Preface and Acknowledgments

The Decision Aids for Tunneling (DAT) and the associated computer codes, SIMSUPER and SIMJAVA, have been developed over a period of over 20 years. Numerous people contributed to this and many sponsoring agencies were involved.

Initial work was done by Steven Vick and later by Mark Chan and Guillermo Salazar with help from Daniele Veneziano, David Ashley, Mike Markow, Fred Moavenzadeh and Herbert H. Einstein. The present version of SIMSUPER was developed by the authors. Other contributions came from Vijaya Halabe, George S. Kalamaras, Shulin Xu, Sarah Bush, and Christina Kollarou. The first version of SIMJAVA was created by Cédric Marzer and the current web-based SIMJAVA was developed by Claude Indermitte. The SIMSUPER user’s manual was written with the help of Jennie Hango, Nicole Balli and revised by Christoph Haas. The SIMJAVA user’s manual is based on the work done for the SIMSUPER user’s manual. It was written by the authors listed on the title page.

The many sponsoring agencies are: in the US: National Science Foundation, MIT Portugal Program; in Switzerland: European project NeTTUN, Federal Office for Transportation and Swiss National Science Foundation; in Italy: Geodata; and in Korea: the Korea Railroad Research Institute. Also, the two universities at which the work was done, MIT, and EPFL, provided essential support.

The DAT in their present form are intended to serve practicing engineers, managers and students as well. The way the user’s manual is written reflects this.
1. Introduction

This manual describes the use of SIMJAVA which is a graphical user interface to implement the Decision Aids for Tunneling (DAT).

SIMJAVA is a preprocessor and postprocessor for SIMSUPER that can be used to input data and display outputs replacing the SIMSUPER standard graphical user interface. The actual simulations are performed by SIMSUPER which is the core computer code of the DAT. SIMSUPER is coded in C/C++ for Unix/Linux and XWindows. In contrast, SIMJAVA is programmed in JAVA; nevertheless, it is perfectly compatible with SIMSUPER since SIMJAVA uses the same data structure as SIMSUPER.

The main advantage compared to SIMSUPER is that SIMJAVA is easier to use with a user-friendly graphical interface and can run not only on Unix/Linux platforms but also on Windows or Mac operating systems. In addition, SIMJAVA is a web-based program which allows the user to access and use it very easily through the internet. The relation between SIMJAVA and SIMSUPER, and the tasks which can be performed with SIMJAVA and SIMSUPER, are shown in Figure 1-1. As shown in this figure, one must transfer the input data from the SIMJAVA interface to SIMSUPER in order to run simulations. Similarly, if one wants to present results (i.e. output of the simulations) with the SIMJAVA interface, one must transfer the output data back to the SIMJAVA interface. As shown in Figure 1-1, SIMJAVA needs a web server to import/export the data on the web between the SIMJAVA interface and SIMSUPER and save all the input/output data, which can be displayed in the SIMJAVA interface. The on-line data transfer through the internet using the SIMJAVA server is indicated by the solid arrows in Figure 1-1. The input/output data, however, can be directly transferred between SIMSUPER and the SIMJAVA interface without the SIMJAVA server if the user runs SIMSUPER on the local machines (i.e. off-line). The dashed arrows refer to the off-line data transfer between the SIMJAVA interface and SIMSUPER in the local mode. The data transfer in SIMJAVA will be explained in detail in Section 2.3.

To obtain more information about the DAT and SIMSUPER programs, the reader is referred to the SIMSUPER user’s manual (Indermitte and Einstein 2000).

Figure 1-1 Relation between SIMJAVA and SIMSUPER

[( ) indicates aspects of SIMSUPER which are not used if SIMJAVA is used as user interface]
2. Data Input

2.1 Preparation before Starting SIMJAVA

The user needs to check two things, which have to be installed on the user’s local machine before starting SIMJAVA:

Java run time environment - One needs to install “JAVA” (Java run time environment) on one’s local machine (if the user runs SIMJAVA on MIT Athena, one does not need to install this program since this is already installed on Athena). The “Java run time environment” can be downloaded from the web site at http://java.sun.com.

Java policy - Java has a protection policy for everything that runs on the local computer. So the user has to grant java permission to access all the different resources. In order to do this the user can use the tool, “policy tool” provided by © Sun Microsystems or he/she can create and edit a file called “.java.policy” in his/her main directory. The main directory is the user’s home directory that he/she accesses when he/she logs into MIT Athena. On Windows or Mac, the main directory could be the directory where the java installation has been installed (e.g. C:\ or C:\Windows). In order to create and edit the “.java.policy” file, the user just copies the lines below into the user’s main directory and java should work. On Windows7, the main directory is C:\users\’user_name’.

grant {
    permission java.util.PropertyPermission "*", "read, write";
    permission java.lang.RuntimePermission "modifyThread";
    permission java.lang.RuntimePermission "modifyThreadGroup";
    permission java.lang.RuntimePermission "preferences";
    permission java.io.FilePermission "<<ALL FILES>>", "read, write, delete, execute";
    permission java.awt.AWTPermission "accessClipboard";
};

After the user has installed “JAVA” and “java policy” on his/her local machine during the first use of SIMJAVA, he/she doesn’t need to install them again.

2.2 Starting up

2.2.1 How to Run Simjava

SIMJAVA can be run on two different working environments.

The user can use Firefox or Mozilla on Athena, or Firefox, Mozilla or other internet browsers on PC or Mac to run Simjava.

If one runs SIMJAVA on one’s PC or Mac:
   Start one of the internet browsers (e.g. Firefox, Mozilla, Netscape, Safari).

If one runs SIMJAVA on Athena at MIT:
Type at the athena% prompt:
athena% firefox &
or
athena% mozilla &
This will start firefox or mozilla.

Then simply follow the following steps to start SIMJAVA:

Go to  http://ceeserver3.mit.edu/simsuper/username/

A window will appear to ask the user ID and password (see Figure 2-1).

![Figure 2-1 User Verification Window](image)

Once the user is verified, a new window shown in Figure 2-2 will appear. To start the program, click the line “Main Program” shown in the upper left part of the window (Java may ask once again for the user ID and password). It is also possible to view this manual online by clicking the “Manual (html)” or the “Manual (pdf)” link under “Main Program”.

![Figure 2-2 “Welcome to Simjava” Window](image)

### 2.2.2 Initial Window

Once the “Main Program” option has been selected and loaded, an initial window with a simple menu is available as shown in Figure 2-3.
2.2.2.1 Working Mode

SIMJAVA has two working modes: “Local” and “Remote” (see Figure 2-4). In the local mode, all data will come from and go to the user’s local computer, while all data will go to and come from the server in the remote mode. The way of importing or exporting a data set and running simulations will be different in SIMJAVA, depending on which mode the user chooses, and on which local machine (e.g. Athena or PC) the user runs SIMJAVA.

Note that local mode is not always available. Java security prevents web applets from writing and reading on a local computer and thus permissions have to be defined to allow an applet to do that. Please refer to the java “policynool” pages from Sun to set the desired permission. See also chapter 2.1 (Java Policy).
2.2.2.2 Saving Mode

SIMJAVA has three saving modes: “Simsuper”, “Excel” and “XML” (see Figure 2-5).

![Figure 2-5 Initial Window with Saving Mode](image)

Data are normally saved under the Simsuper format. It is however possible to save some data in an XML format or in Excel format. Note that since Simsuper is only able to read Simsuper format, XML and Excel formats are only being implemented to improve clarity of data files and possibly compatibility with other programs.

When XML is selected, some files will be written in XML format instead of Simsuper format (while keeping the same name). For example the file “delay_save” in Simsuper format looks like

10
20
-1

while the XML format will look like:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<Data>
  <Delays> 10 </Delays>
  <Delays> 20 </Delays>
</Data>
```

When Excel is selected, some files will be written in Excel files instead of in Simsuper (while keeping the same name).
References


Einstein, H. H. Risk Assessment and Management in Geotechnical Engineering, Keynote Lecture, Proc. 8th Portuguese Congress for Geotechnique, Lisbon, April 2002


Min, Sangyoon. The application of “Decision Aids for Tunneling (DAT) to the Sucheon tunnel in Korea”, Massachusetts Institute of Technology, Department of Civil and Environmental Engineering, MIT thesis, 2003.


