

Routing Medical Images with Tabu Search and Simulated Annealing: A Study on Quality of Service

Authors : Mejía M. Paula, Ramírez L. Leonardo, Puerta A. Gabriel

Abstract : In telemedicine, the image repository service is important to increase the accuracy of diagnostic support of medical personnel. This study makes comparison between two routing algorithms regarding the quality of service (QoS), to be able to analyze the optimal performance at the time of loading and/or downloading of medical images. This study focused on comparing the performance of Tabu Search with other heuristic and metaheuristic algorithms that improve QoS in telemedicine services in Colombia. For this, Tabu Search and Simulated Annealing heuristic algorithms are chosen for their high usability in this type of applications; the QoS is measured taking into account the following metrics: Delay, Throughput, Jitter and Latency. In addition, routing tests were carried out on ten images in digital image and communication in medicine (DICOM) format of 40 MB. These tests were carried out for ten minutes with different traffic conditions, reaching a total of 25 tests, from a server of Universidad Militar Nueva Granada (UMNG) in Bogotá-Colombia to a remote user in Universidad de Santiago de Chile (USACH) - Chile. The results show that Tabu search presents a better QoS performance compared to Simulated Annealing, managing to optimize the routing of medical images, a basic requirement to offer diagnostic images services in telemedicine.

Keywords : medical image, QoS, simulated annealing, Tabu search, telemedicine

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