





The Cross-platform Implementation of AERO

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USER'S GUIDE

The Animation Editor for Realistic Objects (**AERO**) is a tool for simulating rigid-body systems that has been tested on several Unix-compatible machines including Linux PCs, HP-, DEC-, SGI-, SUN-, and IBM workstations. AERO exists as an X-windows program called **xaero** that features a 3D scene editor and real time simulation of scenes in *animation* mode. For compilation, X-windows libraries, Athena-Widget-Set, FWF library and ANSI-C compilers are needed. These libraries, however, are not so easy to compile, or may be incompatible with the future versions and unsupported by later versions of the operating system. Thus, the main simulator module of **xaero** is extracted to be able to run the program in any operating system in batch mode.

wxAero is the cross-platform implementation of AERO. It has been tested on  **Windows** operating system and  **redhat** linux (hence the prefix **wx**) and with minimal code changes, it can be deployed in other operating systems. At the moment though, the animation mode is available only on X-window systems.

USING **wxAERO**

wxAero is started with the command **wxAero** followed by optional command line parameters. In X-window systems with FWF support, the program starts in interactive mode and displays the editor window when no parameters are specified. The command line parameters are:

- b** : run program in batch mode
- D** name : specify input file for moving animation camera
- E** name : specify input file for ground acceleration data
- f** name : specify input file of sequence or world (single state)
- h** : display help info
- E** <dir:degrees> <name> : direction and filename of ground acc. data
- Eh** <dir:degrees> <xg0:m> <wg:rad/s> <alpha: dimensionless>
 - : horizontal harmonic ground motion parameters
 - > alpha = 0: constant amplitude
 - The displacement is computed as
 - > $z_g(t) = xg0.\sin(wg.t)$
 - > $aXg(t) = [-xg0.wg^2.\sin(wg.t)] \cos(dir)$
 - > $aYg(t) = [-xg0.wg^2.\sin(wg.t)] \sin(dir)$
 - > alpha \neq 0: slowly increasing amplitude. The displacement is
 - > $z_g(t) = xg0.alpha.t.\sin(wg.t)$
- Dh** : Horizontal ground displacement used to move the camera

Batch mode parameters (used only with the **-b** option)

- nb** count : number of frames to be computed
- r** name : specify output directory/filename of **POV-Ray**[®] scene files
- s** name : specify output file for sequence
- S** name : specify output directory/filename of computed state (as world-file)
- trace** : perform motion trace according to *objTrace.list*
- springtrace** : perform spring trace
- X** : shut-down computer when done computing

wxAero

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Sequence files are created only using the `-s` option. Unlike `xaero`, no default scene file will be created when no `-s` parameter is specified. This saves computational time, if it is not desired.

VIA NETWORK

`wxAero` can be run via Local Area Network. If launched by a client, server-side `wxAero` accesses and manipulates resources (e.g. memory and processor) of the server and display will be sent to the client.



Batch Mode. The batch mode version of `wxAero` can be executed on a client computer (e.g. *client 2* on *server*) using `telnet`.

1. Issue a `telnet` command to communicate with the server using TELNET protocol

```
[eating@client ~]$ telnet <server_ip_address>  
<server operating system> version ***  
login:
```
2. Log in to the server using your (server) account.
3. Run `wxAero` in the appropriate directory.

Animation Mode. Assuming that the full version of `wxAero` is installed in a server, a `UNIX`-compatible client (e.g. *client 1* on *server*) can execute `wxAero` by issuing the following commands:

1. Issue a server access control command

```
[eating@client ~]$ xhost <server_ip_address>  
<server_ip_address> being added to access control list
```
2. Issue a `telnet` command to communicate with the server using TELNET protocol

```
[eating@client ~]$ telnet <server_ip_address>  
<server operating system> version ***  
login:
```
3. Log in to the computer using your (server) account
4. Run in C-shell

```
[eating@server eating ~]$ csh
```
5. Change the environment variable `DISPLAY` to 0 (send display to client)

```
[eating@server ~]$ setenv DISPLAY <client_ip_address>:0.0
```
6. Run `wxAero` in the appropriate directory.



To execute the animation mode of `wxAero` on a `non-UNIX` compatible platform (e.g. *client 2* on *server*), commercial terminal emulator softwares like **WRQ reflection** must be used. **Reflection**® allows your PC to run the same X-based applications that X terminals or workstations run.
