[15] S. Labes, J. Repschlager, R. Zarnekow, A. Stanik and O. Kao, "Standardization approaches within cloud computing: evaluation of infrastructure as a service architecture," *In Computer Science and Information Systems (FedCSIS), 2012 Federated Conference on*, pp. 923-930, September 2012.
[16] T. Cordeiro, D. Damalio, N. Pereira, P. Endo, A. Palhares, G. Gonçalves, D. Sadok et al., "Open source cloud computing platforms," *In Grid and Cooperative Computing (GCC), 2010 9th International Conference on*, pp. 366-371, November 2010.
[17] L. Benini, A. Bogliolo and G. D. Micheli, "A survey of design techniques for system-level dynamic power management," *Very Large Scale Integration (VLSI) Systems, IEEE Transactions on* 8, no. 3, pp. 299-316, 2000.
[18] R. Jejurikar, C. Pereira and R. Gupta, "Leakage aware dynamic voltage scaling for real-time embedded systems," In *Proceedings of the 41st annual Design Automation Conference*, pp. 275-280, June 2004.
[19] S. Kuribayashi, "Reducing total power consumption method in cloud computing environments," *International Journal of Computer Networks & Communications (IJCNC)* vol.4, no.2, March 2012.
[20] I. S. Moreno and J. Xu, "Energy-efficiency in cloud computing environments: towards energy savings without Performance degradation." *International Journal of Cloud Applications and Computing (IJCAC)* vol.1, no. 1, pp. 17-33, January 2011.
[21] S. K. Garg and R. Buyya, "Green cloud computing and environmental sustainability," *Harnessing Green IT: Principles and Practices,* 1st ed. John Wiley & Sons, Ltd. 2012, pp. 315-340.
[22] M. Armbrust, A. Fox, R. Griffith, A. D. Joseph, R. Katz, A. Konwinski, G. Lee et al. "A view of cloud computing." *Communications of the ACM* vol. 53, no. 4, pp. 50-58, April 2010.
[23] N. J. Kansal and I. Chana. "Cloud load balancing techniques: A step towards green computing." *IJCSI International Journal of Computer Science* vol. 9, no. 1, pp. 238-246, January 2012.
[24] Y. C. Lee and A. Y. Zomaya, "Energy efficient utilization of resources in cloud computing systems." *The Journal of Supercomputing* vol. 60, no. 2, pp. 268-280, March 2012.
[25] R. Brown, "Report to congress on server and data center energy efficiency: Public Law. 109-431," Lawrence Berkeley National Laboratory, pp. 1-137, June 2008.
[26] E. Gelenbe and R. Lent. "Optimising server energy consumption and response time," *Theoretical and Applied Informatics*, vol. 24, no. 4, pp. 257-270, 2012.
[27] A. Beloglazov and R. Buyya, "Energy efficient resource management in virtualized cloud data centers," *In Proceedings of the 2010 10th IEEE/ACM International Conference on Cluster, Cloud and Grid Computing*, IEEE Computer Society, pp. 826-831, May 2010.
[28] T. A. AlEnawy and H. Aydin, "Energy-aware task allocation for rate monotonic scheduling," *In Real Time and Embedded Technology and Applications Symposium*, no. 11, pp. 213-223, 2005.
[29] P. Pillai and K. G. Shin, "Real-time dynamic voltage scaling for low-power embedded operating systems." *In ACM SIGOPS Operating Systems Review*, vol. 35, no. 5, pp. 89-102, December 2001.
[30] H. Aydin and Q. Yang, "Energy-aware partitioning for multiprocessor real-time systems." In *Parallel and Distributed Processing Symposium, 2003.* Proceedings. International, pp. 9-pp. IEEE, 2003.
[31] Y. Liu and A. K. Mok, "An integrated approach for applying dynamic voltage scaling to hard real-time systems." *In Real-Time and Embedded Technology and Applications Symposium, 2003*. Proceedings. The 9th IEEE, pp. 116-123. IEEE, 2003.
[32] H. Aydin, R. Melhem, D. Mossé, and P. M. Alvarez, "Power-aware scheduling for periodic real-time tasks," *Computers, IEEE Transactions on* 53, no. 5, pp. 584-600, 2004.
[33] M. Mezmaz, N. Melab, Y. Kessaci, Y. C. Lee, E-G. Talbi, A. Y. Zomaya, and D. Tuyttens, "A parallel bi-objective hybrid metaheuristic for energy-aware scheduling for cloud computing systems."*Journal of Parallel and Distributed Computing*, vol. 71, no. 11, pp. 1497-1508, November 2011.
[34] C. M. Wu, R. S. Chang and H. Y. Chan, "A green energy-efficient scheduling algorithm using DVFS technique for cloud datacenters," *Future Generation Computer Systems*, pp. 1-21, 2013. Available: http://dx.doi.org/10.1016/j.future.2013.06.009
[35] S. Yassa, R. Chelouah, H. Kadima and B. Granado, "Multi-objective approach for energy-aware workflow scheduling in cloud computing environments," *The Scientific World Journal*, vol. 2013, pp. 1-13, September 2013.
[36] A. Beloglazov and R. Buyya, "Energy efficient resource management in virtualized cloud data centers," *Proceedings of the 2010 10th IEEE/ACM International Conference on Cluster, Cloud and Grid Computing, IEEE Computer Society*, pp. 826-831, May 2010.
[37] Y. Jin, Y. Wen and Q. Chen, "Energy efficiency and server virtualization in data centers: An empirical investigation," In *Computer Communications Workshops (INFOCOM WKSHPS), 2012 IEEE Conference on*, pp. 133-138, IEEE, March 2012.
[38] S. K. Garg, C. S. Yeo and R. Buyya, "Green cloud framework for improving carbon efficiency of clouds." In *Euro-Par 2011 Parallel Processing*, pp. 491-502. Springer Berlin Heidelberg, 2011.
[39] L. Liu, H. Wang, X. Liu, X. Jin, W. B. He, Q. B. Wang and Y. Chen, "GreenCloud: a new architecture for green data center." In *Proceedings of the 6th international conference industry session on Autonomic computing and communications industry session*, pp. 29-38. ACM, June 2009.
[40] L. Lefèvre and A. C. Orgerie, "Designing and evaluating an energy efficient cloud." *The Journal of Supercomputing*, vol. 51, no. 3, pp. 352-373, 2010.
[41] A. Uchechukwu, K. Li and Y. Shen, "Improving cloud computing energy efficiency." In *Cloud Computing*

Congress (APCloudCC), 2012 IEEE Asia Pacific, pp. 53-58. IEEE, November 2012.

[42] B. Yamini and D. V. Selvi, "Cloud virtualization: A potential way to reduce global warming." In *Recent Advances in Space Technology Services and Climate Change (RSTSCC), 2010*, pp. 55-57. IEEE, November 2010.

[43] E. Pakbaznia, M. Ghasemazar and M. Pedram, "Temperature-aware dynamic resource provisioning in a power-optimized datacenter." In *Proceedings of the Conference on Design, Automation and Test in Europe*, pp. 124-129. European Design and Automation Association, March 2010.

[44] C. D. Patel, R. Sharma, C. E. Bash and A. Beitelmal, "Thermal considerations in cooling large scale high compute density data centers." In *Thermal and Thermomechanical Phenomena in Electronic Systems, 2002. ITHERM 2002. The Eighth Intersociety Conference on*, pp. 767-776. IEEE, 2002.

[45] R. K. Sharma, C. E. Bash, C. D. Patel, R. J. Friedrich and J. S. Chase, "Balance of power: Dynamic thermal management for internet data centers." *Internet Computing, IEEE*, vol. 9, no. 1, pp. 42-49, 2005.

[46] J. D. Moore, J. S. Chase, P. Ranganathan and R. K. Sharma, "Making Scheduling" Cool: Temperature-Aware Workload Placement in Data Centers." In *USENIX annual technical conference, General Track*, pp. 61-75, April 2005.

[47] J. Li, Z. Li, K. Ren and X. Liu, "Towards optimal electric demand management for internet data centers," *Smart Grid, IEEE Transactions on*, vol. 3, no. 1, pp. 183-192, February 2012.

[48] I. Rodero, H. Viswanathan, E. K. Lee, M. Gamell, D. Pompili and M. Parashar, "Energy-efficient thermal-aware autonomic management of virtualized hpc cloud infrastructure." *Journal of Grid Computing*, vol. 10, no. 3, pp. 447-473, July 2012.

[49] T. Mukherjee, A. Banerjee, G. Varsamopoulos, S. K. S. Gupta and S. Rungta, "Spatio-temporal thermal-aware job scheduling to minimize energy consumption in virtualized heterogeneous data centers," *Computer Networks*, vol.53, no. 17, pp. 2888-2904, December 2009.

[50] T. Heath, A. P. Centeno, P. George, L. Ramos, Y. Jaluria and R. Bianchini, "Mercury and freon: temperature emulation and management for server systems," In *ACM SIGARCH Computer Architecture News*, vol. 34, no. 5, pp. 106-116. ACM, October 2006.

[51] Q. Tang, S. K. S. Gupta and G. Varsamopoulos, "Energy-efficient thermal-aware task scheduling for homogeneous high-performance computing data centers: A cyber-physical approach," *Parallel and Distributed Systems, IEEE Transactions*, vol. 19, no. 11, pp. 1458-1472, October 2008.

[52] T. V. T. Duy, Y. Sato and Y. Inoguchi, "Performance evaluation of a green scheduling algorithm for energy savings in cloud computing," In *Parallel & Distributed Processing, Workshops and Phd Forum (IPDPSW), 2010 IEEE International Symposium on*, pp. 1-8. IEEE, April 2010.

[53] J. Prevost, K. Nagothu, B. Kelley and M. Jamshidi, "Prediction of cloud data center networks loads using stochastic and neural models," *in System of Systems Engineering (SoSE), 2011 6th International Conference on*, pp. 276-281, June 2011.

[54] N. M. A. Sallami, A. A. Daoud and S. A. A. Alousi, "Load Balancing with Neural Network." *(IJACSA) International Journal of Advanced Computer Science and Applications*, vol.4, no. 10, pp. 138-145, 2013.

[55] Y. Fang, F. Wang and J. Ge, "A task scheduling algorithm based on load balancing in cloud computing," In *Web Information Systems and Mining*, pp. 271-277. Springer Berlin Heidelberg, 2010.

[56] L. M. Zhang, K. Li and Y. Q. Zhang, "Green task scheduling algorithms with speeds optimization on heterogeneous cloud servers," In*Proceedings of the 2010 IEEE/ACM Int'l Conference on Green Computing and Communications & Int'l Conference on Cyber, Physical and Social Computing*, pp. 76-80. IEEE Computer Society, December 2010.

[57] W. Li, G. Xu, J. Zhao, X. Fu, Y. Dong, Y. Zhai and W. Dan, "Task Scheduling Strategy Based on Tree Network in Cloud Computing Environment," In *International Conference on Mechanical Engineering and Technology (ICMET-London 2011)*. ASME Press, 2011.

[58] J. Dean and S. Ghemawat, "MapReduce: simplified data processing on large clusters," *Communications of the ACM*, vol. 51, no. 1, pp. 107-113, 2008.

[59] N. Maheshwari, R. Nanduri and V. Varma, "Dynamic energy efficient data placement and cluster reconfiguration algorithm for MapReduce framework," *Future Generation Computer Systems*, vol. 28, no. 1, pp. 119-127, January 2012.

[60] T. White, *Hadoop: The definitive guide*, 2nd ed.; O'Reilly Media, Inc., 2012.

[61] D. Kumar and B. Sahoo, "Energy Efficient Heuristic Resource Allocation for Cloud Computing," *International Journal of Artificial Intelligent Systems and Machine Learning*, vol.6, no. 1, pp.32-38, January 2014.

[62] J. Li, J. Peng and W. Zhang, "A scheduling algorithm for private clouds," *Journal of Convergence Information Technology*, vol. 6, no. 7, pp. 1-9, July 2011.

[63] D. Lucanin and Ivona Brandic, "Take a break: cloud scheduling optimized for real-time electricity pricing," In *Cloud and Green Computing (CGC), 2013 Third International Conference on*, pp. 113-120. IEEE, September 2013.

[64] K. Pepple, *Deploying OpenStack*, 1st ed.; O'Reilly Media, Inc., 2011.

[65] R. Santhosh and T. Ravichandran, "Pre-emptive scheduling of on-line real time services with task migration for cloud computing," In *Pattern Recognition, Informatics and Mobile Engineering (PRIME), 2013 International Conference on*, pp. 271-276. IEEE, February 2013.

[66] B. Furht, *Handbook of social network technologies and applications*. Vol. 1. New York: Springer, 2010.

[67] C. Xiong, L. Feng and L. Chen, "A New Task Scheduling Algorithm Based on Improved Genetic

Algorithm in Cloud Computing Environment," *AISS: Advances in Information Sciences and Service Sciences*, vol. 5, no. 3, pp. 32-38, February 2013.

[68] J. Liu, X. Luo, X. Zhang, F. Zhang and B. Li, "Job scheduling model for cloud computing based on multi-objective genetic algorithm," *IJCSI International Journal of Computer Science*, vol. 10, no. 1, pp. 134-139, January 2013.

[69] S. R. Suraj and R. Natchadalingam, "Adaptive Genetic Algorithm for Efficient Resource Management in Cloud Computing," *International Journal of Emerging Technology and Advanced Engineering*, vol. 4, no. 2, pp. 350-356, February 2014.

[70] X. Wang, Y. Wang and H. Zhu, "Energy-efficient task scheduling model based on MapReduce for cloud computing using genetic algorithm," *Journal of Computers*, vol. 7, no. 12, pp. 2962-2970, December 2012.

[71] S. Srikantaiah, A. Kansal and F. Zhao, "Energy aware consolidation for cloud computing," In *Proceedings HotPower'08 Proceedings of the 2008 conference on Power aware computing and systems*, vol. 10, pp. 1-10. 2008.

Author Profile

Iza'in Nurfateha Ruzan received her Bachelor Science degree in Computer Science (Software Engineering) from Universiti Teknologi Malaysia in 2010. At present she is pursuing the Master of Science (Computer Science) fulltime research at Universiti Teknologi Malaysia. Her research interests include Cloud Computing, Scheduling Theory and Soft Computing.

Suriayati Chuprat received her Doctor of Philosophy (Mathematics) from Universiti Teknologi Malaysia in 2009. In 2013-2014, she attached to University of York, United Kingdom for a Post-Doctoral program. At present she is working as Senior Lecturer at Advanced Informatics School Universiti Teknologi Malaysia, Kuala Lumpur, Malaysia. Her research interests include Real-time Systems, Scheduling Theory, Parallel Computing and Security Cloud Computing.

Pegah Razmara received her Master of Science from Universiti Teknologi Malaysia in 2010. At present she is pursuing the Doctor of Philosophy (Computer Science) from Universiti Teknologi Malaysia. Her research interests include Real-time Systems, Scheduling, Resource Allocation, Parallel and Distributed Computing.