

**Semi-automated index based decision making engine for cyber foraging framework with minimal energy and performance cost**

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Cyber Foraging is a concept to take advantage of the nearby underutilized computing resources (surrogates) to improve user experience of resource constraint handheld devices, by improving their performance while improving battery consumption. It's not always beneficial to offload the tasks to the surrogates so there is a need for a decision making engine to only offload tasks, which will result in overall improvement in performance and battery consumption. There are many attempts to enable cyber foraging in smartphones, each having their own decision making mechanisms, some using fully automated Machine Learning Algorithms and Heuristic Data; and it has been proven inefficient even though with higher accuracy. Furthermore, these approaches fail to deliver accurate results when it comes to new applications without any historical data. The key drawback of them can be seen as the resource intensive decision making engine, which negatively effects on the overall performance and battery consumption of the device. We introduce a model for decision making engine, which takes context parameters like remaining battery, worst case complexity of the method, etc. into account, when making the choice to offload or not to the surrogate, during the runtime. The engine benchmarks the surrogate according to their capabilities such as: available JVM memory, accessible processing cores, which can be harnessed by the surrogate service used by the cyber foraging enabled mobile application using static policies. These indexes will then be used to compare with the worst case complexity value, which the developer has assigned to the identified intensive parts of the application. This approach will give a satisfactory amount of accuracy with extremely low cost of energy and higher performance. Further research is being done on addressing more complex use cases with more advanced algorithms towards a stable and reliable solution.

**Keywords:** Cyber foraging, Decision making, Automation, Efficiency