

GETTING STARTED WITH UCODE 3.02

These installation instructions are written in a general manner but are biased to installation on a fairly modern PC. Please consider the process and make adjustments as necessary for your machine. If you have trouble, you are welcome to contact epoeter@mines.edu with questions.

You need the Perl interpreter in order to run UCODE (~approximately 30Mb) but you do not need much of it, so you can install a minimal amount as follows:

1. Install Perl on your machine

a) go to <http://www.ActiveState.com/Products/ActivePerl/Download.html>

You may need to download the installer software for your system first. If so, right click on it and save it in the wrdapp directory. Then, from the same web page, right click on the perl version for your system and save it to the wrdapp directory. Then double click on the perl installation file in your wrdapp directory and the installer will begin.

b) after accepting terms, browse for the location where you would like to install perl and follow the directions to download Active Perl to your computer

note: to minimize the amount of space required on your machine, carefully deselect items during installation, that is select to install Perl on local hard drive, and for examples and documentation select that entire feature will be unavailable

c) select to add Perl to the path environment and select to create Perl file extension association

d) if c) was successfully implemented on your computer, your command line need only include: `ucode.pl "rootname"` flag

Sometimes it is not successful and this can be surmounted by using complete path references to each code

e) continue to the end of the installation process

2. Install & Run UCODE

a) if you unzipped the files and are reading this then UCODE is already installed, but you may prefer to also specify a path to it to make your life easier. Note: Perl must have been installed before UCODE can be executed. Remember that UCODE always runs `mrdrive.exe` and this is specified in your `*.uni` file so you may need to update the path to `mrdrive` in the `*.uni` files if you use something other than the directory structure provided. When unpacked from the zip file, the `*.uni` test files include a relative reference to `mrdrive` at `..\bin\mrdrive` within the `wrdapp\ucode3.06` directory.

If you do not want to set a path to UCODE on your computer, then you can run it by:

1) executing UCODE from a directory where you have created input files by either creating a batch file containing the command line or typing the command line into a command window as follows:

```
C:\perl\bin\perl C:\wrdapp\unicode3.06\bin\unicode.pl "rootname_for_your_files" "flag_to_manage_window"
```

If you completed item 1 (Install Perl on your machine) as described above, then you will not need to specify that UNICODE is a Perl code nor will you need to specify the path to Perl and the command line will be:

```
C:\wrdapp\unicode3.06\bin\unicode.pl "rootname_for_your_files"
"flag_to_manage_window"
```

So if you name your UNICODE files, my.uni my.pre ... and you want to keep the UNICODE window open to see if error messages appear, your command line will be:

```
C:\wrdapp\unicode3.06\bin\unicode.pl my 1
```

b) if you want to create a path to UNICODE, assuming you unzipped it to C:\, then the path should be C:\wrdapp\unicode3.06\bin, use the help portion of your operating system to determine how to set a path, or have your computer administrator assist you in creating paths to:

```
C:\wrdapp\unicode3.06\bin\unicode.pl and C:\wrdapp\unicode3.06\bin\mrdrive.exe
```

After creating a path, if you name your UNICODE files, my.uni my.pre ... and you want to keep the UNICODE window open to see if error messages appear, your command line will be:

```
unicode.pl my 1
```

c) remember that UNICODE always runs mrdrive.exe and this code is specified in your *.uni file so if you change the location of unicode and mrdrive you will need to update the path to mrdrive in the *.uni test files.

d) you can check your installation by double clicking on C:\wrdapp\unicode3.06\test\test.bat
If the code does not run successfully, check all paths and review the path references in the test.bat file. The test.bat job takes UNICODE through all phases and saves the output from each in the test directory. Clean.bat will remove all the files that are created if the run is successful. If the run fails, some scratch files may be left behind. The other test directories will only function after setting up your network to function in parallel mode and changing the *.ini files to reference the proper master and slave directories.

3. Sometimes changes to perl are not back compatible. If you find that UNICODE will not run with the version of perl you download: Unzip the few perl exe and dll files contained in p.zip to the wrdapp\unicode3.06\bin directory. Change the commands in the test.bat file from:
perl ..\bin\unicode.pl test 0
to:
..\bin\perl ..\bin\unicode.pl test 0

4. What's new in UCODE3.06

New input in UCODE3.06 is delineated in:

UCODE3.06 _MANUAL_ADDITIONS_2004.pdf,

#! application files are no longer erased at the end of a run. This was causing difficulties for some users

fortran source was converted to f90

stopped producing _rdj and _rgj

to avoid confusion, phase 22 no longer prints parameter values and confidence intervals or details of residual statistics because they are not optimized values. Rather it only prints sensitivities and correlations for initial parameter values.

#! added feature 2/04

for Phase 22: specifying PERFECT_PROBLEM before the END of the uni file will set cev is one, preventing premature termination as a result of all zero residuals, thus allowing users to evaluate sensitivity and correlation in computer generated problems

#! error in covariance calculation was corrected resulting in slightly larger variance and affecting related calculations such as yielding larger confidence intervals

UCODE3.0_MANUAL_ADDITIONS.PDF

in the c:\wrdapp\UCODE3.02\doc

A weighting scheme that is beneficial when using concentration observations:

Discussion of weighting adjustment for concentration observations: pages 2-4 and 11-13 of UCODE3.0_MANUAL_ADDITIONS.PDF

Input of weighting adjustment for concentrations: pages 8 and 11-13 of UCODE3.0_MANUAL_ADDITIONS.PDF

Additional separate files are printed including:

Files containing sensitivities, including statistics of sensitivities “across rows” or “by observation” rather than just by parameter

filename._sp including for each observation a value in a column for:
observation-identifier plot-symbol sum-of-scaled-sensitivity
average-scaled-sensitivity maximum-scaled-sensitivity
parameter-with-maximum-scaled-sensitivity

filename._s1 including for each observation the raw sensitivity value in a column for each parameter

filename._s2 including for each observation the 1% scaled sensitivity value in a column for each parameter

filename._s3 including for each observation the dimensionless scaled sensitivity value in a column for each parameter

File containing confidence intervals on parameters for use in creating graphics.

filename._cp including for each parameter (and twice if it was log transformed, once in log space and then in native space) a value in a column for:
parameter-identifier lower95%confidence-interval optimal-value
upper95%confidence-interval

User control of the coefficients that control the Marquardt parameter:

Discussion and Input instructions are given on page 6 of UCODE3.0_MANUAL_ADDITIONS.PDF

User option requesting NOT to check for repeat names in the list of observation names, which can be extremely time consuming for long lists (1000's) of observations. Future versions of UCODE will include a more efficient algorithm, but for now once they have been checked, there is no reason to repeat this portion of the evaluation with each execution unless new observations are defined.

Discussion and Input instructions are given on page 7 of UCODE3.0_MANUAL_ADDITIONS.PDF

Association of observation names with space and time coordinates can be accomplished by specifying an xyz file.

Discussion and Input instructions are given on page 9 of UCODE3.0_MANUAL_ADDITIONS.PDF

Printing of long lists to separate files so that the *_ot file will be small even for cases with large numbers of observations

Discussion and Input instructions are given on page 13 and 14 of
UCODE3.0_MANUAL_ADDITIONS.PDF

Including headers in the files to be used for graphing is helpful to remember what items appear
in each column and can be deleted if necessary for analysis

Discussion and Input instructions are given on page 14 of
UCODE3.0_MANUAL_ADDITIONS.PDF

Extracting simulated equivalent directly from a list in the order that they appear in the *.uni file
such that the only items in the *.ext file are names of the files containing the values.

Discussion and Input instructions are given on page 14 of
UCODE3.0_MANUAL_ADDITIONS.PDF

Calculation and printing of summary residuals statistics by group so that one can assess the
relative contributions from different types of observations

Discussion and Input instructions are given on page 14 of
UCODE3.0_MANUAL_ADDITIONS.PDF

A more elaborate restart option

Discussion and Input instructions are given on page 15 and 16 of
UCODE3.0_MANUAL_ADDITIONS.PDF

An option to use multiple computers to run the application codes in parallel. This must be
accompanied by use of the Master program which is provided along with the UCODE3.0
download.

Discussion and Input instructions are given on page 16-18 of
UCODE3.0_MANUAL_ADDITIONS.PDF

Numerous improvements to the format and information in the output have been made that do not
require user intervention. I hope you find these updates beneficial.

I welcome all comments and suggestions epoeter@mines.edu.