Evolutionary Art

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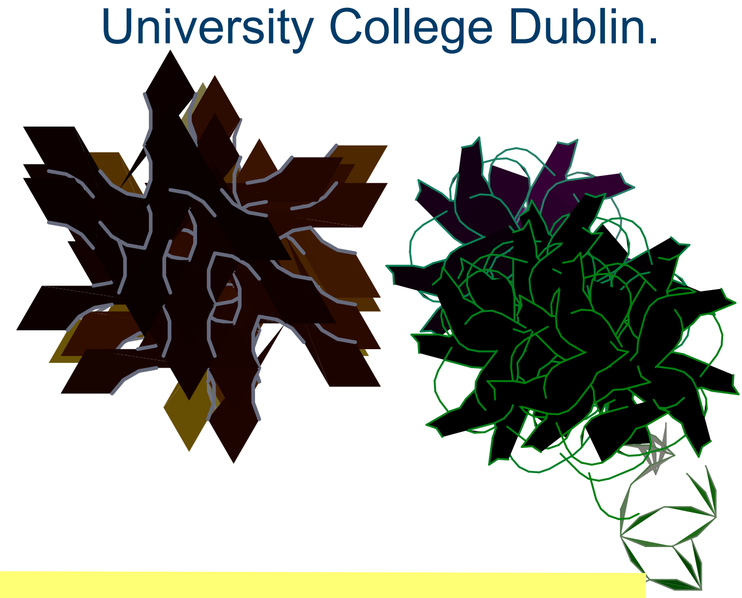
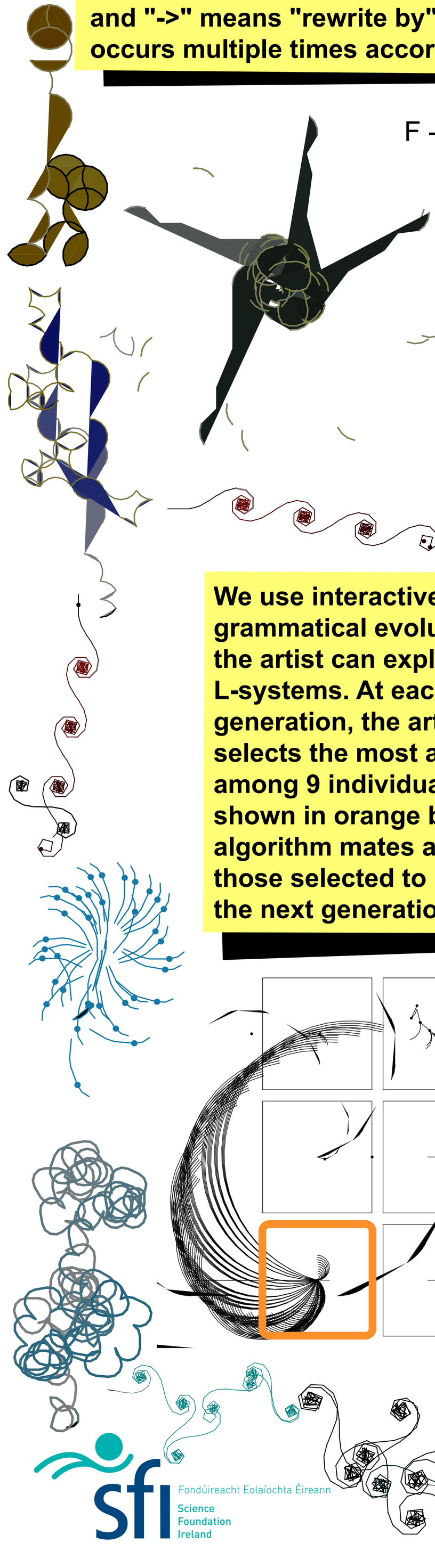
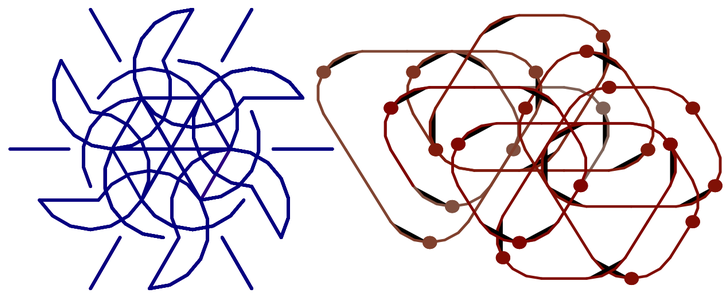
A Lindenmeyer system is a string-rewriting method used in modelling plant growth. In the example to the right, "F" means "draw a straight line", "+/-" mean "turn clockwise/anti-clockwise" and "->" means "rewrite by". The rewriting occurs multiple times according to a parameter.

F -> F - F + + F - F





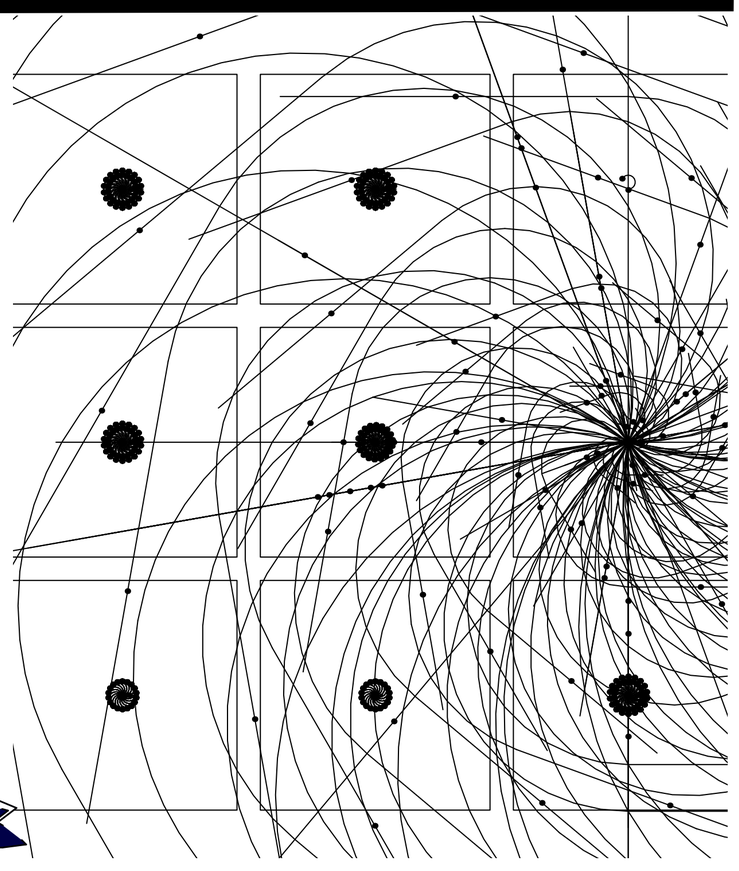
We have added some of our own modifications -- like colours, arcs, and dots.



We can use a grammar to generate L-systems. Here, "f" means "move "forward", "D" means "draw a dot", "n/m" change colour parameters, and "a" means "draw an arc":
<L> ::= <angle><recursion><rules>
<rules> ::= <rule> | <rule><rules>
<rule> ::= <char> -> <chars>
<chars> ::= <char> | <char><chars>
<char> ::= f | F | + | - | D | n | m | a

We use interactive grammatical evolution so the artist can explore many L-systems. At each generation, the artist selects the most appealing among 9 individuals as shown in orange below. The algorithm mates and mutates those selected to produce the next generation.

Sometimes the population as a whole is more interesting than the sum of the parts.



Download the code and try it out: http://code.google.com/p/ponyge.

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