

FINAL REPORT

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NASA-ASEE Summer Faculty Fellowship Program

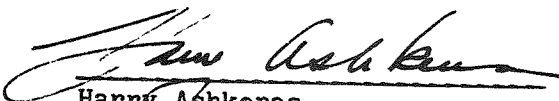
Jet Propulsion Laboratory
California Institute of Technology

Submitted to

ASEE Summer Faculty Program Committee

ASEE
Suite 200
Eleven Dupont Circle
Washington, D.C. 20036


Arden L. Albee
Co-Director, Caltech/JPL


Harry Ashkenas
Co-Director, Caltech/JPL

LOAD BALANCING OBJECTS FOR
TIME WARP ON A HYPERCUBE

Steven F. Bellenot

The Florida State University
Math and Computer Science
Tallahassee, Florida 32306

Originally, I was to develop a "benchmark" for the study of speed up of the time warp operating system running on a hypercube and study the load balancing question. Load balancing here means where (which processor) do you put your objects to obtain best speed up. However, the last half of my summer was spent debugging time warp code. (Perhaps as all projects, it was a bit behind schedule and help was needed.)

My benchmark program was about the dining philosophers. The dining philosophers is as close as any problem in computer science to being a classic. It is regular enough so that load balancing is easy. Thus parameters like the cost of message distance, communication vs. computation and message length could be easily measured. However, these tests can't be made until the time warp operating system is up and running. The code for this benchmark has been tested on the simulator.

As for load balancing in general there are two results. One is a general idea on how to measure success. The other is an object to node assignment for the COMMO* simulation, the main test case for the sponsors. In general, the question of load balancing is accepted as being a hard one. Thus any results are at least somewhat rewarding.

Debugging an operating system isn't just a summer's project. It isn't done nor is it likely to be completed for several months. However, I think that I have made significant progress in this area. (Perhaps the opinions of co-workers would be of value here.) In any case, I got time warp up to a point where its major functions of rollback, message annihilation and GVT calculations could be tested. In doing so, I brought up the low level units of time warp on memory management, lists and queues.