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in Learning and Industry
(OptALI)**

IRSES

Ongoing Deliverable D1.2

**An Allocation Algorithm for
Distributed Gaming in Internet Cafes**

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Participants: UGOE
UNIKL
DTU
UOA
UC

Author of deliverable: Isaac Hamling (isaac.hamling@auckland.ac.nz)

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Subject: An Allocation Algorithm for Distributed Gaming in Internet Cafes

Problem: In internet cafes customers pay a per hour rate to use a computer for a variety of tasks such as; web browsing, playing games, and watching videos. These tasks require varying quantities of computing power to run, the computers in the internet cafe must have enough computing power to run the highest requirement task. However in reality most users only require a small portion of that computing power. This produces inefficiency where the computing power available greatly exceeds the average power utilised. In some internet cafes they have multiple zones where each zone has a different task its designed to run. While zoning is an improvement in terms of resource efficiency it creates limitations in that zone sizes are fixed as is the location where the customer can sit. By utilising cloud computing it is possible to replace these computers with server infrastructure that can supply only the computing power demanded by each customer. Like zones this improves efficiency but still allows customers to sit anywhere in the internet cafe, and offers flexibility in the size of the zones.

Using servers as a replacement for computers requires a method by which customers can be allocated computing resources from the servers pool of available resources. This requires an allocation algorithm which determines to which server a customer should be placed and additionally whether the user is worth placing given the resources they will consume. This problem is naturally an online problem as a customer arrives, purchases time on computers, and then uses the resources until they leave. After developing an offline algorithm, both a greedy and strategic online algorithm has been developed for user allocation.

Main Results: The offline algorithm showed boosts in profit over a traditional zoning model, and increases in per hour percentage utilisation of all resources over a traditional two zone internet cafe.

The greedy online algorithm shows reasonable results compared to the offline algorithm for the generated real data sets. The strategic online algorithm however performs poorly and requires significant tuning to make it more aggressively accept customers.

Participants: Students and Researchers at UNIKL