



Calhoun: The NPS Institutional Archive

Faculty and Researcher Publications

Faculty and Researcher Publications

1997

Virtual world for an autonomous underwater vehicle (AUV)

Brutzman, Don

<http://hdl.handle.net/10945/41920>



Calhoun is a project of the Dudley Knox Library at NPS, furthering the precepts and goals of open government and government transparency. All information contained herein has been approved for release by the NPS Public Affairs Officer.

Dudley Knox Library / Naval Postgraduate School
411 Dyer Road / 1 University Circle
Monterey, California USA 93943

<http://www.nps.edu/library>

vy.mil/%7Eauv/

Go

DEC JAN APR Close

1998 27 1999 2000 Help

Virtual World for an Autonomous Underwater Vehicle

NPS *Phoenix* AUV

[graphics rendering](#), [wireframe rendering](#), [OpenInventor object](#), [VRML scene](#)

[NPS Center for AUV Research](#)

[Current thesis projects](#) for [Don Brutzman](#)

(about [Say...](#))

[A freely distributable tar archive of the virtual world software is here: \[auv-uvw.tar.gz\]\(#\)](#) including source code and executable binaries that run on Silicon Graphics Inc. (SGI) workstations. Last archive update is in file [auv-uvw.UPDATE](#) and changes are logged in [auv-uvw.CHANGE_LOG](#).

A [User Installation and Execution Guide](#) is available. Please let me know if you need help installing the virtual world. Research collaboration is welcome.

The [Software Reference](#) contains individually available copies of all software programs.

The [Process Launcher](#) form tells how to launch AUV and virtual world processes.

[Tutorial: Virtual World for an Autonomous Underwater Vehicle](#)

Simulation results: Brutzman, Don, Brauns, Bryan, Fleischman, Paul, Lesperance, Tony, Roth, Brian and Young, Forrest, "Evaluation of AUV Search Tactics for Rapid Minefield Traversal using Analytic Simulation and a Virtual World," *Symposium on Technology and the Mine Problem*, Mine Warfare Association, Naval Postgraduate School, Monterey California, November 18-21 1996. Available at <http://www.stl.nps.navy.mil/~auv/simulation/mcm96.ps> with software and results available at <http://www.stl.nps.navy.mil/~auv/simulation/>

I successfully defended a [dissertation](#) on this subject 30 NOV 94. It is in PostScript format at <http://www.stl.nps.navy.mil/~brutzman/dissertation/>

A book chapter describing all aspects of the AUV and virtual world: Brutzman, Don, Healey, Tony, Marco, Dave and McGhee, Bob, "The *Phoenix* Autonomous Underwater Vehicle," *AI-Based Mobile Robots*, editors David Kortenkamp, Pete Bonasso and Robin



Murphy, MIT/AAAI Press, Cambridge Massachusetts, to appear 1997. Available at <http://www.stl.nps.navy.mil/~auv/aimr.ps>

An introductory paper on this work: Brutzman, Don, "[Virtual World Visualization for an Autonomous Underwater Vehicle](#)," *Proceedings of the IEEE Oceanic Engineering Society Conference OCEANS 95*, San Diego California, October 12-15 1995, pp. 1592-1600. Available at <ftp://taurus.cs.nps.navy.mil/pub/auv/oceans95.ps.Z>

Recent progress: Brutzman, Don, Burns, Mike, Campbell, Mike, Davis, Duane, Healey, Tony, Holden, Mike, Leonhardt, Brad, Marco, Dave, McClarin, Dave, McGhee, Bob and Whalen, Russ, "[NPS Phoenix AUV Software Integration and In-Water Testing](#)," *IEEE Autonomous Underwater Vehicles (AUV) 96*, Monterey California, June 3-6, 1996. Available at <ftp://taurus.cs.nps.navy.mil/pub/auv/auv96.ps>

A useful help file is the mission command syntax for NPS AUV execution level control: [mission.script.HELP](#)

Here are AUV group [host IP numbers, hostnames and telephone numbers](#) of interest.

Current work includes an experimental [network status monitoring page](#).

Here is a sample [NPS AUV mission report](#) run in the virtual world. If *finger* is unlocked, you can also finger_auv@stl.nps.navy.mil for a sample mission report.

Additional supporting papers and programs are distributed separately.

- ["From virtual world to reality: designing an autonomous underwater robot" paper and slides](#).
- [Vehicle telemetry postscript plots \(20 pages\) for the SIGGRAPH mission](#).
- [www line mode World-Wide Web browser](#) distribution page for the [www anonymous ftp directory](#). **www** is used to make World-Wide Web queries from inside the virtual world. This program is needed if you want live text to speech capability. Put **www** in the /dynamics directory or have your system administrator install it.



- [gnuplot plotting program](#) distribution directory (and [gnuplot FAQ home page](#)). **gnuplot** is used to plot robot telemetry results. **gnuplot** is needed if you want a plotting capability. Put it in the /execution directory or have your system administrator install it.
- [gcc/g++ FAQ](#) for the GNU C/C++ compiler.
- [Mosaic](#) and [Netscape](#) software download sites.
- [OpenInventor](#) technical support pages.
- [VRML Repository](#) and [VRML Frequently Asked Questions \(FAQ\)](#) page.
- [perl](#) scripting language references.

[Multicast Backbone \(MBone\)](#) connection information: an MBone connection is needed if you want to participate in worldwide audio/video/DIS multicasts with the underwater virtual world. If you are a local user on the gravy5.cs.nps.navy.mil subnet, you don't have to download the full distribution but instead can copy the MBone session director (**sd**) configuration file [.sd.tcl](#) and [.mailcap-auv-uvw mosaic initialization file](#) to your root directory, backup your *.mailcap*, rename the new version to *.mailcap*, and then paste the following [.cshrc aliases](#) into your root directory **.cshrc** file. Some path editing may be necessary. After you **source .cshrc** you are ready to run **sd** and **mosaic**.



The NPS AUV Underwater Virtual World also appeared at [The Edge](#) exhibition at [SIGGRAPH 94](#), July 26-29 in Orlando Florida USA. There was a simultaneous [MBone multicast on the worldwide Internet](#) all that week. Information resources from that exhibit include the [project abstract](#), [collaborator list](#), [people pages](#), [1000-word description](#) and [proposal](#) for exhibition in [The Edge](#) exhibition at [SIGGRAPH 94](#), and [audio/video multicast on the Internet MBone](#).

Uniform Resource Locator (URL) for this home page is <http://www.stl.nps.navy.mil/~auv/>

NPS AUV Underwater Virtual World contact: [Don Brutzman \(brutzman@nps.navy.mil\)](mailto:brutzman@nps.navy.mil) (16 November 98) ([official disclaimer](#))