

REUSABLE SOFTWARE COMPONENTS

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This column consists of our yearly listing of sources for reusable software components. As always, no recommendation or guarantee by this column is implied.

Ada Basis WWW Server

Ada Basis WWW Server is an archive of about 560Mbyte of public domain source code and documents mainly obtained from the Public Ada Library. The software has been classified into different application domains and presented in a hierarchical manner.

AdaBasis is an acronym for the German phrase "Bibliothek anwendungsbezogener Ada Software-Komponenten in Stuttgart" and is a repository of (mostly) free Ada Software, presented in a way that is (hopefully) easy to use and allows flexible access and effective searching.

The application domains include:

Artificial Intelligence	Compilers
Database Management	Documents
Text-Processing	Interfaces/Bindings
Mathematical Functions and Data Structures	Networking and Distributed Processing
Software Development Tools	

CONTACT: adabasis@informatik.uni-stuttgart.de
<http://www.informatik.uni-stuttgart.de/ifi/ps/ada-software/ada-software.html>

The Ada-Belgium Archive

One of the aims of the Ada-Belgium organization is to disseminate Ada-related information. So, in addition to the organization of seminars, workshops, etc., and the management of two mailing lists, it also has set up an Ada archive primarily for people and companies in Belgium. This enables everyone interested to consult and download a large variety of Ada software and documents using an ftp server in Belgium or elsewhere.

Key items:

* A disk copy of the latest version of the Ada and Software Engineering Library (ASE2, a 2 disk CD-ROM set).

<ftp://ftp.cs.kuleuven.ac.be/pub/Ada-Belgium/cdrom/index.html>

* A directory with Free Ada Software provided by Belgian Ada users.

<http://www.cs.kuleuven.ac.be/~dirk/ada-belgium/software/>

The Ada-Belgium archive is primarily intended for the Belgian Ada community, but anyone interested is welcome to use it.

<http://www.cs.kuleuven.ac.be/~dirk/ada-belgium>

<http://www.cs.kuleuven.ac.be/~dirk/ada-belgium/archive.html>

FTP: <ftp://ftp.cs.kuleuven.ac.be/pub/Ada-Belgium>

ACES

The Ada Compiler Evaluation System (ACES) Version 2.1 is a collection of performance tests, test management tools, analysis tools, and assessment procedures that permit users to collect and analyze data on performance and usability characteristics of Ada implementations.

Originally funded by the AJPO, the ACES is a merger of the Ada Compiler Evaluation Capability (ACEC) and the Ada Evaluation System (AES). Version 2.1 of the ACES includes over 100 tests for language features introduced by Ada95. Other improvements include the provision of default processing choices, selection of tests by performance issue, a set of default analysis reports, and a facility for the easy inclusion of user-defined benchmarks in the ACES test selection and analysis processes.

ACES information is available on the Internet at:

<http://www.adaic.org/compiler/aces/aces-intro.html>

This document contains overview information as well as instructions for obtaining the ACES files.

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## AdaCore

AdaCore supports Libre (free) Software. (See GNU listed on a following page.) Its tools support Ada95 and C, with most of these tools written in Ada95. Its components include:

Ada mode for Emacs

Ada Web Server

AUnit (unit testing)

GDB (Ada95 debugger)

Glade (Ada 95 distributed annex)

GNAT (Ada 95 compiler)

GNOME/Ada

GPS (GNAT Programming Studio IDE)

GtkAda (GUI Development)

PolyORB

XML/Ada

Contact: <http://libre.adacore.com>

[libre@adacore.com](mailto:libre@adacore.com)

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Ada IC

The Ada Information Clearinghouse has been providing free information about Ada and software engineering for over fifteen years. Sponsored by the Ada Resource Assoc. (<http://www.adaresource.com>) a consortium of Ada tool vendors and developers, the AdaIC maintains close contact with the Ada community in order to obtain the latest information on a variety of topics. Visit their website, <http://www.adaic.org>, to see the latest in news, implementation guidelines, compilers and tools, reusable Ada code, education and training, Ada successes, and lessons learned by software developers.

The Ada-wide search engine indexes all known Ada content (more than 38,000 pages at last count). General search engines, such as Google, have too many references to the term "Ada" to make them practical for the purposes of the Ada community.

Please send any news you have on Ada to the Editorial Webmaster <webmaster@adaic.org>.

The Ada News of the AdaIC sometimes transmits press releases about the programming language to about 500 technical journalists and editors, as well as citing it on the AdaIC Website, as a free service to its users.

A comprehensive collection of Ada articles, reports, textbooks, videos, and CD-ROMS is available for browsing on-line through the AdaIC website. Users may access older components at the Virtual Library (<http://archive.adaic.com>).

AJPO

The Ada Joint Project Office was closed on October 1998. For information on the AJPO see
<http://sw-eng.falls-church.va.us/ajpofaq.html>

To obtain components previously available from PAL see
http://www.iste.uni-stuttgart.de/ps/AdaBasis/pal_1195/ada/ajpo/

Adalog

Adalog offers Ada utilities, Ada components, and Adapplets. These can be freely used and modified for any purpose, under the GMGPL license. Functions include Protection, Debugging, and OS_Services, among others.

The site also contains Adasubst/Adadep programs which are useful utilities for rearranging Ada programs, and AdaControl, a powerful utility for checking and enforcing style and coding rules.

These programs are built on top of ASIS and include valuable packages providing higher level queries for ASIS (package Thick_Queries). For example, look for the function called "Full_Name_Image," which returns the unique name of any Identifier.

SEE: <http://www.adalog.fr>

<http://www.adalog.fr/compo2.htm>

<http://www.adalog.fr/compo1.htm> (in French)

AdaPower

AdaPower.com is a repository of information, links to resources, source code examples and packages for reuse. AdaPower.com can be divided into the following sections:

Articles and Links

Articles and Links to Ada Related Topics, Ada learning materials, and people in the Ada on-line community

The Ada Source Code Treasury

Source code examples of using Ada and Ada related bindings and tools for both beginner and advanced students of Ada

Packages for Reuse

An extensive repository of categorically arranged packages for download and links to packages available for reuse on the internet

Ada Projects and AdaPower.net

Listings and hosting for Active Ada projects on the net

AdaPower.com has been completely rebuilt and is now database oriented, allowing for searches of the entire contents.

For information on GNAVI, a GNU Ada Visual Interface, see GNAVI below.

Please contact Ada Power with articles, links or package submissions, or for information on hosting your project on AdaPower.net see:

<http://www.adapower.com/>

<http://www.adapower.com/index.php?Command=Class&ClassID=AdaLibs&Title=Ada+Libraries>

ASE2

The ASE2 Library is an organization of software and other resources (freeware and shareware) on topics related to both Ada and Software Engineering, and there are several special-interest sections, such as sections on Microsoft Technologies, best practices, the Software Engineering Institute Capability Maturity Models, and website links. It is a resource for the practicing software engineer (regardless of implementation language) and the practicing Ada developer:

For the Practicing Software Engineer:

- The "Software Engineer's Bookshelf"
- Best practices in Software Engineering
- Index of useful web sites (with 17,000+ hyperlinks to them)
- Systems Engineering Capability Maturity Model (SEI)
- Systems Engineering Capability Model (EIA/IS 731)
- Systems Security Engineering Capability Maturity Model
- Software Capability Maturity Model
- Software Acquisition Capability Maturity Model
- People Capability Maturity Model
- Jim Gray's Turing Lecture - A Dozen Information Technology Research Goals
- Documents and tutorials on topics in Software Engineering, including Domain Engineering, Reuse Object-Oriented Analysis and Design, Object-Oriented Programming, Software Development Methodologies (Waterfall, Spiral, Rapid Application Development), Formal Methods, Cleanroom, Complexity Analysis, Metrics, Capability Maturity, Six Sigma, Personal Software Process, Team Software Process (including, new courseware on systems engineering, life cycles, requirements engineering, configuration management, risk management, reviews, and several other topics)
- General-purpose tools (such as GRASP - Graphical Representation of Algorithms, Structures, and Processes - for Ada, C, C++, Java, and VHDL from Auburn University with funding from ARPA, NASA and NSF)

For the Practicing Ada Developer:

- The "Ada User's Bookshelf" - 100M+ bytes of hypertext documents, tutorials, and references on Ada, reuse, real-time software intensive systems and software engineering
- Freeware Ada95 compilers and development environments for a variety of platforms, including Windows 95/98/NT and UNIX (such as GNAT Ada95 and C environment from Ada Core Technologies)
- Freeware Software components and tools - RAPID, AdaGIDE, SCATC DSK, GWRL, and the Booch components
- Ada Semantic Interface Specification (ASIS)
- Support for Ada95 education, including tutorials and freeware tools (such as AdaGIDE from the United States Air Force Academy)
- Ada Advocacy material - why Ada is the preferred language for Software Engineering
- JGRASP, a GUI developed by Auburn University (<http://eng.auburn.com/grasp>)

The Ada and Software Engineering Library Version 2 is online at:
<ftp://ftp.cs.kuleuven.ac.be/pub/Ada-Belgium/cdrom/index.html>

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## Booch Components

The Ada 95 Booch Components began in late 1994 when David Weller began a port of Grady Booch's C++ components to Ada95. They are now maintained by Simon Wright and include implementations of

Bags : UBDN  
Collections : UBDN  
    (ordered) : UBDN  
Dequeues : UBDN  
Graphs Directed : U  
    Undirected : U  
Lists Single : U  
    Double : U  
Maps : UBDN  
Queues : UBDN  
    (ordered) : UBDN  
Rings : UBDN  
Sets : UBDN  
Stacks : UBDN  
Trees AVL : U  
    Binary : U  
    Multiway : U

U=Unbounded, B=Bounded, D=Dynamic, and N= Unmanaged refer to the storage allocation mechanisms available for the component. U and D use user-supplied storage pools, B doesn't use dynamic allocation at all, and N uses the default pool. Filtering and sorting operations are supported.

See: [http:// booch95.sourceforge.net/](http://booch95.sourceforge.net/) or

CONTACT: Simon Wright            [simon@pushface.org](mailto:simon@pushface.org)

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## Charles

Charles is a container library for Ada95, modeled closely on the C++ STL. Sequence containers (vectors, dequeues, and lists) store unordered elements, inserted at specified positions. Associative containers (sets and maps) order elements according to a key associated with each element; both sorted (tree-based) and hashed containers are provided. A separate iterator type associated with each container is used to visit container items and to effect direct modification of elements. Charles is flexible and efficient, and its design has been guided by the philosophy that a library should stay out of the programmer's way.

The web site is here: <http://charles.tigris.org>

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## COSMIC

Open Channel Software has entered into an agreement with the National Technology Transfer Center (NTTC) to publish the COSMIC software collection. This collection represents software created by NASA in a wide range of disciplines including engineering, chemistry, aerodynamics, and other areas. In previous years, we featured COSMIC software when it was supported by the University of Georgia Research Foundation.

Many COSMIC programs are "orphaned" and available for "adoption" for someone to moderate user contributions and maintain the site for the application through a Content Management system.

See: <http://www.openchannelfoundation.org/cosmic/>

## DACS

The Data & Analysis Center for Software (DACS) is a Department of Defense (DOD) Information Analysis Center (IAC). The DACS is the DOD Software Information Clearinghouse serving as an authoritative source for state of the art software information and provides technical support to the software community. Many of the links are outdated.

DACS: <http://www.dacs.dtic.mil/>

reuse: <http://www.dacs.dtic.mil/databases/url/key.hts?keycode=15>

Ada: <http://www.dacs.dtic.mil/databases/url/key.hts?keycode=238:249&islowerlevel=1>

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## DATA FUSION LABORATORY

The Data Fusion Laboratory at Drexel University has made a release of its Ada 95 Matrix Math package available to the Ada 95 community. This package targets vector and matrix math operations implemented natively in Ada 95. Many operations, such as determinants, subvectors/matrices, singular value decompositions, inverses, eigenvalues/eigenvectors are supported.

Please refer to the Data Fusion Lab's web page at: <http://dfl.ece.drexel.edu/>

The matrix package is under Research, entitled "Ada95 Matrix Package."

<http://dflwww.ece.drexel.edu/research/ada/>

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## DMOZ

DMOZ is a free, open directory project, with Ada components submitted and maintained by volunteers. Several of the items that we have listed elsewhere in this column are included, although not all of the links are current.

<http://dmoz.org/>

[http://dmoz.org/Computers/Programming/Languages/Ada/Bindings\\_and\\_Libraries/](http://dmoz.org/Computers/Programming/Languages/Ada/Bindings_and_Libraries/)

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## GNAVI.org

The GNU Ada Visual Interface - The Open Source answer to Delphi and Visual Basic

GNAVI is a project to construct an Open Source Rapid Application Development Environment similar to Delphi using Ada. Currently the following are available:

- GNATCOM - Ada bindings to COM/DCOM/ActiveX for Win32 (stable) GWindows Win32 - Windows binding and framework (stable) GWindows OSX - in early Alpha, OS X binding and framework (pre-alpha)
- GWindows GTK for Unix and Linux and GNAVI IDE - the GUI Application builder and RAD Environment are being developed.

For more information see <http://www.gnavi.org> and join the [gnavi-list@gnavi.org](mailto:gnavi-list@gnavi.org)

## GNU

The Free Software Foundation is dedicated to eliminating restrictions on people's right to use, copy, modify, and redistribute computer programs. It promotes the development and use of free software and its documentation in all areas using computers. Specifically, it is maintaining a complete, integrated software system named "GNU". ("GNU" is pronounced "guh-new" and stands for "GNU's Not Unix".)

The word "free" in "Free Software Foundation" refers to freedom, not price. You may or may not pay money to get GNU software, but regardless you have two specific freedoms once you get it: first, the freedom to copy a program and give it away to your friends and co-workers; and second, the freedom to change a program as you wish, by having full access to source code. You can study the source and learn how such programs are written. You may then be able to port it, improve it, and share your changes with others. If you redistribute GNU software you may charge a distribution fee or give it away.

### What is Copyleft?

The simplest way to make a program free is to put it in the public domain, uncopyrighted. But this permits proprietary modifications, denying others the freedom to use and freely redistribute improvements; it is contrary to the intent of increasing the total amount of free software. To prevent this, copyleft uses copyrights in a novel manner. Typically copyrights take away freedoms; copyleft preserves them. It is a legal instrument that requires those who pass on programs to include the rights to use, modify, and redistribute the code; the code and rights become legally inseparable.

The copyleft used by the GNU Project is made from the combination of a regular copyright notice and the "GNU General Public License." GPL is a copying license which basically says that you have the aforementioned freedoms. An alternate form, the "GNU Lesser General Public License" applies particularly to certain GNU libraries. This license permits linking the libraries into proprietary executables under certain conditions. The appropriate license is included in all GNU source code distributions and many manuals.

There are several GNU-associated Ada projects, located at <https://libre2.adacore.com/> including

- The Ada for GNU/Linux Team (ALT)
- The Ada for SCO page.
- The Ada for NetBSDpage.

The GNAT Technology includes the implementation of the ASIS standard (Ada Semantic Interface Specification), [GtkAda](#) to build portable and efficient GUIs in Ada, [AWS](#) (Ada Web Server) the framework to develop Web-based applications in Ada, the [XML/Ada](#) library to process XML streams in Ada, [GLADE](#) to develop distributed applications following the Ada Distributed Systems Annex standards, and [PolyORB](#) to develop distributed applications following the CORBA standard.

Contacts: <http://www.gnat.com/home/>

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|----------------------------------------------------------------|-------------------------------------------------------|
| Free Software Foundation, Inc.                                 | +1 617 542 5942 x 23                                  |
| 59 Temple Place, Suite 330                                     | +1 617 542 2652 (fax)                                 |
| Boston, MA 02111-1307 USA                                      | email: <a href="mailto:info@fsf.org">info@fsf.org</a> |
| See: <a href="http://member.fsf.org">http://member.fsf.org</a> | <a href="http://www.gnu.org">http://www.gnu.org</a>   |

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### Leake components

Stephen Leake maintains the following Ada components:

com ports: An Ada binding, based on Win32Ada, to the Win32 com port facilities.

Stephe's Ada Library: another entry in the Standard Ada Library sweepstakes

Auto\_Text\_IO: automatically generates Text\_IO packages for Ada packages

[http://www.toadmail.com/~ada\\_wizard](http://www.toadmail.com/~ada_wizard)

### **PragmAda Reusable Components**

PragmAda Software Engineering provides the PragmAda Reusable Components, a library of over 60 of the world's finest quality components as free, open-source software available under the GNAT-modified GPL. The components are available at

<http://pragmada.home.mchsi.com/pragmarc.htm>

PragmAda Software Engineering will provide support for the library at very low prices.

CONTACT :      911 South Cedar Drive  
                 Apache Junction, AZ 85220-8440  
                 (480) 983-5634  
                 <http://pragmada.home.mchsi.com/pragmarc.htm>

The PragmAda home page is at  
<http://pragmada.home.mchsi.com>  
with links to both the PragmARCs and the Mine Detector game. The e-mail address is  
[pragmada@mchsi.com](mailto:pragmada@mchsi.com)

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SIGAda

Be sure to check the web pages of SIGAda at
<http://www.acm.org/sigs/sigada/>

In particular, see SIGAda's links to different software repositories.
<http://www.acm.org/sigs/sigada/resources/links.html>

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### **Swiss Federal Institute of Technology**

The Software Engineering Laboratory (LGL) at the Swiss Federal Institute of Technology at Lausanne (EPFL) maintains pointers to Ada Resources: These include:

- The Ada 95 Reference Manual
- LGL Ada Component Library
- GLADE Filter Add-Ons
- Ada 95 Pretty Printer based on ASIS
- GNAT User's Guide

See: <http://lgl.epfl.ch/ada/index.html>  
<http://lgl.epfl.ch/index.html>

Also see Ada In Switzerland, <http://www.ada-switzerland.org/>, the web site of the interest group of the Swiss Informatics Society (SI)

## USAFA

The US Air Force Academy maintains an Ada software repository. USAFA mostly distributes Ada tools (such as A#, AdaGIDE and RAPID). More information on RAPID is in Ada Letters (proceedings of SIGAda '99). The GUI libraries are an example of reusable code. In addition, the USAFA repository includes the following software:

Parallel : A binding to use the parallel port under Windows 95/98.

Serial : A binding to use the serial port under Windows 95/98/NT.

Mcc-Sounds : A binding to play .WAV files under Windows 95/98/NT.

An elementary graphical replacement for Ada.Text\_IO.

AdaGOOP: An automatic object-oriented parser generator

Adagraph : a modified version of Jerry van Dijk's Adagraph

Fortran to Ada Translator donated by Oliver Kellogg (DaimlerChrysler Aerospace, Ulm Germany), implemented as a perl script

AdaGide, a leading open-source IDE for Ada under Windows, now includes A#, an Ada compiler for the Microsoft .NET platform. A# also has been integrated into Visual Studio 2005.

See:

<http://adagide.martincarlisle.com>

[http://www.martincarlisle.com/ada\\_stuff.html](http://www.martincarlisle.com/ada_stuff.html)

<http://asharp.martincarlisle.com>

<http://rapid.martincarlisle.com>

CONTACT: Martin C. Carlisle,  
Professor of Computer Science  
US Air Force Academy  
[Martin.Carlisle@usafa.af.mil](mailto:Martin.Carlisle@usafa.af.mil)

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Mats Weber's Component Library

The components in this library fall into four main categories. The most useful may be the data structures, which were written to be as versatile as possible.

- Data Structures (Bags, Tables, Queues, Stacks, Lists, etc.)
- Math (ZpZ_Field, Polynomials, Permutations, Linear_Programming, etc.)
- Ada Programming Tools (Makeup_Ada_File, Ada_Lexical_Analyzer, etc.)
- OS Interface (CPU, VMS_File_Names, etc.)

These components are for Ada 95 and generally will not compile with Ada 83, but if you need to use them in an Ada 83 environment, almost all you will have to do is remove the (<>) in generic formal types where appropriate.

CONTACT:
http://mats.weber.org/ada/mw_components.html
mats@weber.org

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