

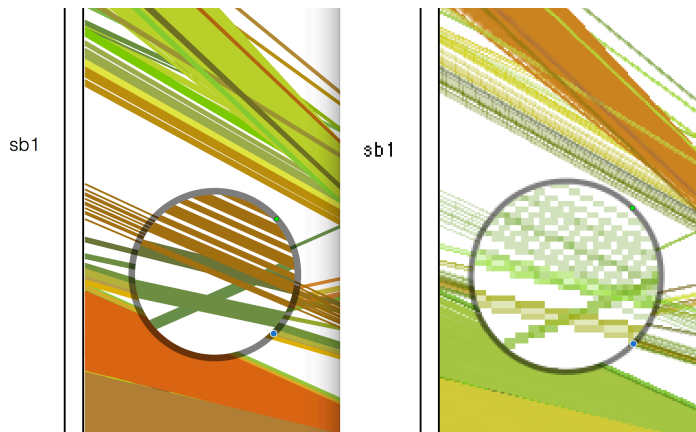
# VGSC Manual

Version 1.1

## I. Introduction

This is a software package to generate different kinds of plot in order to enhance the downstream analysis for synteny and collinearity study. The features of this package including:

- Support for Vector Graphic Image formats
- More raster image formats
- Easier parameter setting
- Corss-platform



## II. Execution Guideline

### 1. System requirements and dependencies

VGSC is Java-based, so it is compatible with all the operating system with a full installation of java runtime environment (JRE). For security reason, we recommend to update JRE to the latest version, and the minimum requirement is JRE version 1.8.0.

## 2. Preparing the data

You need to prepare the following data to run the package:

(1) Synteny and Collinearity file: This package operate the pre-processed synteny and collinearity data, which are normally from the common synteny and collinearity analysis software packages, such as MCScan, MCScanX and etc. A sample data is as follow:

0-	0:	Os01t0584200	Os01t0713850	7e-15
0-	1:	Os01t0584900	Os01t0714800	2e-30
0-	2:	Os01t0588200	Os01t0715500	9e-12
0-	3:	Os01t0589200	Os01t0716500	7e-62

As shown, the first column is the correspondence of the genes, connecting two positions with minus mark; the second and third column are the source and target position of the relationship; and the forth column is the E-value for this line.

(2) Gene Annotation File: This file provide the fundamental map for the plotting, which is widely used in gene assembling software and gene databases. The file format we used here is GFF3(<http://gmod.org/wiki/GFF3>).

(3) Environment Setting: A Java environment is mandatory, as well as a suitable JRE version.

## 3. Setting the parameters

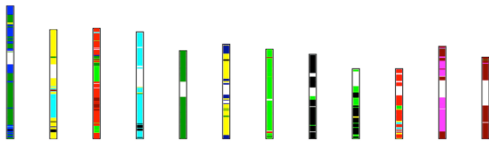
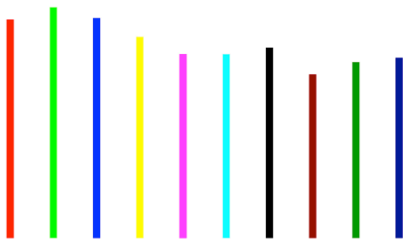
The parameters for this package is as follow:

```
java -jar VGSC.jar -tp Plot_TYPE -ig GFF_FILE -is SYNTENY_FILE -ic CONTROL_FILE  
-os OUTPUT_FILE
```

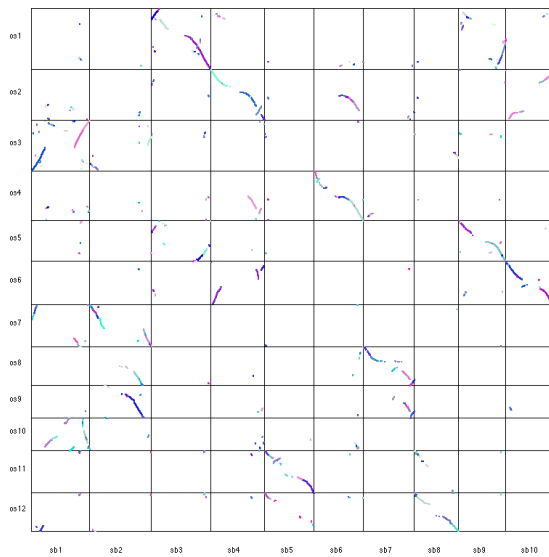
其中,

(1) -tp Plot\_TYPE is the type of the plot, it such be one of following four:

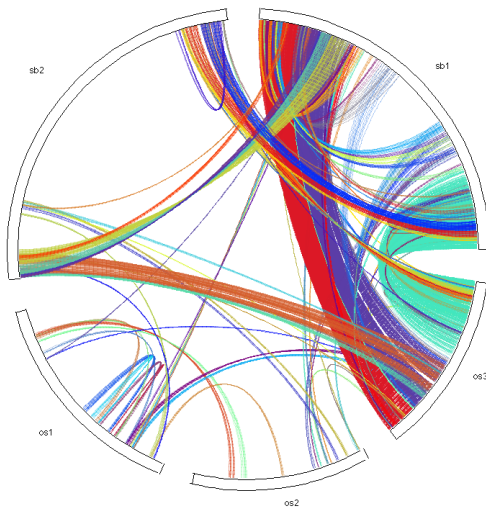
a. Bar Plot



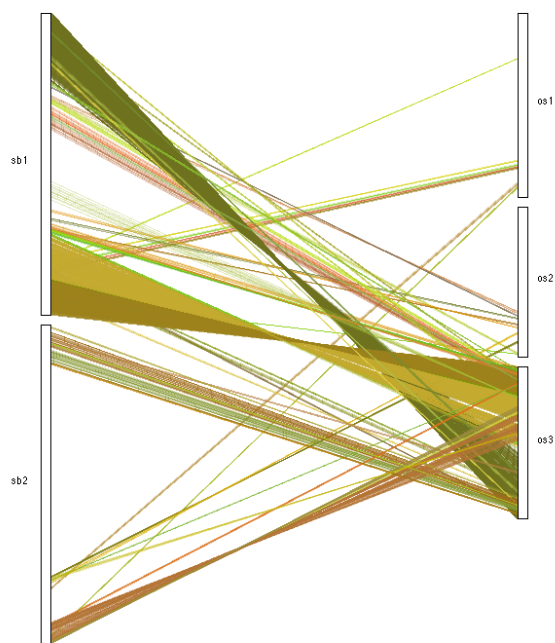
b. Dot Plot



c. Circle Plot



d. DS Plot



- (2) -ig GFF\_FILE is the input file of gene annotation;
- (3) -is SYNTENY\_FILE is the input syteny file;
- (4) -ic CONTROL\_FILE is the input control file;
- (5) -os OUTPUT\_FILE is the output file.

## 4. Configuring the output

This package supports multiple output formats, including:

Raster Images: BMP, JPG, PNG

Vector Graphics Images: EPS, SVG, PDF

There is no strict configuration for choosing the format. It is as easy as using the file extension name, and our algorithm will match the option automatically to implement the running.

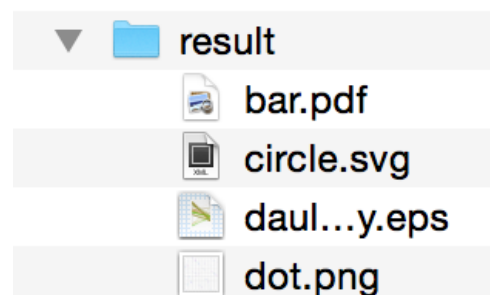
## 5. Sample

This package includes a terminal sample script, type `./run_example` to run.

The main frame of the sample are:

```
java -jar VGSC.jar -tp Bar -ig sample/os_sb.gff -is sample/os_sb.collinearity -ic
sample/bar.ctl -os result/bar.pdf
java -jar VGSC.jar -tp Dot -ig sample/os_sb.gff -is sample/os_sb.collinearity -ic
sample/dot.ctl -os result/dot.png
java -jar VGSC.jar -tp Circle -ig sample/os_sb.gff -is sample/os_sb.collinearity -ic
sample/circle.ctl -os result/circle.svg
java -jar VGSC.jar -tp DualSynteny -ig sample/os_sb.gff -is
sample/os_sb.collinearity -ic sample/dual_synteny.ctl -os result/daul_synteny.eps
```

And the result would be four images in different types and formats, saving into the *result* folder, see the graph below.



### III. FAQ

#### 1. Is it possible to parameterize the color or font of the output image?

In fact, in an early version of VGSC, we provide the detailed parameter system for customizing the color; however it complicated the usage, because most of the users of this application are scientific researchers rather than artists. Therefore, we simplify the process: pick a sophisticated color randomly and calculate the contrasting color for comparative items. For those advanced users, a major update with full customizing options is in a coming version.

#### 2. How to open the image files that VGSC generates?

VGSC can produces a range of output formats, most of which is natively supported by common operating system, such as jpeg, bmp, and pdf. Here we list some image viewer if applicable:

	Windows 7	Ubuntu Desktop 1404	Mac OS X 10.10
BMP	Paint*	Image Viewer*	preview*
JPEG	Paint*	Image Viewer*	preview*
PNG	Paint*	Image Viewer*	preview*
SVG	<a href="#">Adobe SVG Viewer</a>	Image Viewer*	<a href="#">Gapplin</a>
EPS	<a href="#">GSView</a>	Document Viewer*	preview*
PDF	<a href="#">Adobe Acrobat Reader</a>	Document Viewer*	preview*

\*: System native application

Also, all the output files are compatible with the web browser Chrome and Firefox, so it is the most convenient way. Enjoy.