

# Prefetching:-

Single-Core  
 Multicore  
 Hardware  
 Hybrid  
 Survey

Authors	Paper name	Year	Conference/ Journal
Swanson Steven Tullsen Dean M	Under-clocked Software Prefetching: More Cores Less Energy	2012	MICRO
Liu Gang Peir Jih-Kwon Lee Victor	Miss-Correlation Folding: Encoding Per-Block Miss Correlations in Compressed DRAM for Data Prefetching	2012	IPDPS
Huang Yan Gu Zhi-min Tang Jie Cai Min Zhang Jianxun Zheng Ninghan	Reducing Cache Pollution of Threaded Prefetching by Controlling Prefetch Distance	2012	IPDPS
Albericio Jorge Gran Rubén Ibáñez Pablo Viñals Víctor Llabería Jose María	ABS: A Low-Cost Adaptive Controller for Prefetching in a Banked Shared Last-Level cache	2012	ACM transaction for Architecture and Code optimization
Armejach A Negi A Cristal A Unsal OS Stenstrom P	Transactional Prefetching: Narrowing the Window of Contention in Hardware Transactional Memory	2012	PACT
Panda Reena V. Gratz Paul Jimenez Daniel	B-Fetch: Branch Prediction Directed Prefetching for In-Order Processors	2012	IEEE Computer Architecture Letters
Lee Jaekyu Kim Hyesoon Vuduc Richard	When Prefetching Works When It Doesn't and Why	2012	ACM Transactions on Architecture and Code Optimization
Jiménez Víctor Gioiosa Roberto Cazorla Francisco J Connell Francis P O	Making Data Prefetch Smarter: Adaptive Prefetching on POWER7 Categories and Subject Descriptors	2012	PACT
Burcea Ioana Soares L Moshovos Andreas	Pointy: a hybrid pointer prefetcher for managed runtime systems	2012	PACT
Natarajan Ragavendra Mekkat Vineeth Hsu Wei-Chung Zhai Antonia	Effectiveness of Compiler-Directed Prefetching on Data Mining Benchmarks	2012	Journal of Circuits Systems and Computers

Banu J Saira	Study on Data Prefetching techniques for Linked Data Structure Applications	2012	IJCSITS
Choi Junchul Oh Hyunok Kim Sungchan Ha Soonhoi	Executing synchronous dataflow graphs on a SPM-based multicore architecture	2012	DAC
Chen Yong Zhu Huaiyu Jin Hui Sun Xian-He	Algorithm-level Feedback-controlled Adaptive data prefetcher: Accelerating data access for high-performance processors	2012	Parallel Computing
Shou Baojiang Hou Xionghui Chen Li	A Compiler-assisted Runtime-prefetching Scheme for Heterogeneous Platforms	2011	PACT
Huang Yan Tang Jie Gu Zhi-min Cai Min Zhang Jianxun Zheng Ninghan	The Performance Optimization of Threaded Prefetching for Linked Data Structures	2011	International Journal of Parallel Programming
Kamruzzaman Md Swanson Steven Tullsen Dean M.	Inter-core prefetching for multicore processors using migrating helper threads	2011	ASPLOS
Ebrahimi Eiman Joo Chang Onur Lee Yale Mutlu	Prefetch-Aware Shared-Resource Management for Multi-Core Systems	2011	ISCA
Guo Yao Narayanan Pritish Member Student Bennaser Mahmoud Abdullah Chheda Saurabh Moritz Csaba Andras	Energy-Efficient Hardware Data Prefetching	2011	Very Large Scale Integration Systems
Manikantan R Govindarajan R Rajan Kaushik	Extended Histories: Improving Regularity and Performance in Correlation Prefetchers Categories and Subject Descriptors	2011	HiPEAC
Erdman Michael Kaynak Cansu Falsafi Babak	Proactive instruction fetch	2011	MICRO
Liu Fang Solihin Yan	Studying the impact of hardware prefetching and bandwidth partitioning in chip-multiprocessors	2011	SIGMETRICS

Manikantan R Govindarajan R	Performance Oriented Prefetching Enhancements Using Commit Stalls	2011	JILP
Juan Fang Hongbo Zhang	A New Technology of Multi-core Prefetching	2011	Procedia Engineering
Aamer Carole-jean Wu Margaret Jaleel Simon Martonosi Jr C Steely Emer Joel	PACMan: Prefetch-Aware Cache Management for high performance caching	2011	MICRO
Wenisch Thomas F Ferdman Michael Ailamaki Anastasia Falsafi Babak Moshovos Andreas	Making Address Correlated Prefetching Practical	2010	IEEE Computer Society
Bhattacharjee Abhishek Martonosi Margaret	Inter-Core Cooperative TLB Prefetchers for Chip Multiprocessors	2010	ASPLOS
Grannaes Marius Jahre Magnus Natvig Lasse	Multi-level hardware prefetching using low complexity delta correlating prediction tables with partial matching	2010	HiPEAC
Lee Jaekyu	Many-Thread Aware Prefetching Mechanisms for GPGPU Applications	2010	MICRO
Diener Matthias Madruga Felipe L Rodrigues Eduardo L Alves Marco a Z Schneider Jörg Navaux Philippe O a Heiss Hans-Ulrich	Evaluating Thread Placement Based on Memory Access Patterns for Multi-core Processors	2010	HPCC
Zhu Huaiyu Chen Yong Sun Xian-he	Timing Local Streams: Improving Timeliness in Data Prefetching	2010	ICS
Chen Yong Zhu Huaiyu Sun Xian-He	An Adaptive Data Prefetcher for High-Performance Processors	2010	CCGRID
Kandemir Mahmut Zhang Yuanrui	Adaptive Prefetching for Shared Cache Based Chip Multiprocessors	2009	DATE
Ebrahimi Eiman Mutlu Onur Lee Chang Joo Patt Yale N.	Coordinated control of multiple Prefetchers in multi-core systems	2009	MICRO
Ebrahimi Eiman Mutlu Onur Patt YN	Techniques for bandwidth-efficient prefetching of linked data structures in hybrid prefetching systems	2009	HPCA

Cui Hanyu Sair Suleyman	Extending data prefetching to cope with context switch misses	2009	IEEE International Conference on Computer Design
Hur Ibrahim Lin Calvin	Feedback mechanisms for improving probabilistic memory prefetching	2009	HPCA
Díaz Pedro Cintra Marcelo	Stream Chaining : Exploiting Multiple Levels of Correlation in Data Prefetching	2009	ISCA
Somogyi Stephen Wenisch Thomas F Ailamaki Anastasia Falsafi Babak	Spatio-Temporal Memory Streaming	2009	ISCA
Lee Chang Joo Narasiman Veynu Mutlu Onur Patt Yale N.	Improving memory bank-level parallelism in the presence of prefetching	2009	MICRO
Liu Gang Huang Zhuo Peri JK Shi Xudong Peng Lu	Enhancement for Accurate Stream Prefetching	2009	JILP
Sharif Ahmad Lee HHS	Data Prefetching Mechanism by Exploiting Global and Local Access Patterns	2009	JILP
Byna Surendra Chen Yong Sun Xian-He	Taxonomy of Data Prefetching for Multicore Processors	2009	Journal of Computer Science and Technology
Lim Chungsoo Byrd Gregory T.	Exploiting producer patterns and L2 cache for timely dependence-based prefetching	2008	IEEE International Conference on Computer Design
Manikantan R Govindarajan R	Focused Prefetching: Performance Oriented Prefetching Based On Commit Stalls	2008	ICS
Erdman Michael Wenisch Thomas F Ailamaki Anastasia Falsafi Babak Moshovos Andreas	Temporal instruction fetch streaming	2008	MICRO
Chen Xi E. Aamodt Tor M.	Hybrid analytical modeling of pending cache hits data prefetching and MSHRs	2008	ISM

Mars Jason Williams Daniel Upton Dan	A reactive unobtrusive prefetcher for multicore and many-core architectures	2008	SHCMP
Byna Surendra Chen Yong Sun Xian-He	A Taxonomy of Data Prefetching Mechanisms	2008	International Symposium on Parallel Architectures Algorithms and Networks
Caragea GC	Data Prefetching on a Many-core Architecture Case study: The XMT Platform	2008	
Trinitis C Weidendorfer J	Off-loading application controlled data prefetching in numerical codes for multi-core processors	2008	High Performance computing and Networking
Lee CJ Mutlu Onur Narasiman Veynu Patt YN	Prefetch-aware DRAM controllers	2008	MICRO
Srinath Santhosh Mutlu Onur Kim Hyesoon Patt Yale N.	Feedback Directed Prefetching: Improving the Performance and Bandwidth-Efficiency of Hardware Prefetchers	2007	HPCA
Salapura Valentina Brunheroto R Red Fernando Gara Alan	Exploiting eDRAM bandwidth with data prefetching: simulation and measurements	2007	ICCD
Alameldeen Alaa R. Wood David a.	Interactions Between Compression and Prefetching in Chip Multiprocessors	2007	HPCA
Chou Yuan	Correlation Prefetching for Commercial Applications	2007	MICRO
Meng Xiandong Chaudhary Vipin	An adaptive data prefetching scheme for bio-sequence database search on reconfigurable platforms	2007	SAC
Sun Xian-He Byna Surendra Chen Yong Byna Surendra Sun Xian-He	Data access history cache and associated data prefetching mechanisms	2007	SC

Zhang Weifeng Tullsen Dean M Calder Brad	Accelerating and Adapting Pre-computation Threads for Efficient Prefetching	2007	HPCA
Ferdman Michael Falsafi Babak	Last-touch correlated data streaming	2007	ISPASS
Romanescu Bogdan F. Bauer Michael E. Sorin Daniel J. Ozev Sule	Reducing the Impact of Process Variability with Prefetching and Criticality-Based Resource Allocation	2007	PACT
Chou Yuan	Low-Cost Epoch-Based Correlation Prefetching for Commercial Applications	2007	MICRO
Yan Jun Zhang Wei	Hybrid multi-core architecture for boosting single-threaded performance	2007	SIGARCH
Al-sukhni Hassan F Holt James C Alsukhni Hassan Holt Jim Com Freescale Connors Daniel A	Improved Stride Prefetching using Extrinsic Stream Characteristics	2006	ISPASS
Cantin Jason F. Lipasti Mikko H. Smith James E.	Stealth prefetching	2006	SIGOPS
Ebrahimi Eiman Mutlu Onur Patt Yale N	Techniques for Bandwidth-Efficient Prefetching of Linked Data Structures in Hybrid Prefetching Systems	2006	HPCA
Solihin Y.	Helper thread prefetching for loosely-coupled multiprocessor systems	2006	Parallel & Distributed Processing Symposium
Shi Xudong Yang Zhen Peir Jih-kwon Peng Lu Chen Yen-kuang Lee Victor Liang Bob Clara Santa	Coterminous Locality and Coterminous Group Data Prefetching	2006	IPDPS
Ramos Luis M Briz José Luis Ibáñez Pablo E Viñals Victor	Data prefetching in a cache hierarchy with high bandwidth and capacity	2006	MEDEA

Gendler Alexander Mendelson Avi Birk Yitzhak	A PAB-Based Multi-Prefetcher Mechanism	2006	International Journal of Parallel Programming
Somogyi Stephen Wenisch Thomas F Ailamaki Anastassia Falsafi Babak Moshovos Andreas	Spatial Memory Streaming	2006	ISCA
Hur Ibrahim Lin Calvin	Memory prefetching using adaptive stream detection	2006	MICRO
Ganusov I. Burtscher M.	Future execution: a hardware prefetching technique for chip multiprocessors	2005	PACT
Brunheroto R Salapura Valentina Red Fernando F Hoenicke Dirk Gara Alan	Data cache prefetching design space exploration for BlueGene / L supercomputer	2005	SBAC-PAD
Papathanasiou Athanasios E Scott Michael L	Aggressive Prefetching: An Idea Whose Time Has Come	2005	HotOS
Emma P. G. Hartstein A. Puzak T. R. Srinivasan V.	Exploring the limits of prefetching	2005	IBM Journal of Research and Development
Falc Ayose Ramirez Alex	Effective Instruction Prefetching via Fetch Pre-staging	2005	IPDPS
Naser M.B. Moritz C.a.	PARE: a power-aware hardware data prefetching engine	2005	ISLPED
Puzak Thomas R. Hartstein A. Emma P. G. Srinivasan V.	When prefetching improves/degrades performance	2005	CF
Viji Srinivasan Edward S Davidson Gary S Tyson	A Prefetch Taxonomy	2004	TC
Nesbit KJ Smith JE	Data cache prefetching using a global history buffer	2004	HPCA
Chheda S. Koren I. Krishna C.M. Moritz C.a.	Energy characterization of hardware-based data prefetching	2004	ICCD

Nesbit KJ Dhodapkar AS Smith JE	AC/DC: An adaptive data cache prefetcher	2004	PACT
Ian Hassan Al-sukhni Daniel Bratt	Compiler-Directed Content-Aware Prefetching for Dynamic Data Structures	2003	PACT
Burger D. McKinley K.S. Reinhardt S.K. Weems C.C.	Guided region prefetching: a cooperative hardware/software approach	2003	ISCA
Zhang Youtao Gupta Rajiv	Enabling Partial Cache Line Prefetching	2003	ICPP
Annavaram Murali Patel Jignesh M. Davidson Edward S.	Call graph prefetching for database applications	2003	ACM Transactions on Computer Systems
Solihin Yan Lee Jaejin Torrellas Josep Member Senior	Correlation Prefetching with a User-Level Memory Thread	2003	IEEE Transactions on Parallel and Distributed System
Zhou Huiyang Conte Thomas M	Enhancing Memory Level Parallelism via Recovery-Free Value Prediction	2003	ICS
Mutlu O. Stark J. Wilkerson C. Patt Y.N.	Run-ahead execution: an alternative to very large instruction windows for out-of-order processors	2003	HPCA
Doshi Punit R Rundensteiner Elke A Ward Matthew O	Prefetching for Visual Data Exploration	2002	IRIS
Zhang Yi Haga Steve Barua Rajeev	Execution history guided instruction prefetching	2002	ICS
Peir Jih-Kwon Lai Shih-Chang Lu Shih-Lien Stark Jared Lai Konrad	Bloom filtering cache misses for accurate data speculation and prefetching	2002	ICS
Luk Chi-Keung Muth Robert Patil Harish Weiss Richard Lowney P. Geoffrey Cohn Robert	Profile-guided post-link stride prefetching	2002	ICS

Collins Jamison Calder Brad Tullsen Dean M	Pointer Cache Assisted Prefetching	2002	MICRO
Cooksey Robert Jourdan Stephan Grunwald Dirk	A stateless content-directed data prefetching mechanism	2002	ACM SIGPLAN Notices
Palem K.V.	A framework for data prefetching using off-line training of Markovian predictors	2002	Proceedings. IEEE International Conference on Computer Design: VLSI in Computers and Processors
Kandiraju G.B. Sivasubramaniam A.	Going the distance for TLB prefetching: an application-driven study	2002	ISCA
Y Zhigang Hu Y Margaret Martonosi	Timekeeping in the Memory System: Predicting and Optimizing Memory Behavior	2002	ISCA
Speight Evan Burtscher Martin	Delphi: Prediction-based page prefetching to improve the performance of shared virtual memory systems	2002	
Kim Jinwoo Rabbah Rodric M Palem Krishna V Wong Weng-fai	Adaptive Compiler Directed Prefetching for EPIC Processors	2002	CREST Technical Report
Chilimbi Trishul M. Hirzel Martin	Dynamic hot data stream prefetching for general-purpose programs	2002	PLDI
Liao Steve S Wang Perry H Wang Hong C Gerolf Hoflehner C Daniel Lavery Shen John P	Post-Pass Binary Adaptation for Software-Based Speculative Pre-computation	2002	PLDI
Fide C. Falsafi B.	Dead-block prediction & dead-block correlating prefetchers	2001	ISCA
Srinivasan Viji Davidson Edward S Tyson Gary S Arbor Ann Charney Mark J Puzak Thomas R	Branch History Guided Instruction Prefetching	2001	HPCA
Annavaram M. Patel J.M. Davidson E.S.	Data prefetching by dependence graph pre-computation	2001	ISCA

Collins Jamison D Wang Hong Tullsen Dean M Hughes Christopher Lee Yong-fong Lavery Dan Shen John P	Speculative Pre-computation: Long-range Prefetching of Delinquent Loads	2001	ISCA
Goeman B. Vandierendonck H. de Bosschere K.	Differential FCM: increasing value prediction accuracy by improving table usage efficiency	2001	HPCA
Collins JD Tullsen DM	Dynamic speculative pre-computation	2001	MICRO
Zilles C. Sohi G.	Execution-based prediction using speculative slices	2001	ISCA
Moshovos Andreas	Slice-Processors: An Implementation of Operation-Based Prediction	2001	Proceedings of Intl. Conference on Supercomputing
Luk Chi-keung	Tolerating Memory Latency through Software-Controlled Pre-Execution in Simultaneous Multithreading Processors	2001	ISCA
Koppelman David M	Neighborhood Prefetching on Multiprocessors Using Instruction History	2000	PACT
Zhang Chengqiang McKee Sally a.	Hardware-only stream prefetching and dynamic access ordering	2000	ICS
Sherwood T. Sair S. Calder B.	Predictor-directed stream buffers	2000	MICRO
Roth a. Sohi G.S.	Effective jump-pointer prefetching for linked data structures	1999	ISCA
Srinivasan Viji Tyson Gary S Davidson Edward	A Static Filter for Reducing Prefetch Traffic	1999	Tech Report
Reinman Glenn Calder Brad Austin Todd Diego San	Fetch Directed Instruction Prefetching	1999	MICRO
Bartels G Karlin Anna Anderson Darrell	Potentials and limitations of fault-based markov prefetching for virtual memory pages	1999	SIGMETRICS

Chi Chi-Hung Yuan Jun-Li Cheung Chin-Ming	Cyclic dependence based data reference prediction	1999	ICS
Joseph Doug Grmnwald Dirk	Prefetching using Markov Predictors	1999	ISCA
Voelker Geoffrey M Anderson Eric J Kimbrel Tracy Feeley Michael J Chase Jeffrey S Karlin Anna R Levy Henry M	Implementing Cooperative Prefetching and Caching in a Globally-Managed Memory System	1998	SIGMETRICS
Chi Chi-Hung Cheung Chin-Ming	Hardware-driven prefetching for pointer data references	1998	ICS
Koufaty David	Comparing Data Forwarding and Prefetching for Communication-Induced Misses in Shared-Memory MPs	1998	ICS
Roth Amir Moshovos Andreas Sohi Gurindar S.	Dependence based prefetching for linked data structures	1998	ASPLOS
Vanderwiel Steven Paul	Masking Memory Access Latency with a Compiler-Assisted Data Prefetch Controller	1998	Doctoral Thesis Minnesota University
Tomkins Andrew Patterson R. Hugo Gibson Garth	Informed multi-process prefetching and caching	1997	SIGMETRICS
Dundas James Mudge Trevor	Improving data cache performance by pre-executing instructions under a cache miss	1997	ICS
Dahlgren Fredrik Society I Computer	Evaluation of Hardware-Based Stride and Sequential Prefetching in Shared-Memory Multiprocessors	1996	IEEE Transaction on Parallel and Distributed Systems
Trancoso P. Torrellas J.	The impact of speeding up critical sections with data prefetching and forwarding	1996	ICPP Workshop on Challenges for Parallel Processing
Pierce J. Mudge T.	Wrong-path instruction prefetching	1996	MICRO
Lim Beng-Hong Bianchini Ricardo	Limits on the performance benefits of multithreading and prefetching	1996	SIGMETRICS

Vanderwiel Steve Lilja David J Vanderwiel Steven	A Survey of Data Prefetching Techniques A Survey of Data Prefetching Techniques	1996	HPPC
Cao Pei Felten Edward W. Karlin Anna R. Li Kai	A study of integrated prefetching and caching strategies	1995	SIGMETRICS
Tullsen Dean M. Eggers Susan J.	Effective cache prefetching on bus-based multiprocessors	1995	ACM Transactions on Computer Systems
Dahlgren Fredrik	Sequential Hardware Prefetching	1995	IEEE Transaction on Parallel and Distributed Systems
Tien-Fu Chen Jean-Loup Baer	Effective hardware based data prefetching for high performance processor	1995	IEEE Transactions on Computers
Zhang Zheng Josep Torrellas	Speeding up Multiprocessors: Irregular Memory Applications Binding in and Shared-Memory Group Prefetching	1995	ISCA
Krishnan P Vitter JS	Optimal prediction for prefetching in the worst case	1994	Proceedings of the fifth annual ACM-SIAM
Palacharla Subbarao	Evaluating Stream Buffers as a Secondary Cache Replacement	1994	ISCA
Tullsen Dean M. Eggers Susan J.	Limitations of cache prefetching on a bus-based multiprocessor	1993	ISCA
Fu John W C Pate Janak H Janssens Bob L	Stride Directed Prefetching in Scalar Processors	1992	MICRO