Abstract

The area of energy harvesting has seen various evolutions among the research community. Although various studies have been attempted to address the issues of energy harvesting in the past decade, but very few studies are focused on using RF energy from mobile phones explicitly. Hence, the prime motive of the proposed study is to showcase a mathematical model of RF energy harvesting using stochastic approach termed as SMEH i.e. Stochastic Method of Energy Harvesting. SMEH is designed analytically and evaluated using simulation based approach considering various near real time constraints of mobile devices, traffic scenario, as well as discrete state definition of the system for better analytical evaluation. The outcome of the proposed system is analyzed using probability for loss of event, queuing delay, throughput and compared with the most recent standard work in the similar direction.

References

- S. Shrestha, S-K Noh, D-Y Choi, "Comparative Study of Antenna Designs for RF
- http://www.mouser.in/applications/rf_energy_harvesting/
- S. Lemey, F. Declercq and H. Rogier, &quot;Textile Antennas as Hybrid Energy-Harvesting Platforms,&quot; Proceedings of the IEEE, Vol. 102, No. 11, 2014
- M. H. Ouda, M. Arsalan, L. Marnat, A. Shamim, and K. N. Salama, &quot;5.2-GHz RF Power Harvester in 0.18-/spl mu/m CMOS for Implantable Intraocular Pressure Monitoring,&quot; IEEE Transactions on Microwave Theory and Techniques, Vol. 61, No. 5, pp. 2177-2184, 2013
- M. Arrawatia, M. S. Baghini and G. Kumar, &quot;RF energy harvesting system from cell towers in 900MHz band,&quot; IEEE-Conference In Communications, pp. 1-5, 2011
- J. Gummesson, S. S. Clark, K. Fu, and D. Ganesan, &quot;On the limits of effective hybrid micro-energy harvesting on mobile crfids sensors,&quot; Proceedings of the 8th international conference on Mobile systems, applications, and services, pp. 195-208, 2010
- M. E-d. Ahmad, &quot;Energy Harvesting Using a Cheap Easy-to-Fabricate FM Rectenna,&quot; In The World Congress on Electronics and Electrical Engineering WCEEEENG, Vol. 9, pp. 6-9, 2009
- S. P. Beeby, M. J. Tudor and N. M. White, &quot;Energy harvesting vibration sources for microsystems applications,&quot; Measurement science and Technology, Vol. 17, No. 12, 2006
SMEH: Stochastic Method of Energy Harvesting for Powering up Mobile Phones

5, Iss. 7, pp. 157-169, 2014


Index Terms

Computer Science  Information Science

Keywords

RF-Energy harvesting  Stochastic  Probability  Throughput