

MiraPLOT

COLLABORATORS

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Chapter 1

MiraPLOT

1.1 MiraPLOT 1.3

MiraPLOT 1.3 - MUI version

Introduction	What is MiraPLOT?
Archive contents	All included files
HW/SW requirements	Does it work on my computer?
Available functions	What do I have at my disposal?
Usage	To begin...
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1.2 Introduction

INTRODUCTION

MiraPLOT models parametric 3D surfaces, which can be used in graphics applications supporting the TDDD format (Impulse's IMAGINE among them). Surface definition with real time preview allows the creation of any desired geometric shape in a fast and user-friendly way; ease of use makes MiraPLOT the ideal companion to 3D rendering programs. Emails containing suggestions or bug reports are welcome, even if you simply want to make me know that you use my program. MiraPLOT is freeware, so its distribution is absolutely free (although the source files remain copyright of the author) or, better, it is recommended ;-).

1.3 Archive contents

ARCHIVE CONTENTS:

gdfjgkdlfgsd
gfkgsdfgjhlfdjghsd
gjhfgjflgsjdf
gjlkfglskfdg

1.4 Hardware and software requirements

HW/SW REQUIREMENTS

To work correctly MiraPLOT needs MUI version 3.0 or higher; a 68000 processor is enough to use MiraPLOT although at least a 68030 and an AGA machine are recommended.

MiraPLOT executes floating point calculations and so, if you want a true real time preview (in graphic windows) of the surface you're editing, a floating point unit (FPU) is recommended; a special version of the executable has been compiled for this purpose.

1.5 Available functions

AVAILABLE FUNCTIONS

Here follows what you have at your disposal to define the three X, Y and Z equations.

It's all based on the "expression" concept, so let's first clear up what we mean for "expression".

An expression can be one of the following things:

- 1) a constant
- 2) a number
- 3) the result of an operator applied to one or more expressions

CONSTANTS

e=2.17...
pi=3.14...

ELEMENTARY OPERATORS

In the following list of operators c, u and v are expressions:

u+v sum of u and v
u-v difference of u and v
u*v product of u and v
u/v quotient of u divided by v
u^v u raised to the v-th power
u<v returns 1.0 if u<v, 0.0 otherwise
u>v returns 1.0 if u>v, 0.0 otherwise
u=v returns 1.0 if u=v, 0.0 otherwise
max(u:v) returns the maximum between u and v
min(u:v) returns the minimum between u and v
if(c?a:b) returns a if the condition c is true (different from 0),
otherwise it returns b
(to understand the last operator please read the section about logical operators)

MATHEMATICAL OPERATORS

Please note that trigonometrical operators work on angles expressed in

radians and not in degrees; to convert an angle from degrees to radians you can simply write the value $(X \times \pi)/180$ in place of the angle X.

```
sin(u)  sine of u
cos(u)  cosine of u
tan(u)  tangent of u
asn(u)  arcsine of u
acs(u)  arccosine of u
atn(u)  arctangent of u
snh(u)  hyperbolic sine of u
csh(u)  hyperbolic cosine of u
tnh(u)  hyperbolic tangent of u
exp(u)  exponential of u ( $e^u$ )
log(u)  logarithm of u
sqr(u)  square root of u
abs(u)  absolute value of u
int(u)  integer part of u
```

LOGICAL OPERATORS

Logical operators operate in a domain constituted by variables which can only assume the TRUE or FALSE values.

MiraPLOT implements these logical values associating the FALSE value to 0.0 and the TRUE value to every other number (different from 0.0); this kind of association is called "positive logic".

```
not(u)  "not u"
not(u)  is TRUE if u is FALSE, otherwise it is FALSE
```

examples:

```
not(0.0)=1.0          not(1.0)=0.0
not(47521.7318)=0.0   not(0.000001)=0.0
not(not(-3640))=1.0   not(not(not(0.0)))=1.0
not(1.0-cos(0.0))=1.0 not(sin(0.1))=0.0
not(int(0.999))=1.0   not(233>300)=1.0
```

```
or(u:v)  "u or v"
or(u:v)  is FALSE if both u and v are FALSE, otherwise it is TRUE
```

examples:

```
or(not(not(0.0)):0.0)=0.0
or(not(u):u)=1.0 for any u
or(0.0:u)=not(not(u)) for any u
or(u:1.0)=1.0 for any u
or(sin(0.0):1.0-1.0)=0.0
```

```
and(u:v)  "u and v"
and(u:v)  is TRUE if both u and v are TRUE, otherwise it is FALSE
```

examples:

```
and(not(0.0):1974)=1.0
and(31:1)=1.0
and(0.0:u)=0.0 for any u
and(u:not(u))=0.0 for any u
and(not(3):not(0.0))=0.0
```

$\text{and}(\text{or}(u:\text{not}(u)):\text{or}(v:\text{not}(v)))=1.0$ for any u and v pair

1.6 Usage

USAGE

MiraPLOT's graphic interface is made up of two windows, the main one is used to manage surfaces while the other one is used to type in and edit surface parameters.

Optionally, other windows can be opened to show a 3D perspective view of the surfaces.

- MAIN WINDOW (surface management)

MiraPLOT lets the user operate on any number of surfaces (according to available memory). Available operations are:

New surface

This button inserts a new surface in the list, giving it a default name; such a surface is a plane ($X=u$; $Y=v$; $Z=0$) and it is automatically selected as soon as it is created. The user can then edit the surface using the proper window.

The default name will be changed as soon as the surface is saved on disk (in proprietary format).

Load surface

This function loads a surface from disk; the valid format for the file is the proprietary one, according to which the descriptor file begins with "MIRAEQxx" (file suffix: ".SRF"), where 'xx' indicates the format version number.

This function (like the "New surface" one) automatically selects the newly loaded surface.

Save surface

The surface is saved on disk; saved informations are essentially the three X , Y and Z equations, the two variables' ranges (u and v) and the ranges' steps (format V1.2).

After this operation, the surface in the list is renamed with the name which has been used to save it.

Save TDDD

Using this function you can export the currently selected surface in the TDDD format, making it loadable by IMAGINE (Impulse).

The TDDD format, in opposition to MiraPLOT's proprietary one, doesn't include the informations needed to obtain the mathematical surface, but it contains a numerical description of the same surface, so files in the TDDD format cannot be read using the surface loading function.

Delete surface

This function removes the currently selected surface from the list in memory and also closes all 3D representations of the same surface.

Clear

Does the same as the Delete function, but it applies to all surfaces, not just the selected one.

- EQUATION EDIT WINDOW

Using this window you can edit the surface parameters; the gadgets are active only if an element is selected in the main window's list.

A point in space that moves according to one parameter:

$$(X(u); Y(u); Z(u))$$

describes a curve in the 3D space, while if the variation happens according to two parameters:

$$(X(u, v); Y(u, v); Z(u, v))$$

we can move on the curve in two different directions:

- 1) fixed u movement
- 2) fixed v movement

and so we have described a surface.

The first 3 gadgets are used to define how X, Y and Z change according to u and v; as in all other window gadgets, you can use here mathematical expressions made up of operators included in the list of available functions.

Besides the 3 equations you also have to specify the ranges of u and v; 4 gadgets are available for this purpose, which also allow the representation of Min U, Max U, Min V, Max V through constant functions. Moreover, from this window you can add other 3D view windows using the proper button.

- 3D VIEW WINDOWS

To speed up as much as possible the definition of the mathematical surface, MiraPLOT offers the possibility to view its shape in real time, also using multiple views.

When depressing the "New 3D view" button in the equation edit window, the new view of the currently selected surface is opened; you can open a maximum of 9 graphic windows which can refer to any one of the surfaces in the list (so they can also refer to the same surface).

You can use the cursor keys to change the view or operate the slider on the side of the window to change the zoom factor.

1.7 Copyright

COPYRIGHT

Please read this section carefully.

- 1) MiraPLOT 1.3 - Copyright (C) 1995-2001 Massimo Perfini
All rights reserved.
 - 2) MiraPLOT is freeware; this means that anyone can use it without having to pay a license or similar to anyone.
 - 3) You are allowed to copy the entire archive as long as its contents
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1.8 Author

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