Benchmarking Wireless Sensor Networks

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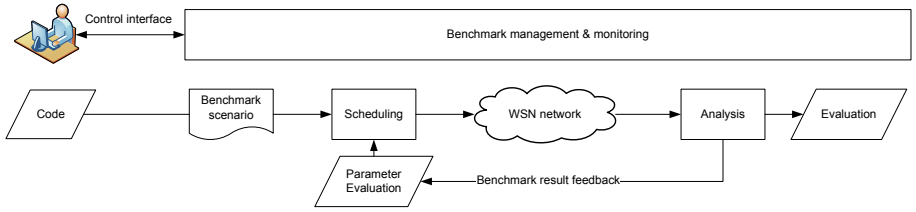
Wireless Sensor Network (WSN) research is a relatively new research field, where miniature devices create autonomous wireless networks for diverse applications such as home automation and intelligent vehicles. The tiny computers are very limited in resources and consist out of cheap hardware, posing many different research challenges that are less apparent in other research domains, such as quickly draining batteries and instable hardware.

When software for these devices is developed, research efforts are often focused on the development of a tiny portion of the entire system, without regard for other possible components. This leads to theoretical research and ideas, that fail to deliver in real life. Currently, researchers haven't agreed on a set of methods to evaluate the performance of developed software or hardware. To fill this void, we have introduced an experimentation methodology to increase the value of performance evaluations by making results comparable.

We have created a framework based on this methodology, shown in the figure. The system takes care of the entire experiment, from description to evaluation, so that a strict compliance to our methodology is guaranteed. This allows any user of the framework to make valid assumptions about their experiment, compared to other users of the same framework. To make the results reliable, the system has to closely monitor the experiment itself, but also the wireless environment since there are very little places on this planet where there are no iPhones or Wi-Fi hotspots around to interfere with a wireless experiment.



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