 Meteorology - 443.1 Atmospheric Properties - 483.1 Soils and Soil Mechanics - 922.2 Mathematical Statistics

Article number:133976

## 六、魏恒峰的研究论文被 WOS 核心合集引用的情况

第 1 条, 共 10 条

文献标题:IsoVista: Black-box Checking Database Isolation Guarantees

作者:Gu, Long;Liu, Si;Xing, Tiancheng;Wei, Hengfeng;Chen, Yuxing;Basin, David

出版物名称:PROCEEDINGS OF THE VLDB ENDOWMENT 出版年:2024 卷:17 期:12

页数:4325-4328 DOI:10.14778/3685800.3685866

入藏号:WOS:001378223700018

国际标准期刊号 (ISSN):2150-8097

该文献被引次数: 0 次

第 2 条, 共 10 条

文献标题:Efficient Black-box Checking of Snapshot Isolation in Databases

作者:Huang, Kaile;Liu, Si;Chen, Zheng;Wei, Hengfeng;Basin, David;Li, Haixiang;Pan, Anqun

出版物名称:PROCEEDINGS OF THE VLDB ENDOWMENT 出版年:2023 卷:16 期:6 页数:1264-1276 DOI:10.14778/3583140.3583145

入藏号:WOS:000992408800006

国际标准期刊号 (ISSN):2150-8097

该文献被引次数: 4 次

### **2-1.IsoVista: Black-box Checking Database Isolation Guarantees[自引文献]**

Authors:Gu, L (Gu, Long);Liu, S (Liu, Si);Xing, TC (Xing, Tiancheng);Wei, HF (Wei, Hengfeng);Chen, YX (Chen, Yuxing);Basin, D (Basin, David)

Source:PROCEEDINGS OF THE VLDB ENDOWMENT, volume: 17 issue: 12 pages: 4325-4328.Published: AUG 2024

### **2-2.Plume: Efficient and Complete Black-Box Checking of Weak Isolation Levels[自引文献]**

Authors:Liu, S (Liu, Si);Gu, L (Gu, Long);Wei, HF (Wei, Hengfeng);Basin, D (Basin, David)

Source:PROCEEDINGS OF THE ACM ON PROGRAMMING LANGUAGES-PACMPL, volume: 8 issue: OOPSLA.Published: OCT 2024

### **2-3.Checking Transaction Isolation Violations Using Graph Queries**

Authors:Dumbrava, S (Dumbrava, Stefania);Jin, Z (Jin, Zhao);Ozkan, BK (Ozkan, Burcu Kulahcioglu);Qiu, JX (Qiu, Jingxuan)

Source:GRAPH TRANSFORMATION, ICGT 2024, volume: 14774 pages: 203-213.Published: 2024

### **2-4.Detecting Transactional Bugs in Database Engines via Graph-Based Oracle Construction**

Authors:Jiang, ZM (Jiang, Zu-Ming);Liu, S (Liu, Si);Rigger, M (Rigger, Manuel);Su, ZD (Su, Zhendong)

Source:PROCEEDINGS OF THE 17TH USENIX SYMPOSIUM ON OPERATING SYSTEMS DESIGN AND IMPLEMENTATION, OSDI 2023 pages: 397-417.Published: 2023

第 3 条, 共 10 条

文献标题:Checking Causal Consistency of MongoDB

作者:Ouyang, Hong-Rong;Wei, Heng-Feng;Li, Hai-Xiang;Pan, An-Qun;Huang, Yu  
出版物名称:JOURNAL OF COMPUTER SCIENCE AND TECHNOLOGY 出版年:2022  
卷:37 期:1 页数:128-146 DOI:10.1007/s11390-021-1662-8  
入藏号:WOS:000757837300008  
国际标准期刊号 (ISSN):1000-9000  
该文献被引次数: 0 次

第 4 条, 共 10 条

文献标题:UNISTORE: A fault-tolerant marriage of causal and strong consistency  
作者:Bravo, Manuel;Gotsman, Alexey;de Regil, Borja;Wei, Hengfeng  
出版物名称:PROCEEDINGS OF THE 2021 USENIX ANNUAL TECHNICAL CONFERENCE  
出版年:2021 页数:923-937  
入藏号:WOS:000696708600061  
该文献被引次数: 3 次

**4-1.Edge AI-driven neural network predictions for replica sync optimization**

Authors:Xu, ZC (Xu, Zichen);Dong, YC (Dong, Yucong);Lou, JS (Lou, Junsheng);Wang, YY (Wang, Yangyang);Fu, Y (Fu, Yan)

Source:APPLIED SOFT COMPUTING, volume: 165.Published: NOV 2024

**4-2.Transaction Causal Consistent Microservices Simulator**

Authors:Pereira, P (Pereira, Pedro);Silva, AR (Silva, Antonio Rito)

Source:DISTRIBUTED APPLICATIONS AND INTEROPERABLE SYSTEMS, DAIS 2023, volume: 13909 pages: 57-73.Published: 2023

**4-3.Reconciling Earlier Snapshot Time With Local Cache for Optimal Performance Under Transactional Causal Consistency**

Authors:Mo, TQ (Mo, Tieqiang);Li, RF (Li, Renfa);Duan, S (Duan, Shan)

Source:IEEE TRANSACTIONS ON SERVICES COMPUTING, volume: 16 issue: 1 pages: 537-549.Published: JAN 1 2023

第 5 条, 共 10 条

文献标题:A Generic Specification Framework for Weakly Consistent Replicated Data Types

作者:Jiang, Xue;Wei, Hengfeng;Huang, Yu

出版物名称:2020 INTERNATIONAL SYMPOSIUM ON RELIABLE DISTRIBUTED SYSTEMS (SRDS 2020) 出版年:2020 页数:143-154

DOI:10.1109/SRDS51746.2020.00022

入藏号:WOS:000646196200015

国际标准期刊号 (ISSN):1060-9857

该文献被引次数: 1 次

**5-1.Tunable Causal Consistency: Specification and Implementation[自引文献]**

Authors:Jiang, X (Jiang, Xue);Wei, HF (Wei, Hengfeng);Huang, Y (Huang, Yu)

Source:2022 IEEE 28TH INTERNATIONAL CONFERENCE ON PARALLEL AND DISTRIBUTED SYSTEMS, ICPADS pages: 169-176.Published: 2022

第 6 条, 共 10 条

文献标题:Jupiter Made Abstract, and Then Refined

作者:Wei, Heng-Feng;Tang, Rui-Ze;Huang, Yu;Lv, Jian

出版物名称:JOURNAL OF COMPUTER SCIENCE AND TECHNOLOGY 出版年:2020  
卷:35 期:6 页数:1343-1364 DOI:10.1007/s11390-020-0516-0

入藏号:WOS:000596524900008

国际标准期刊号 (ISSN):1000-9000

该文献被引次数: 1 次

**6-1.Checking Causal Consistency of MongoDB[自引文献]**

Authors:Ouyang, HR (Ouyang, Hong-Rong);Wei, HF (Wei, Heng-Feng);Li, HX (Li, Hai-Xiang);Pan, AQ (Pan, An-Qun);Huang, Y (Huang, Yu)

Source:JOURNAL OF COMPUTER SCIENCE AND TECHNOLOGY, volume: 37 issue: 1  
pages: 128-146.Published: FEB 2022

第 7 条, 共 10 条

文献标题:Parameterized and Runtime-tunable Snapshot Isolation in Distributed Transactional Key-value Stores

作者:Wei, Hengfeng;Huang, Yu;Lu, Jian

出版物名称:2017 IEEE 36TH INTERNATIONAL SYMPOSIUM ON RELIABLE  
DISTRIBUTED SYSTEMS (SRDS) 出版年:2017 页数:21-33

DOI:10.1109/SRDS.2017.11

入藏号:WOS:000425924600003

国际标准刊号 (ISSN):1060-9857

该文献被引次数: 18 次

### **7-1.An Improved Faster R-CNN Method to Detect Tailings Ponds from High-Resolution Remote Sensing Images**

Authors:Yan, DC (Yan, Dongchuan);Li, GQ (Li, Guoqing);Li, XQ (Li, Xiangqiang);Zhang, H (Zhang, Hao);Lei, H (Lei, Hua);Lu, KX (Lu, Kaixuan);Cheng, MH (Cheng, Minghua);Zhu, FX (Zhu, Fuxiao)

Source:REMOTE SENSING, volume: 13 issue: 11.Published: JUN 2021

### **7-2.Sign Language Recognition Using Two-Stream Convolutional Neural Networks with Wi-Fi Signals**

Authors:Lee, CC (Lee, Chien-Cheng);Gao, ZJ (Gao, Zhongjian)

Source:APPLIED SCIENCES-BASEL, volume: 10 issue: 24.Published: DEC 2020

### **7-3.A Slimmer Network with Polymorphic and Group Attention Modules for More Efficient Object Detection in Aerial Images**

Authors:Guo, W (Guo, Wei);Li, WH (Li, Weihong);Li, ZH (Li, Zhenghao);Gong, WG (Gong, Weiguo);Cui, JK (Cui, Jinkai);Wang, XR (Wang, Xinran)

Source:REMOTE SENSING, volume: 12 issue: 22.Published: NOV 2020

### **7-4.Detection of Undocumented Building Constructions from Official Geodata Using a Convolutional Neural Network**

Authors:Li, QY (Li, Qingyu);Shi, YL (Shi, Yilei);Auer, S (Auer, Stefan);Roschlaub, R (Roschlaub, Robert);Möst, K (Moest, Karin);Schmitt, M (Schmitt, Michael);Glock, C (Glock, Clemens);Zhu, XX (Zhu, Xiaoxiang)

Source:REMOTE SENSING, volume: 12 issue: 21.Published: NOV 2020

### **7-5.Population-Scale CT-based Body Composition Analysis of a Large Outpatient Population Using Deep Learning to Derive Age-, Sex-, and Race-specific Reference Curves**

Authors:Magudia, K (Magudia, Kirti);Bridge, CP (Bridge, Christopher P.);Bay, CP (Bay, Camden P.);Babic, A (Babic, Ana);Fintelmann, FJ (Fintelmann, Florian J.);Troschel, FM (Troschel, Fabian M.);Miskin, N (Miskin, Nityanand);Wrobel, WC (Wrobel, William C.);Brais, LK (Brais, Lauren K.);Andriole, KP (Andriole, Katherine P.);Wolpin, BM (Wolpin, Brian M.);Rosenthal, MH (Rosenthal, Michael H.)

Source:RADIOLOGY, volume: 298 issue: 2 pages: 319-329.Published: FEB 2021

### **7-6.Advances and Trends in Real Time Visual Crowd Analysis**

Authors:Khan, K (Khan, Khalil);Albattah, W (Albattah, Waleed);Khan, RU (Khan, Rehan Ullah);Qamar, AM (Qamar, Ali Mustafa);Nayab, D (Nayab, Durre)

Source:SENSORS, volume: 20 issue: 18.Published: SEP 2020

### **7-7.Estimation of the Gender Ratio of Chickens Based on Computer Vision: Dataset and Exploration**

Authors:Yao, YZ (Yao, Yuanzhou);Yu, HY (Yu, Haoyang);Mu, J (Mu, Jiong);Li, J (Li, Jun);Pu, HB (Pu, Haibo)

Source:ENTROPY, volume: 22 issue: 7.Published: JUL 2020

### **7-8.2PC\*: a distributed transaction concurrency control protocol of multi-microservice based on cloud computing platform**

Authors:Fan, P (Fan, Pan);Liu, J (Liu, Jing);Yin, W (Yin, Wei);Wang, H (Wang, Hui);Chen, XH (Chen, Xiaohong);Sun, HY (Sun, Haiying)

Source:JOURNAL OF CLOUD COMPUTING-ADVANCES SYSTEMS AND APPLICATIONS, volume: 9 issue: 1.Published: JUL 23 2020

**7-9.Searching ... for what is important**

Authors:Fesenmaier, DR (Fesenmaier, Daniel R.);Pearce, PL (Pearce, Philip L.)

Source:TOURIST BEHAVIOUR: THE ESSENTIAL COMPANION pages: 385-405.Published: 2019

**7-10.Improving Augmented Human Intelligence to Distinguish Burkitt Lymphoma From Diffuse Large B-Cell Lymphoma Cases**

Authors:Mohlman, JS (Mohlman, Jeffrey S.);Leventhal, SD (Leventhal, Samuel D.);Hansen, T (Hansen, Taft);Kohan, J (Kohan, Jessica);Pascucci, V (Pascucci, Valerio);Salama, ME (Salama, Mohamed E.)

Source:AMERICAN JOURNAL OF CLINICAL PATHOLOGY, volume: 153 issue: 6 pages: 743-759.Published: JUN 2020

**7-11.Review and Evaluation of Deep Learning Architectures for Efficient Land Cover Mapping with UAS Hyper-Spatial Imagery: A Case Study Over a Wetland**

Authors:Pashaei, M (Pashaei, Mohammad);Kamangir, H (Kamangir, Hamid);Starek, MJ (Starek, Michael J.);Tissot, P (Tissot, Philippe)

Source:REMOTE SENSING, volume: 12 issue: 6.Published: MAR 2020

**7-12.Few-Shot Personalized Saliency Prediction Based on Adaptive Image Selection Considering Object and Visual Attention**

Authors:Moroto, Y (Moroto, Yuya);Maeda, K (Maeda, Keisuke);Ogawa, T (Ogawa, Takahiro);Haseyama, M (Haseyama, Miki)

Source:SENSORS, volume: 20 issue: 8.Published: APR 2020

**7-13.Structural Building Damage Detection with Deep Learning: Assessment of a State-of-the-Art CNN in Operational Conditions**

Authors:Nex, F (Nex, Francesco);Duarte, D (Duarte, Diogo);Tonolo, FG (Tonolo, Fabio Giulio);Kerle, N (Kerle, Norman)

Source:REMOTE SENSING, volume: 11 issue: 23.Published: DEC 1 2019

**7-14.FFESSD: An Accurate and Efficient Single-Shot Detector for Target Detection**

Authors:Shi, WX (Shi, Wenxu);Bao, SL (Bao, Shengli);Tan, DL (Tan, Dailun)

Source:APPLIED SCIENCES-BASEL, volume: 9 issue: 20.Published: OCT 2019

**7-15.FSRFNet: Feature-selective and Spatial Receptive Fields Networks**

Authors:Ma, XH (Ma, Xianghua);Yang, ZK (Yang, Zhenkun);Yu, ZA (Yu, Zhigiang)

Source:APPLIED SCIENCES-BASEL, volume: 9 issue: 19.Published: OCT 2019

**7-16.Single Space Object Image Denoising and Super-Resolution Reconstructing Using Deep Convolutional Networks**

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Authors:Woo, I (Woo, Ilsang);Lee, A (Lee, Areum);Jung, SC (Jung, Seung Chai);Lee, H (Lee, Hyunna);Kim, N (Kim, Namkug);Cho, SJ (Cho, Se Jin);Kim, D (Kim, Donghyun);Lee, J (Lee, Jungbin);Sunwoo, L (Sunwoo, Leonard);Kang, DW (Kang, Dong-Wha)

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Authors:Tian, WN (Tian, Wenni);Dai, LW (Dai, Liwei);Lu, SM (Lu, Siming);Luo, ZF (Luo, Zhifeng);Qiu, ZY (Qiu, Ziyu);Li, JJ (Li, Junjian);Li, P (Li, Pan);Du, B (Du, Bing)

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文献标题:Probabilistically-Atomic 2-Atomicity: Enabling Almost Strong Consistency in Distributed Storage Systems

作者:Wei, Hengfeng;Huang, Yu;Lu, Jian

出版物名称:IEEE TRANSACTIONS ON COMPUTERS 出版年:2017 卷:66 期:3 页数:502-514 DOI:10.1109/TC.2016.2601322

入藏号:WOS:000395629500010

国际标准期刊号 (ISSN):0018-9340

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Authors:Ouyang, LZ (Ouyang, Lingzhi);Huang, Y (Huang, Yu);Wei, HF (Wei, Hengfeng);Lu, J (Lu, Jian)

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**8-2.IO dependent SSD cache allocation for elastic Hadoop applications**

Authors:Tang, Z (Tang, Zhen);Wang, W (Wang, Wei);Sun, L (Sun, Lei);Huang, Y (Huang, Yu);Wu, H (Wu, Heng);Wei, J (Wei, Jun);Huang, T (Huang, Tao)

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Authors:Liu, JW (Liu, Jiwei);Li, DD (Li, Dingding);Yuan, CZ (Yuan, Chengzhe);Liu, H (Liu, Hai);Tang, Y (Tang, Yang)

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作者:Wei, Hengfeng;De Biasi, Marzio;Huang, Yu;Cao, Jiannong;Lu, Jian

出版物名称:IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS 出版年:2016 卷:27 期:5 页数:1511-1523 DOI:10.1109/TPDS.2015.2453985

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Authors:Huang, Y (Huang, Yi);Wei, HF (Wei, Hengfeng)

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作者:Wei, Hengfeng;Huang, Yu;Cao, Jiannong;Ma, Xiaoxing;Lu, Jian

出版物名称:2012 IEEE INTERNATIONAL CONFERENCE ON PERVASIVE COMPUTING AND COMMUNICATIONS (PERCOM) 出版年:2012 页数:30-38

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Authors:Kabadurmus, O (Kabadurmus, Ozgur);Erdogan, MS (Erdogan, Mehmet S.)

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Authors:Hulagu, S (Hulagu, Selin);Celikoglu, HB (Celikoglu, Hilmi Berk)

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