

CS151 Parameterized Stochastic L-Systems

Notes

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The goal of these notes is to help you understand the stochastic L-systems that are supplied as part of Lab 10.

Symbols in drawString

To make `sysTree2.txt` and `sysTree3.txt` work, we need the following symbols supported by `Interpreter.drawString`.

- `F` and `f` must both mean “forward by the (modified) distance”
- `L` must draw a leaf whose size can be scaled by a modifier.
- `!` must handle the width. If there is no modifier, then it should decrease the width by 1 (being careful not to reduce it below 1). If there is a modifier, then it should set the width to the value of the modifier.

To draw these trees, a good value for distance is 1.

Understanding sysTree3.txt

Here is the first example L-system:

```
base (50)F
rule F (50) f [!(30) -F<g(5)L>] [!(40)+F<g(5)L>]!F
rule (x) f (1.5*x) f (1.25*x) f (1.7*x) f
rule (x)- (x*1.2)- (x*0.8)- (x*1.05)- (x*1.0)- (x*0.95)- (x*0.87)- (x*1.12)-
rule (x)+ (x*1.2)+ (x*0.8)+ (x*1.05)+ (x*1.0)+ (x*0.95)+ (x*0.87)+ (x*1.12)+
```

And the observations we made about it:

- Turns, forwards, and leaf-sizes are modified by modifiers.
- The structure of the tree is deterministic (we always move forward and make two branches (or subtrees) to the left and right, and the grown the branch (or subtree) up.
- Distances and angles are stochastic
- The scales in front of F and f should be of comparable sizes.

Understanding sysTree2.txt

Here is the second example L-system (where you are supposed to assume that the rule is all on one line):

```
base (5)!(100)F
rule (x)F (x)F [!+(2*x/3)F<g(5)L>] [!-(2*x/3)F<g(5)L>]
      (x)F [!-(2*x/3)F<g(5)L>] [!(1*x/2)F<g(5)L>]
      (x)F [!+(2*x/3)F<g(5)L>] [!(1*x/2)F<g(5)L>]
```

And the observations we made about it:

- Turns, forwards, leaf-sizes, and widths are modified by modifiers.
- The structure of the tree is stochastic (we branch forward and left, or forward and right, or left and right).
- Distances are decreased as we branch.