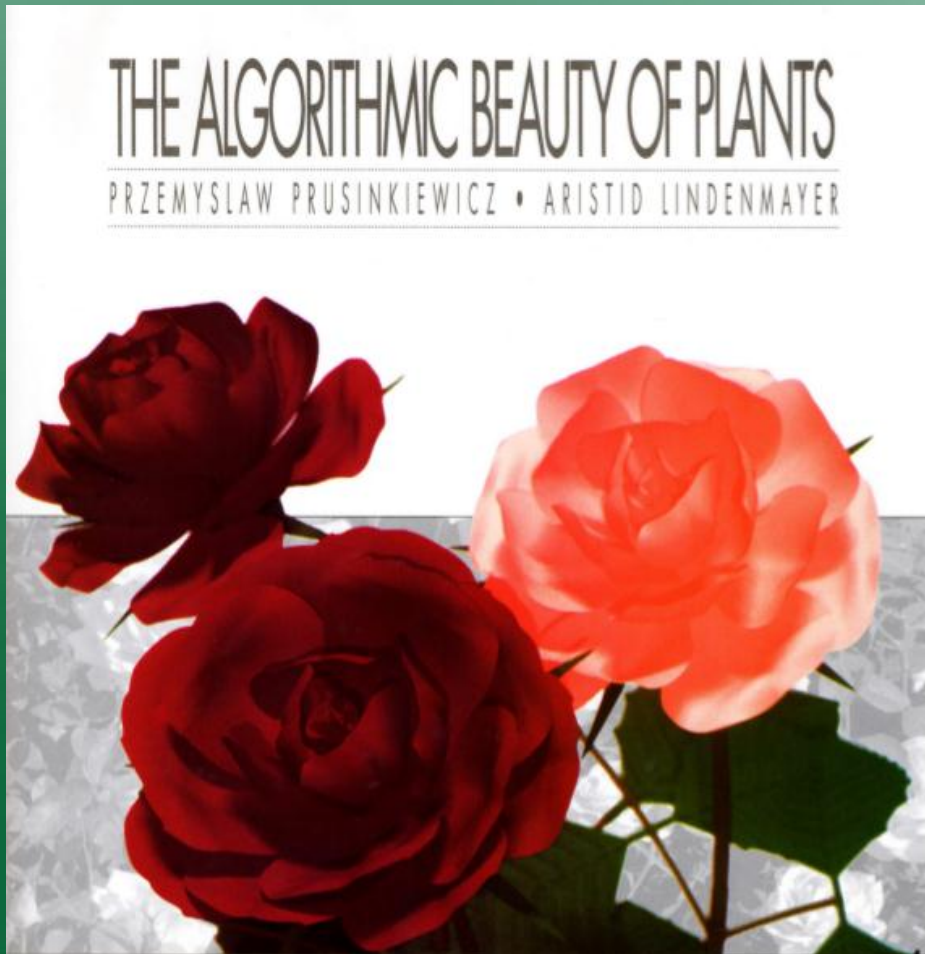


L Systems: The Algorithmic Beauty of Plants

Charlie Soeder – TopologicOceans.wordpress.com

'Save the Corals, Maaaan.'

L Systems



- Due primarily to Lindenmayer and Prusinkiewicz
- Concise descriptions of plant form
- CGI applications
- Other applications?

Genotype

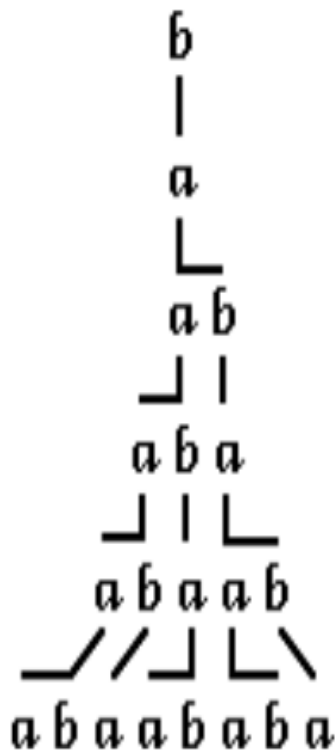


Figure 1.3: Example of a derivation in a DOL-system

The 'topological' end of an L System involves:

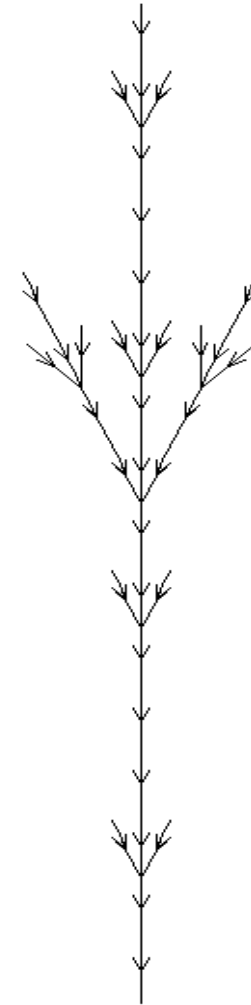
- An alphabet of symbols (eg, [a,b])
- A set of production rules (eg, ['b->a', 'a->ab'])
- A starting axiom (eg, b)
- Iteration

Phenotype

The 'geometric' end of an L System involves:

- Interpretation of symbols and strings
- Turtle-style graphics, typically
- Branching symbols – think push and pop

$F \rightarrow FF[+F][-F]FF$



So what?

Easy CGI

Run through the space of
genotypes and
phenotypes to generate
imagery



Figure 3.21: The garden of L

Applications to Botany?



- As a quantitative descriptor of plant geometry
- Phylogenetic trees
- Connecting molecular biology to plant morphology
- Fractal geometry
- Modelling leaf venation

Further Reading

Algorithmic Botany: <http://algorithmicbotany.org/>

THANK YOU WORKERS!!!