References

- J. Gantz and D. Reinsel, "Big Data, Bigger Digital Shadows, and Biggest Growth in the Far East," *IDC iView*, Dec. 2012. [Online]. Available: http://idcdocserv. com/1414.
- [2] A. Demers, J. Gehrke, M. Hong, M. Riedewald, and W. White, "Towards expressive publish/subscribe systems," in *Proceedings of the 10th International Conference on Advances in Database Technology*, ser. EDBT'06, Munich, Germany: Springer-Verlag, 2006, pp. 627–644.
- [3] N. P. Schultz-Møller, M. Migliavacca, and P. Pietzuch, "Distributed complex event processing with query rewriting," in *Proceedings of the* 3rd ACM International Conference on Distributed Event-Based Systems, ACM, 2009, p. 4.
- [4] F. Wang and P. Liu, "Temporal management of RFID data," in Proceedings of the 31st international conference on Very large data bases, VLDB Endowment, 2005, pp. 1128-1439-ersity of Moratuwa, Sri Lanka.
- [5] Y. Simuhan, ElePtasania, TheAnan, DiNstanajan W. Yin, and Q. Zhou, "Toward data-driven demand-response optimization in a campus microgrid," in Proceedings of the 3rd ACM Workshop on Embedded Sensing Systems for Energy-Efficiency in Buildings, ACM, 2011, pp. 41–42.
- [6] D. Luckham and R. Schulte, *Event Processing Glossary Version 2.0.* Event Processing Technical Society, Jul. 2011.
- [7] G. Cugola and A. Margara, "Processing flows of information: From data stream to complex event processing," ACM Computing Surveys (CSUR), vol. 44, no. 3, p. 15, 2012.
- [8] A. Adi, D. Botzer, G. Nechushtai, and G. Sharon, "Complex Event Processing for Financial Services," in *IEEE Services Computing Workshops*, 2006, Sep. 2006, pp. 7–12.
- [9] D. Abadi, D. Carney, U. Cetintemel, M. Cherniack, C. Convey, C. Erwin, E. Galvez, M. Hatoun, A. Maskey, and A. Rasin, "Aurora: a data stream management system," in *Proceedings of the 2003 ACM SIGMOD international* conference on Management of data, 2003, pp. 666–666.
- [10] M. Cammert, C. Heinz, J. Krämer, A. Markowetz, and B. Seeger, "Pipes: a multithreaded publish-subscribe architecture for continuous queries over streaming data sources," *Department of Mathematics and Computer Science, University* of Marburg, 2003.

- [11] A. Arasu, B. Babcock, S. Babu, J. Cieslewicz, M. Datar, K. Ito, R. Motwani, U. Srivastava, and J. Widom, "STREAM: The Stanford Data Stream Management System," Stanford InfoLab, Technical Report 2004-20, 2004. [Online]. Available: http://ilpubs.stanford.edu:8090/641/.
- [12] D. J. Abadi, Y. Ahmad, M. Balazinska, U. Cetintemel, M. Cherniack, J.-H. Hwang, W. Lindner, A. Maskey, A. Rasin, and E. Ryvkina, "The design of the borealis stream processing engine.," in *CIDR*, vol. 5, 2005, pp. 277–289.
- [13] EsperTech, Event Stream Intelligence: Esper and NEsper, http://esper. codehaus.org/, [Online; accessed 10-Sept-2013], 2013.
- [14] Oracle Product Management and Development Team, "Oracle Complex Event Processing: Lightweight Modular Application Event Processing in the Real World," Oracle Corporation, Technical Report, Jun. 2009. [Online]. Available: http://www.oracle.com/technetwork/middleware/complex-eventprocessing/overview/index.html.
- [15] TIBCO StreamBase, http://www.streambase.com/, [Online; accessed 10-Sept-2013], 2013.
- [16] B. Satzger, W. Hummer, P. Leitner, and S. Dustdar, "Esc: towards an elastic stream computing platform for the cloud," in *Proceedings of the 2011 IEEE International Conference on Cloud Computing (CLOUD)*, 2011, pp. 348–355.
- [17] G. Cugola and A. Margara, "Complex Event Processing with T-REX," Journal of Systems and Software, vol. 85, no. 8, pp. 1709–1728, Aug. 2012, ISSN: 0164-1212.
- [18] M. Hirzel, "Partition and Compose: Parallel Complex, Event Processing," in Proceedings of the 6th ACM International Conference on Distributed Event-Based Systems Ser. DEBS 112, Berlin, Cornary DiSM, 120120 pp. 191–200, ISBN: 978-1-4503-1315-5. WWW.lib.mrt.ac.lk
- [19] G. Sharon and O. Etzion, "Event Processing Network-A Conceptual Model," PhD thesis, Technion-Israel Institute of Technology, Faculty of Industrial and Management Engineering, 2007.
- [20] S. Suhothayan, K. Gajasinghe, I. Loku Narangoda, S. Chaturanga, S. Perera, and V. Nanayakkara, "Siddhi: a second look at complex event processing architectures," in *Proceedings of the 2011 ACM workshop on Gateway computing environments*, ACM, 2011, pp. 43–50.
- [21] WSO2 Inc., WSO2 Complex Event Processor, http://wso2.com/products/ complex-event-processor, [Online; accessed 10-Sept-2013], 2013.
- [22] J. D. Owens, M. Houston, D. Luebke, S. Green, J. E. Stone, and J. C. Phillips, "GPU Computing," *Proceedings of the IEEE*, vol. 96, no. 5, pp. 879–899, 2008.
- [23] J. Nickolls, I. Buck, M. Garland, and K. Skadron, "Scalable Parallel Programming with CUDA," Queue, vol. 6, no. 2, pp. 40–53, Mar. 2008, ISSN: 1542-7730.
- [24] K. Fatahalian and M. Houston, "A closer look at GPUs," Commun. ACM, vol. 51, no. 10, pp. 50–57, Oct. 2008.
- [25] M. R. Mendes, P. Bizarro, and P. Marques, "A performance study of event processing systems," in *Performance Evaluation and Benchmarking*, Springer, 2009, pp. 221–236.

- [26] G. Cugola and A. Margara, "Low latency complex event processing on parallel hardware," *Journal of Parallel and Distributed Computing*, vol. 72, no. 2, pp. 205–218, 2012.
- [27] S. Schneidert, H. Andrade, B. Gedik, K.-L. Wu, and D. S. Nikolopoulos, "Evaluation of streaming aggregation on parallel hardware architectures," in *Proceedings of the 4th ACM International Conference on Distributed Event-Based* Systems, ACM, 2010, pp. 248–257.
- [28] A. Margara and G. Cugola, "High performance content-based matching using GPUs," in *Proceedings of the 5th ACM international conference on Distributed* event-based system, ACM, 2011, pp. 183–194.
- [29] O. Etzion and P. Niblett, Event Processing in Action, 1st. Greenwich, CT, USA: Manning Publications Co., 2010, ISBN: 1935182218, 9781935182214.
- [30] G. Cugola and A. Margara, "TESLA: A Formally Defined Event Specification Language," in *Proceedings of the 4th ACM International Conference on Distributed Event-Based Systems*, ser. DEBS '10, Cambridge, United Kingdom: ACM, 2010, pp. 50–61.
- [31] B. Babcock, S. Babu, M. Datar, R. Motwani, and J. Widom, "Models and Issues in Data Stream Systems," in *Proceedings of the 21st ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems*, ser. PODS '02, Madison, Wisconsin: ACM, 2002, pp. 1–16.
- [32] D. C. Luckham, The Power of Events: An Introduction to Complex Event Processing in Distributed Enterprise Systems. Boston, MA, USA: Addison-Wesley Longman Publishing Col, Line, 2000, ISBN 020 572789711ka.
- [33] T. Bass What is Complex Elens Processing South 10 Now . the complex complex Elens Processing South 10 Now . the complex of the comple
- [34] D. S. Rosenblum and A. L. Wolf, "A Design Framework for Internet-scale Event Observation and Notification," in *Proceedings of the 6th European* SOFTWARE ENGINEERING Conference Held Jointly with the 5th ACM SIGSOFT International Symposium on Foundations of Software Engineering, ser. ESEC '97/FSE-5, Zurich, Switzerland: Springer-Verlag New York, Inc., 1997, pp. 344–360.
- [35] P. T. Eugster, P. A. Felber, R. Guerraoui, and A.-M. Kermarrec, "The Many Faces of Publish/Subscribe," ACM Comput. Surv., vol. 35, no. 2, pp. 114–131, Jun. 2003.
- [36] M. K. Aguilera, R. E. Strom, D. C. Sturman, M. Astley, and T. D. Chandra, "Matching Events in a Content-based Subscription System," in *Proceedings of the 18th Annual ACM Symposium on Principles of Distributed Computing*, ser. PODC '99, Atlanta, Georgia, USA: ACM, 1999, pp. 53–61.
- [37] R. R. Schaller, "Moore's law: past, present and future," Spectrum, IEEE, vol. 34, no. 6, pp. 52–59, 1997.
- [38] M. Flynn, "Some computer organizations and their effectiveness," *IEEE Transactions on Computers*, vol. 100, no. 9, pp. 948–960, 1972.

- [39] L. Seiler, D. Carmean, E. Sprangle, T. Forsyth, M. Abrash, P. Dubey, S. Junkins, A. Lake, J. Sugerman, and R. Cavin, "Larrabee: a many-core x86 architecture for visual computing," in *Proceedings of the ACM Transactions on Graphics (TOG)*, ACM, vol. 27, 2008, p. 18.
- [40] T. Chen, R. Raghavan, J. N. Dale, and E. Iwata, "Cell broadband engine architecture and its first implementation—a performance view," *IBM Journal* of Research and Development, vol. 51, no. 5, pp. 559–572, 2007.
- [41] M. Gschwind, "The Cell Broadband Engine: exploiting multiple levels of parallelism in a chip multiprocessor," *International Journal of Parallel Programming*, vol. 35, no. 3, pp. 233–262, 2007.
- [42] U. J. Kapasi, W. J. Dally, S. Rixner, J. D. Owens, and B. Khailany, "The Imagine Stream Processor," in *Proceedings of the 2002 IEEE International Conference on Computer Design: VLSI in Computers and Processors*, IEEE, 2002, pp. 282–288.
- [43] D. Kirk, "NVIDIA CUDA software and GPU parallel computing architecture," in *ISMM*, vol. 7, 2007, pp. 103–104.
- [44] S. Venkatasubramanian, "The graphics card as a stream computer," in SIGMOD-DIMACS workshop on management and processing of data streams, vol. 101, 2003, p. 102.
- [45] J. E. Stone, D. Gohara, and G. Shi, "OpenCL: A parallel programming standard for heterogeneous computing systems," *Computing in science & engineering*, vol. 12, no. 3, p. 66, 2010.
- [46] P. C. Pratt-Szeliga, J. W. Fawcett, and R. D. Welch, "Rootbeer: Seamlessly using GPUs from Java," in Proceedings of the IEEE 14th International Conference on High Performance Communication and IEEE 9th International Conference on Embedded Software and Systems (HPCC-ICESS), IEEE, 2012, pp. 375-380.
- [47] G. Dotzler, R. Veldema, and M. Klemm, "JCudaMP: OpenMP/Java on CUDA," in Proceedings of the 3rd International Workshop on Multicore Software Engineering, ACM, 2010, pp. 10–17.
- [48] P. Calvert, "Parallelisation of java for graphics processors," Part II Dissertation, Computer Science Tripos, University of Cambridge, 2010.
- [49] Y. Yan, M. Grossman, and V. Sarkar, "JCUDA: A Programmer-Friendly Interface for Accelerating Java Programs with CUDA," in *Euro-Par 2009 Parallel Processing*, ser. Lecture Notes in Computer Science, H. Sips, D. Epema, and H.-X. Lin, Eds., vol. 5704, Springer Berlin Heidelberg, 2009, pp. 887–899.
- [50] jcuda.org, JCuda, http://www.jcuda.org/, [Online; accessed 10-December-2013], 2009.
- [51] Hoopoe, jCUDA, http://www.cass-hpc.com/category/jcuda, [Online; accessed 16-March-2014], 2009.
- [52] JaCuda, http://sourceforge.net/projects/jacuda/, [Online; accessed 16-March-2014], 2008.
- [53] jacuzzi, http://sourceforge.net/projects/jacuzzi, [Online; accessed 16-March-2014], 2008.
- [54] J. Strnad, "Java on CUDA architecture," 2012.

- [55] K. Karimi, N. G. Dickson, and F. Hamze, "A performance comparison of CUDA and OpenCL," arXiv preprint arXiv:1005.2581, 2010.
- [56] Z. Wang, P. Lv, and C. Zheng, "CUDA on Hadoop: A Mixed Computing Framework for Massive Data Processing," in *Foundations and Practical Applications of Cognitive Systems and Information Processing*, Springer, 2014, pp. 253–260.
- [57] D. Chen and H. Peng, "Cuda performance study on hadoop mapreduce clusters,"
- [58] OpenJDK Project Sumatra, http://openjdk.java.net/projects/sumatra/,[Online; accessed 16-March-2014], 2012.
- [59] S. Gupta, GPU Acceleration Coming to Java, Says IBM Exec, http://blogs. nvidia.com/blog/2013/09/22/gpu-coming-to-java/, [Online; accessed 16-March-2014], Sep. 2013.
- [60] W. Zaremba, Y. Lin, and V. Grover, "Jabee: framework for object-oriented java bytecode compilation and execution on graphics processor units," in *Proceedings* of the 5th Annual Workshop on General Purpose Processing with Graphics Processing Units, ACM, 2012, pp. 74–83.
- [61] Java bindings for OpenCL, http://jocl.org/, [Online; accessed 16-March-2014], 2009.
- [62] OpenCL bindings for Java, https://code.google.com/p/javacl/, [Online; accessed 16-March-2014], 2010.
- [63] APARAPI: A Parallel API, http://developer.amd.com/tools-and-sdks/ heterogeneous-computing/aparapi, [Online; accessed 16-March-2014], 2011.
- [64] L. Baungärtner, P. Graubner, M. Lemweber, R. Schwarzkopf, M. Schmidt, B. Seeger, and BCIFFEISISberhe Mastering Sectifity Othomalies in Virtualized Computing Environments via Complex Event Processing," in The 4th International Conference on Information, Process, and Knowledge Management, (eKNOW 2012), 2012, pp. 76–81.
- [65] C.-H. Lin, C.-H. Liu, L.-S. Chien, and S.-C. Chang, "Accelerating Pattern Matching Using a Novel Parallel Algorithm on GPUs," *IEEE Transactions on Computers*, vol. 62, no. 10, pp. 1906–1916, 2013.
- [66] A. Carzaniga and A. L. Wolf, "Forwarding in a content-based network," in Proceedings of the 2003 conference on Applications, technologies, architectures, and protocols for computer communications, ACM, 2003, pp. 163–174.
- [67] A. Farroukh, E. Ferzli, N. Tajuddin, and H.-A. Jacobsen, "Parallel Event Processing for Content-based Publish/Subscribe Systems," in *Proceedings of the* 3rd ACM International Conference on Distributed Event-Based Systems, ser. DEBS '09, New York, NY, USA: ACM, 2009, 8:1–8:4.
- [68] M. Sadoghi, H. Singh, and H.-A. Jacobsen, "Towards highly parallel event processing through reconfigurable hardware," in *Proceedings of the 7th International Workshop on Data Management on New Hardware*, ACM, 2011, pp. 27–32.
- [69] H. Inoue, T. Takenaka, and M. Motomura, "20Gbps C-Based Complex Event Processing," in *Proceedings of the 2011 21st International Conference on Field Programmable Logic and Applications*, ser. FPL '11, Washington, DC, USA: IEEE Computer Society, 2011, pp. 97–102.

- [70] L. Woods, J. Teubner, and G. Alonso, "Complex Event Detection at Wire Speed with FPGAs," Proc. VLDB Endow., vol. 3, no. 1-2, pp. 660–669, Sep. 2010.
- [71] M. Sadoghi, M. Labrecque, H. Singh, W. Shum, and H.-A. Jacobsen, "Efficient Event Processing Through Reconfigurable Hardware for Algorithmic Trading," *Proc. VLDB Endow.*, vol. 3, no. 1-2, pp. 1525–1528, Sep. 2010.
- [72] M. Thompson, D. Farley, M. Barker, P. Gee, and A. Stewart, "Disruptor: High performance alternative to bounded queues for exchanging data between concurrent threads," *Technical paper. LMAX, May*, p. 206, 2011.
- [73] JavaCPP, Samuel Audet, https://github.com/bytedeco/javacpp, [Online; accessed 10-January-2015], 2012.
- [74] Event Processing Technical Society, http://en.wikipedia.org/wiki/Event_ Processing_Technical_Society/, [Online; accessed 16-January-2015], 2015.



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