Despite of all the advances in smartphone technology in recent years, smartphones still remain limited by their battery life. One of the major sources of energy consumption in smartphones is the cellular data network interface. In order to achieve the data rates required by smartphone applications, the radio consumes a considerable amount of energy. In addition, bad reception has been proven to greatly increase the amount of energy consumed by the radio. Thus, an intuitive approach to maximize the battery life of smartphones is to turn off the radio when the user is not using the smartphone. However, although this would reduce the impact of the radio in the battery, it would also prevent smartphones from receiving real time notifications such as new email arrivals and social media updates.

To increase battery life without compromising any functionality we propose implementing a push mechanism that, unlike current push technologies employed by smartphones, does not require a data connection. This mechanism relies on the short message service (SMS) to deliver notifications to the smartphone. We have implemented a prototype of our energy saving scheme and push mechanism and have achieved significant energy savings. In an area with bad reception, our prototype can make the battery of the smartphone last up to 6 times longer. Also, we demonstrate that our push mechanism provides much of the functionality offered by the regular smartphone push technologies.

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Approved for distribution by Dr. Cliff Zou, Committee Chair, on February 23, 2014.