RESEARCH METHODOLOGY

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| Research Item | Year | Methodology (Performance and network design) |
| [[Paper 1](http://ijame.ump.edu.my/images/Vol_14_Issue1/12_rahman%20et%20al.pdf)] |  | A performance investigation on IoT enabled intra-vehicular wireless sensor networks   * Existing MAC protocol * Rice and Rayleigh fading distribution functions (wireless channels) * Performance evaluation: Varying traffic load & network nodes   Testing tools:   * OPNET – discrete event simulator (ZigBee module) |
| [[Paper 2](file:///C:\Users\Agrippina%20Mwangi\Zotero\storage\DCIE3LIC)] |  | Energy aware cluster and neuro fuzzy based routing algorithm for wireless sensor networks in IoT |
| [[Paper 3](file:///C:\Users\Agrippina%20Mwangi\Zotero\storage\4CZRBWRT)] |  | Real time performance of a self-powered environmental IoT sensor network system   * Supercapacitors a suitable primary energy source for sensor nodes in a sensor network system. Using both supercapacitors and battery in the sensor node system will increase the feasibility of the network design architectures. * Use of rechargeable batteries with solar powered energy harvesting techniques. * Network reliability tested by checking packet delivery via the given communication channel. * Solar energy harvesting approach -> Keeps the sensor nodes active and reliable for a whole day |
| [[Paper 4](file:///C:\Users\Agrippina%20Mwangi\Zotero\storage\WKGCBYKV)] | 2016 | Towards wireless sensor network softwarization   * 6LoWPAN-based IoT-sensor networks and cloud computing * Implementation of CoAP application layer protocol over 6LoWAPAN gateway (web applications access) * Cooja – prediction tool for PSC network performance * NS-3, Cooja, Shawn * Cooja simulator - Instant Contiki 2.7 (replicating hardware) * “Powertrace” tool – power consumption of the virtual sensor cloud nodes in terms of RDC. * For homogeneous PSC within the network – Contiki OS * Key modeled indicators – QoS matrix * Performance modeling environment – Cooja, MATLAB * PHP scripting language (Database queries) * RDC – setting up sleep period of nodes * Polling mechanism (star topology network) |
| [[Paper 5](https://royalsocietypublishing-org.proxy.library.uu.nl/doi/10.1098/rsta.2011.0330)] | 2012 | Operating systems and network protocols for wireless sensor networks   * Operating systems: TinyOS, Mantis, SOS, LiteOS, and Contiki. * Contiki uses standard C. * Sensor network operating systems * Event driven execution model (event handler) * Multi-threaded model (memory efficiency) * Protothread model (sequential flow of control) * Event handlers have run-to-completion semantics * Use of state machines (follow a set of simple patterns) * Memory allocation mechanisms – memory fragmentation & dynamic memory allocation & static memory allocation * Sensor networks are battery powered * Communication energy management is handled by a separate radio duty cycling mechanism * Eon system and Pixie OS * Network architecture: services, interfaces, and protocols |
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Glossary

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| Acronym | Description |
| MAC | Media Access control |
| RDC | Radio duty cycling |
| PSC | Physical sensor cloud |
| VSC | Virtual sensor cloud |
| CoAP |  |