**Abstract**

There has been tremendous growth in the amount of visual data available on the Internet in recent years. One type of visual data of particular interest is produced by network cameras providing real-time views. Millions of network cameras around the world continuously stream data to viewers connected to the Internet. This data may be used by a wide variety of applications such as enhancing public safety, urban planning, emergency response, and traffic management which are computationally intensive. Analyzing this data requires significant amounts of computational resources. Cloud computing can be a preferred solution for meeting the resource requirements for analyzing these data. There are many options when selecting cloud instances (amounts of memory, number of cores, locations, etc.). Inefficient provisioning of cloud resources may become costly in pay-per-use cloud computing. This paper presents a method to select cloud instances in order to meet the performance requirements for visual data analysis at a lower cost. We measure the frame rates when analyzing the data using different computer vision methods and model the relationships between frame rates and resource utilizations. We formulate the problem of managing cloud resources as a Variable Size Bin Packing Problem and use a heuristic solution. Experiments using Amazon EC2 validate the model and demonstrate that the proposed solution can reduce the cost up to 62% while meeting the performance requirements.