



## iRODS client for ImageJ

### 1. Executive summary

**ImageJ** is a [public domain](#), [Java](#)-based [image processing](#) program developed at the [National Institutes of Health](#). ImageJ was designed with an [open architecture](#) that provides [extensibility](#) via Java [plugins](#) and recordable macros.<sup>[3]</sup> Custom acquisition, analysis and processing plugins can be developed using ImageJ's built-in editor and a Java compiler. User-written plugins make it possible to solve many image processing and analysis problems .

Our Mission in summer of code to design a macro-compatible plugin for ImageJ that can to and fro transfer data from iRODS and then integrate it with **DropBox Account** plugin that was previously made .

### 2. The Project

**The aim of this project is to develop an ImageJ plugin so that user( an iRODS client ) can upload / download datasets from iRODS . And it also provides GUI for simplicity of a user .**

#### 2.1. How are you going to implement it?

As an implementation part first, I use the **Jargon Core API's** so that we can



easily upload / download the data to and fro from iRODS. Data can be any type or format like (binary files , text files or folder tree ).

**Jargon-core API's** implements the iRODS protocol, and allows development of iRODS-enabled Java applications. This API is especially useful for developing mid-tier applications and services, as well as desktop-clients (such as drop). These libraries also provide a foundation for a new set of interfaces that will come with iRODS.

For adding a GUI to the plugin, I will use **AWT** or **Swing** components like Text Fields, Label, Buttons etc. By using AWT APIs and Swings. We can also use **Generic Dialog class as build a plugin** and plugin will be **macro - compatible** with this or we can use it like traditional way.

### 2.2. Detailed description of the approach

#### - **Functionality / tasks**

- After reading the Jargon core API's I found some of the important Jargon library that helps us to transfer data to and fro from iRODS . **If I am selected for this project, I will send the mentor a demo implementation of RESTful webservice with Jargon to transfer data to and fro from iRODS before summer of code started** . It is the core functionality of the project .

- As I am still working and learn about Jargon APIs some, I observe that

- Firstly , there are approx. 10 libraries in Jargon API's each one has its own function so firstly we use **Authenticate our connection with iRODS** using **Jargon-core library( base library for implementing the protocol )** which contain several methods for implementing the **connection-authenticating** methods in **AuthenticationConnection** class etc. and use initialize connection methods in **such as initializeConnection() methods** in **Connection Class** .

- Then we can check our connection by using **Jargon Data Utils library** in which we can use **Connection Tester Class** for implementing the above features .

- Then we can use **Jargon Data Utils library** again for adding the functionality to manage the iRODS data such as building the tree



using **TreeUtility** class methods .

- For any type of Account information / Profile Information we may use **Jargon User Profile library** .
- **IMP part** for uploading or downloading a directory from iRODS we use **getUploadDirectory()** or **deleteUploadDirectory()** method in the **JargonDataUtils** library .
- For downloading a file from iRODS we use **getFile()** methods from **Jargon Data Utils** library . For rest of the API's, we required we can further Reference **from the Google** .

Lastly, for adding GUI to the plugin we design it like a traditional way or as Mentors wishes . We may use **GenericDialogClass** for **macro - compatible** plugin . Later We Integrate the plugin with DropBox account plugin was previously made .

### 3. Implementation

#### 3.1. Minimal set of deliverables

1. The project will be an ImageJ plugin. It could be easily integrated in the ImageJ available public ally to use by anyone and may be it will be apart of ImageJ2 .
2. All the source code is publicly available so later if anyone can develop some more it was available to him easily on my GitHub account .
3. All the paper documents also publicly available so that anyone can use it for understanding the code .

#### 3.2. Timeline / tasks deliverables

##### 1. May 25 – June 10 ( 2 Weeks )

First our focus is to create an ImageJ plugin which allows user to



transfer their data to and fro from iRODS by building the suitable methods for this using RESTful webservice with JSON as it is light weighted and modern also . And finally integrated with ImageJ .

**2. June 11 – June 30 ( 3 Weeks )**

Add a Graphical User Interface (GUI) to the plugin so that user can easily upload / download any files ( binary files , text files , folder trees ) etc .

**3. July 1 – July 21 ( 3 Weeks )**

Minimizing the code and merging the plugin of DROPBOX made previously into our plugin and combining the code suitably .

**4. July 22 – August 5 ( 2 Weeks )**

Testing the projects and try to fix the major bugs and if possible, try to implementing some more functionality if possible . And also testing on the different platforms like Windows , Mac , Linux .

**5. August 6 – August 12 ( 1 Week )**

Provide on paper decryption for the project and examples . It all includes paper work finally DONE !!!! .

**3.3. How will you communicate with the mentoring organization?**

I used to communicate via through Gmail or Google Hangouts .  
Email: bbhopalw@gmail.com

**3.4. Are you interested to further support the project after the end of the fellowship?**

Yes, definitely I am interested to further support the project after the end of the fellowship infect, I decide the future idea also , that why not after this project we alsodesign plugin for Google Drive ( by Drive REST API's ) it's also possible .



### 4. The candidate

#### 1. What is your motivation for the specific project?

After 1<sup>st</sup> year when my summer holidays begin, I used to develop online portals , making JAVA application ( Desktop + web ) . So, in the summer holidays I always try to build something innovative and those things which brush my programming skills also . By the time I was aware about Go so I thought that why not contribute our programming skills for Open-Source Project . Hence my motivation is to build something good and contribute to open-source community

#### 2. Is this the only project that you are interested in?

“Quality over Quantity” is somewhat I believe so I am only interested in this project as it is best suiting my programming personality .

#### 3. What makes you a good candidate for the project?

Because this project mainly required GUI interface and a RESTful webservice implementation ( by using the Jargon Core API's ) this is something is that my best part . And hence it the major reason why I make the proposal and send it to you .

#### 4. Experience

##### a. Do you have experience in Java

Yes , I hold a good experience of developing the JAVA desktop application mainly (since my last internship at HCL) and web application (servlest) too.

As this project is mainly a desktop application. I have made some of the good desktop application ( Snake Game , Online Bank , Registrations GUI ) in the past.

In addition, a major part of this project is to implement RESTful webservices( with JAX-RS ) with JSON , I am already familiar with Webservices and I send some of my build webservicesproect and simple JSON project along this also.

##### b. Do you have experience in ImageJ

Yes , a little bit because when I was learning java (Swings and AWT) we alwaysuse to learn about ImageJ because it is also a Java Desktop Application . I am doing adhoc tasks on ImageJ such as counting cells ,nano particle for POC purposes -





size distribution etc. and I am also started to learn more about ImageJ by seeing the demo videos from here [Click Here](#). Before Summer of code, I will make sure that I am quite comfortable in ImageJ.

**5. Will you be working full time?**

During summer holidays I am completely available for GSoC . I planned to devote 30-40 hrs/week as per the timeline. per week .

**6. CV**

Please download/access my CV from here [Click Here](#) .