



## Holistic Resource Management for Sustainable and Reliable Cloud Computing: An Innovative Solution to Global Challenge

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### Abstract:

Minimizing the energy consumption of servers within cloud computing systems is of utmost importance to cloud providers towards reducing operational costs and enhancing service sustainability by consolidating services onto fewer active servers. Moreover, providers must also provision high levels of availability and reliability, hence cloud services are frequently replicated across servers that subsequently increases server energy consumption and resource overhead. These two objectives can present a potential conflict within cloud resource management decision making that must balance between service consolidation and replication to minimize energy consumption whilst maximizing server availability and reliability, respectively. In this keynote talk, I shall discuss a energy-reliability aware resource scheduling approach for holistic management of cloud computing resources including servers, networks, storage, and cooling systems. This technique clusters and executes heterogeneous workloads on provisioned cloud resources and enhances the energy-efficiency and reduces the carbon footprint in datacenters without adversely affecting cloud service reliability.

### Biography:

Sukhpal Singh Gill is a Lecturer (Assistant Professor) in Cloud Computing at School of Electronic Engineering and Computer Science (EECS), Queen Mary University of London, UK. Prior to this, Dr. Gill has held positions as a Research Associate at the School of Computing and Communications, Lancaster University, UK and also as a Postdoctoral Research Fellow at the Cloud Computing and Distributed Systems (CLOUDS) Laboratory, School of Computing and Information Systems, The University of Melbourne, Australia. Dr. Gill was a research visor at



Monash University, University of Manitoba and Imperial College London. His research interests include Cloud Computing, Fog Computing and IoT. For further information on Dr. Gill, please visit: [www.ssgill.me](http://www.ssgill.me).

### Publication of speakers:

1. Gill, Sukhpal Singh & Garraghan, Peter & Stankovski, Vlado & Casale, Giuliano & Thulasiram, Ruppa & Ghosh, Soumya & Ramamohanarao, Kotagiri & Buyya, Rajkumar. (2019). Holistic Resource Management for Sustainable and Reliable Cloud Computing: An Innovative Solution to Global Challenge. *Journal of Systems and Software*. 155. 104-129. 10.1016/j.jss.2019.05.025.
2. Gill, Sukhpal Singh & Tuli, Shreshth & Xu, Minxian & Singh, Inderpreet & Singh, Karan Vijay & Lindsay, Dominic & Tuli, Shikhar & Smirnova, Daria & Singh, Manmeet & Jain, Udit & Pervaiz, Haris & Sehgal, Bhanu & Kaila, Sukhwinder & Misra, Sanjay & Aslanpour, Mohammad Sadegh & Mehta, Harshit & Stankovski, Vlado & Garraghan, Peter. (2019). Transformative Effects of IoT, Blockchain and Artificial Intelligence on Cloud Computing: Evolution, Vision, Trends and Open Challenges. 8. 100118. 10.1016/j.iot.2019.100118.

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