Use of Lparser

Just drag an inputfile over the Lparser program icon, or over a shortcut to the Lparser program. The Lparser will start with the dropped inputfile and create a VRML output.wrl file in the same directory where the inputfile came from. The Lparser will pop open a window, just hit a key to close it after parsing.

If no file is passed the Lparser will look for the input.ls file in the directory where the program is located. You can also pass the filename using the standard commandline, for instance in a batch file.

Viewing VRML files

After parsing just double click on the output.wrl file. Internet explorer will startup with the VRML viewer. You can leave the explorer open and just have to hit reload after you've edited the inputfile and re-parsed. It will generate VRML 2.0 Shape objects.

Syntax and movement

For those who are already familiar with l-systems, here are the commands and their functions for this lparser's 'dialect'. All commands are 1 char only and simpler then for most lparsers. This is to keep them from getting 'broken' by the mutation process and speeds up the parsing.

There is also the posibilty to add an argument to a command. Instead off doing +++ one can do +(30) if the basic angle was 10 degrees. The argument can be a real value.

The tropism command will allow you to let gravity pull branches downward by adding a 't' element togeter with and 'F'. See the file 'tree*.ls' for examples. When you are not sure about the current 'down' direction do a '$' command first. This will roll the turtle horizontal and make sure the current up vector is oriented in the positive z-axis direction.

The turtle will start at the origin with the Z-axis as forward direction and Y-axis as left direction. See the file 'axis.ls' for an detailed example. Here you can experiment with the basic orientations and see how the 3d turtle is using a 'right-handed' coordinate system. Use your right hand with your thumb as up, forefinger as forward and another finger as left direction.

Values can have some randomness automatically added to them. Using ~(xx) will now add a random direction component to the current orientation with maximum of xx in all three directions. This way you can mark at which locations in your l-system 'jitter' needs to be introduced. Using this option no two 'instances' of the same l-system will look the same. See fern.ls for an example.

Keywords

If a keyword is not supplied the default value is used. There is no specific order for the keywords.

Signifies a comment line.

recursion x   Sets the recursion level to x. (default = 1)

angle x   Sets the basic angle for movement to x degrees. (default = 45 degrees)

mutation x   Mutates the l-systems rules x times before parsing. (default = 0)

thickness x   Set the percentage of the length to use as the starting thickness for the elements. (default = 100%)

min_thickness x Sets the lower limit on how small elements may get as a percentage of their length. This is to stop them from disappearing when they get to thin. (default = 0%)

switch_yz 0/1   This switches on the swapping of the y and z coordinates on output. Some VRML viewers don't use the Z-axis as up, as the Lparser does, but use the Y-axis instead. (default = 0)

shape x   Sets the output shape to choice x. (default = 0):
           0 = block output
           1 = attached cylinder output with smoothing enabled.

no_wait 0/1   When set to 1 the Lparser will not ask for a key to be pressed after completion. (default = 0)

poly_limit x   Limit the final VRML shape to x polygons. This is to keep mutating forms from becoming too large to handle in the viewer. (default = no limit)

color i r g b   Set2 color index to the RGB value. RGB valutes between 0-255. The first values are default set. See the description of the the "c" command. You can set a maximum of 100 colors (see rainbow.ls for an example).

axiom s   This sets the string s to be used as the first production string for the l-system.

rule s   This adds the string s to the l-system rules.

Rule format

Rules are formatted this way: rule <char> <=> <string>. During the parsing the <char> is to be replaced with the <string>.

Turtle Orientation commands

+	turn left around up vector
+(x)	turn x left around up vector
-	turn right around up vector
-(x)	turn x right around up vector
&	pitch down around left vector
&(x)	pitch x down around left vector
^	pitch up around left vector
^(x)	pitch x up around left vector
<	roll left (counter clockwise) around forward vector
<(x)	roll x left around forward vector
>	roll right (clockwise) around forward vector
>(x)	roll x right around forward vector

Special Orientation commands

|	turn 180 deg around up vector
%	roll 180 deg around forward vector
$	roll until horizontal
~	turn/pitch/roll in a random direction
~(x)	turn/pitch/roll in a random direction with a maximum of x degrees
t	correction for gravity with 0.2
t(x)	correction for gravity with x

Movement commands

Starting full length distance is 1 unit.

F	move forward and draw full length	record vertex
F(x)	move x forward and draw	record vertex
Z	move forward and draw half length	record vertex
Z(x)	move x forward and draw	record vertex
f	move forward with full length	record vertex
f(x)	move x forward	record vertex
z	move forward with half length	record vertex
z(x)	move x forward	record vertex
g	move forward with full length	don't record vertex
g(x)	move x forward	don't record vertex
.	don't move	record vertex

Structure commands

[	push current state
]	pop current state
{	start polygon shape
}	end polygon shape

Inc/Dec commands

"	increment length with 1.1
'	decrement length with 0.9
"(x)	multiply length with x also '(x)
;	increment angle with 1.1
:	decrement angle with 0.9
:(x)	multiply angle with x also ;(x)
?	increment thickness with 1.4
!	decrement thickness with 0.7
?(x)	multiply thickness with x also !(x)

Color commands

c	increment color index (default color index = 2)
c(x)	set color index to x . (see colors.ls for an example)

    1 = Grey
    2 = Red (default starting color)
    3 = Yellow
    4 = Green
    5 = Turquoise
    6 = Blue
    7 = Purple
    8 = Dark Green (used for leaves)
    9 = Dark Turquoise
    10 = Dark Blue
    11 = Dark Purple
    12 = Dark Red (used for tree bark)
    13 = Dark Grey
    14 = Medium Grey
    15 = White