Abstract

Distributed computing is a difficult and important topic in many system applications today. Imagine a scenario where an AMBER alert is issued for a missing child and we could use the power of distributed computing to help aid this process. Here we propose a robust and agile system that crowd sources the task of image recognition. One of the most important aspects of the system is the use of cloudlets to decrease latency and offload tasks to a better and faster device. In addition to cloudlets, our system handles joining and leaving of phones as needed and also follows a model of active replication to achieve fault tolerance.

Goals

Our goal is to create a distributed system architecture that can crowd source the task of image recognition by letting everyday phone users to take pictures and upload them, hence adding more data to the task. Agility, the ability to let users leave and join at any time, is the primary goal of the system. The important targets for this architecture are hence two-fold: Reducing the time and inefficiency for the user uploading images and allowing various kinds of failures so that the system is up and running when needed.

Agility & Fault Tolerance

One of the primary aspects of the system is the ability of the end user to join and leave as needed. This is referred to as the agility. The way we achieve this is by having the end user do the minimum amount of work needed. In this case it would refer to only uploading the images and letting the image recognition task be offloaded to a nearby cloudlet. It is also extremely important for the system to be fault tolerant as it would be used by several thousand users. To do this we follow a model of active replication, with detection using heartbeats and instant fail-over.

References