the brl-cad project

 Theme of writing this document:-

* To make it clear to someone who is new to"BRL-CAD PROJECT" .
* What are possible ways one can get involved and contribute to BRL-CAD.

There may be many questions regarding BRL-CAD like:-

 1.What is BRL-CAD PROJECT ?

 2. What are the uses of BRL-CAD and its services?

 3. History of BRL-CAD?

 4. Who can get invovled and contribute to BRL-CAD?

 5. What are possible ways of contributing to BRL-CAD

 and their resepective uses one may get form

 contributing?

 6. Additional ways for contributing to BRL-CAD?

 7. Suggestion to contributers?

 Let us see the answers to the above questions:-

**1. BRL-CAD is a constructive solid geometry (CSG) solid modeling computer-aided design (CAD) system.**  BRL-CAD (pronounced be-are-el-cad) is a powerful, cross-platform, open source solid modeling system that includes

* Interactive three-dimensional (3D) solid geometry editing high-performance ray tracing support for rendering and geometric analysis.
* Network-distributed framebuffer support,image and signal- processing tools.
* Path tracing and photon mapping support for realistic image synthesis.
* A system performance analysis benchmark suite, an embedded scripting interface, and libraries for robust high-performance geometric representation and analysis.
* Overall, BRL-CAD contains more than 400 tools, utilities, and applications and has been designed to operate on many common operating system environments including **BSD, Linux, Solaris, Mac OS *X, and Windows*.**
* The package is distributed in binary and source code form as Free Open Source Software (FOSS), provided under Open Source Initiative (OSI) approved license terms.

 **2.** The solid modeling system is frequently used in a wide range of

* Military, academic, and industrial applications including in the design and analysis of vehicles, mechanical parts, and architecture.
* The package has also been used in radiation dose planning, medical visualization, computer graphics education, CSG concepts and modeling education, and system performance benchmark testing among other purposes.

**Few services rendered by BRL-CAD are:**

* **For more than two decades, BRL-CAD has been the primary solid modeling CAD package used by the U.S. government to help model military weapons systems for vulnerability and lethality analyses .**
* BRL-CAD has been under active development with a portability heritage that includes systems such as
1. DEC VAX-11/780 running 4.3 BSD
2. DECStations running ULTRIX
3. Silicon Graphics 3030, 4D "IRIS", O2, Onyx, and Origin systems running various versions of IRIX
4. Sun Microsystems Sun-3 and Sun-4 Sparcs running SunOS
5. the Cray 1, Cray X-MP, Cray Y-MP, and Cray 2 running UNICOS and much more.

**3. In 1979, the U.S. Army Ballistic Research Laboratory (BRL) – now the United States Army Research Laboratory – expressed a need for tools that could assist with the computer simulation and engineering analysis of combat vehicle systems and environments. When no CAD package was found to be adequate for this purpose, BRL software developers – led by Mike Muuss – began assembling a suite of utilities capable of interactively displaying, editing, and interrogating geometric models. This suite became known as BRL-CAD. Development on BRL-CAD as a package subsequently began in 1983; the first public release was made in 1984. BRL-CAD became an open-source project on 21 December, 2004.**

**4.** Whether you are a developer, documenter, graphic artist, academic, or someone who just wants to be involved in a unique open source project, BRL-CAD has a place for you.

* Contributors come from all over the world and use their diverse backgrounds and talents to help maintain and enhance one of the oldest computer-aided design (CAD) packages used in government and industry today.

**5.** There are numerous ways to contribute to the BRL-CAD project.

Let us look at some of the ways in which you can contribute to BRL-CAD.

**Developers:**

Regardless of your level of experience as a developer, you can help the BRL-CAD project. In addition to creating your own task, the BRL-CAD provide various lists of work needed:

* The Deuces List: These small but important tasks (<http://brlcad.org/wiki/Deuces#Code>) are estimated to take 2 hours or less to complete.
* USE- These tasks are a way to begin building familiarity with BRL-CAD while at the same time completing useful work.
* Contributor Quickies: If you're a new contributor, take a look at our list of quick projects (<http://brlcad.org/wiki/Contributor_Quickies#Code>). These tasks, which are estimated to take approximately 1 to 4 days to complete, are more work than the deuces.
* USE- These tasks will also build deeper understanding of the code.
* Source Code Clean-Up: The BRL-CAD source code is large and contains a lot of history.
* USE-Cleaning up the sourcecode (<http://brlcad.org/wiki/Code_Cleanup>) will help to improve the code's quality and maintainability.
* TODO Lists: Taking on an item from the list of project ideas (<http://brlcad.org/~sean/ideas.html>) or the TODO list (<http://sourceforge.net/p/brlcad/code/HEAD/tree/brlcad/trunk/TODO>) will generally take considerably more time to complete and some of them may involve major research and coding efforts.

**Documentors:**

If you don't write code, you can still become a valuable contributor to BRL-CAD by helping to write, update, and improve the project's documentation. Starting points include:

* Documentation Deuces

(<http://brlcad.org/wiki/Deuces#Documentation_and_Training>).

* Documentation Contributor Quickies

(<http://brlcad.org/wiki/Contributor_Quickies#Documentation>).

* Documenting While Learning: If you are learning a specific tool for BRL-CAD (say, for example, the rt raytracing program) and find that the existing documentation doesn't provide you with the information you were wanting, it is often a good approach to write a tutorial for the command as you are learning to use it.
* Converting to DocBook: Many older documents in the BRL-CAD source archive were written prior to the adoption of DocBook as our primary format. Converting existing documentation to the DocBook format
* USE-It is an excellent way to familiarize oneself with editing DocBook and at the same time improve BRL-CAD's documentation.

**6.** So if you don't code or write documentation? That doesn't matter. You can still contribute to the BRL-CAD project. Other areas in which BRL-CAD need help include:

* Bug Reporting and Feature Requests

Finding bugs in software is often a challenging task for developers. If you find a problem with the software, file a bug report on BRL-CAD's official bug tracking page on SourceForge (<http://sourceforge.net/p/brlcad/bugs/>). Please remember to provide enough detail so that they can reproduce the problem. You can also post to developer mailing list at brlcad-devel@lists.sourceforge.net.

* Outreach and Artwork

BRL-CAD need professional-quality artwork. Everything from logos to diagrams to icons. And just about anything in between. Your efforts will help give BRL-CAD a more polished look and will support our outreach and marketing efforts.

You can find a list of outreach and artwork tasks that will get you started at the BRL-CAD website (<http://brlcad.org/wiki/Contributor_Quickies#Outreach>).

* Quality Assurance

Testing is a vital part of the software development process.What can you do? Create testing frameworks and tests for specific portions of the code. Or go through BRL-CAD's graphical user interface and find and report any bugs. You can help make BRL-CAD better by reporting any problems you encounter.

You can find a list of quality assurance tasks that will get you started at the BRL-CAD website (<http://brlcad.org/wiki/Contributor_Quickies#Quality_Assurance>).

* Research

BRL-CAD improves not just through rigorous coding and quality assurance but also through research. We need contributors who can study problems with the software and recommend solutions based on their research. This is an area which typically requires a solid level of technical ability, but contributions here can have an enormous positive impact on the software.

You can find a list of research tasks that will get you started at the BRL-CAD Website (<http://brlcad.org/wiki/Contributor_Quickies#Research>).

* Translations

BRL-CAD want to make it available to as many users as possible, regardless of what language they speak. To that end, they are steadily making the software available in a number of languages. But there's still work to do. If you have a knowledge or one or more languages other than English, they can use your skills.

You can find a list of translation tasks that will get you started at the BRL-CAD website (<http://brlcad.org/wiki/Contributor_Quickies#Translation>).

* User Experience

BRL-CAD is a large, powerful, and complex piece of software. And as with any software package, it can always be made more consistent, usable, and user friendly. If you're willing to learn the user interface and to approach the package with a critical eye, then you can help make the BRL-CAD user interface friendlier and more consistent.

You can find a list of user experience tasks that will get you started at the BRL-CAD website (<http://brlcad.org/wiki/Contributor_Quickies#User_Interface>).

**8.** As there are many ways to get started with BRL-CAD, . More than likely,if there is some new goal you already have in mind, be it a new geometry converter, support for a different image type, a fix to some bug, an update to existing documentation, a new web page, or something else entirely.

Regardless of the goal or contribution, it is highly encouraged that you interact with the existing developers and discuss your intentions. This is particularly important if you would like to see your modification added to BRL-CAD and you do not yet have contributor access. When in doubt, working on resolving existing bugs, improving performance, documentation, and writing tests are perfect places to begin.All contributors are encouraged to participate in any of the following communication channels:

1. Internet Relay Chat (IRC)
2. E-mail Mailing Lists

 c. On-line Forums dedicated to BRL-CAD development and

 project communication

Participation in Organized Third-Party Events

While BRL-CAD does not participate in all of these projects every year, we do make a substantial effort to participate in programs that offer opportunities for new contributors to work on BRL-CAD. The following are programs that we have participated in over the last few years. And keep watching the BRL-CAD website for news of new programs to come.

Google Summer of Code: Since 2008, BRL-CAD has been a participant in the Google Summer of Code (GSoC), a Google-funded program that allows students to write code for open source projects. Resources specific to BRL-CAD's participation in previous GSoC programs are available at <http://brlcad.org/wiki/Google_Summer_of_Code>.

Google Code-In: Google Code-In

(<https://developers.google.com/open-source/gci/>) is an annual contest for high school and pre-secondary students that encourages them to participate in the development and maintenance of open source software. BRL-CAD participated in this project in 2012 (<http://brlcad.org/wiki/GCI_Tasks>).

European Space Agency (ESA) Summer of Code in Space:

BRL-CAD has also participated in The European Space Agency's Summer of Code in Space; see <http://brlcad.org/wiki/ESA_Summer_of_Code_in_Space>.