An Initial Design for the Framework for the Visualization of N-Body Simulations

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Last Time: Initial Tasks

- Design a simple controller language and layer API
- Implement a basic controller interpreter
- Implement a basic view
More Tasks

• Implement a GUI

• Create high-level languages to describe motion and more advanced features
SPRACHE: COMMANDS*
    |  #  COMMENT

COMMANDS:  CAMERA_CMDS
    | WORLD_CMDS
    | updateview      % update the view, then pause for timestep seconds
    | +frame          % move to next frame
    | -frame          % move to previous frame
    | load FILENAME   % load a data set
    | DEFINE_CMD
    | PAUSE_CMD
    | SELECT_CMD
    | DESELECT_CMD

CAMERA_CMDS: camera CAMERA_CMD*

CAMERA_CMD: location POS
    | translate POS
    | lookat POS
    | rotate ANGLES
    | up VECTOR
    | select #
    | join # [#]

WORLD_CMDS: world WORLD_CMD*
WORLD_CMD: size DIMENSIONS

DEFINE_CMDS: define DEFINE_CMD*
DEFINE_CMD: timestep #
    | CAMERA_SURFACE_CMD

CAMERA_SURFACE_CMD: camera_surface CAMERA_SURFACE_TYPE

CAMERA_SURFACE_TYPE: sphere center=POS radius=#
    | sphere_lookat_center center=POS radius=#
    | none
PAUSE_CMD: pause # % seconds to pause

SELECT_CMD: select SELECTION

DESELECT_CMD: deselect SELECTION

SELECTION: all
| [# - #] % select a range of stars
| #, #*  % select a list of stars

POS: # # #
ANGLES: # # #
DIMENSIONS: # # #
VECTOR: # # #

eexample 1
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load sample.in

# set the world dimensions
world size 10000 10000 10000

# position the camera on the world’s boundary looking in
camera position 0 0 0
camera translate 0 0 -10000

define timestep .5

updateview

# move the camera towards the center
camera translate 0 0 1000
updateview
camera translate 0 0 1000
updateview
camera translate 0 0 1000
updateview
camera translate 0 0 1000
updateview
camera translate 0 0 1000
updateview

pause 5

# now move the camera back
camera translate 0 0 -1000
updateview
camera translate 0 0 -1000
updateview
camera translate 0 0 -1000
updateview
camera translate 0 0 -1000
updateview
camera translate 0 0 -1000
updateview
Implementation

• Each component is language independent

• Feeder and Controller will be written in Java

• View will be written in C++ for speed (OpenGL)
Still to Do

- Implement a basic view with controls

- Support multiple connections in the controller and view

- Language to control flight paths