Lindenmayer Systems Fractals Evolved by Pfeiffer 10 September–9 November 2003

Research Note RN/04/13

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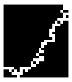
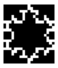
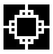
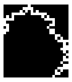
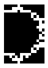
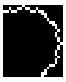
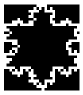
Abstract

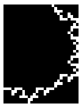
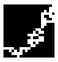
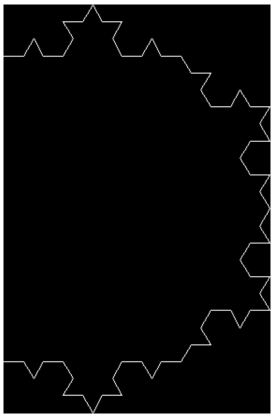
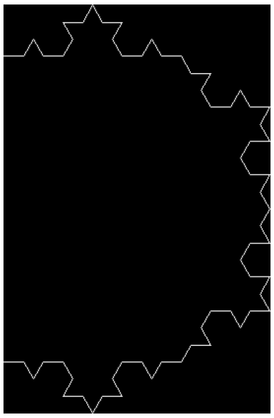
Pfeiffer `http://www.cs.ucl.ac.uk/staff/W.Langdon/pfeiffer.html` is an interactive JavaScript based system for evolving fractal patterns similar to Koch's snow flake. All patterns evolved during a two month trial period during the Autumn of 2003 are given.

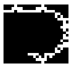
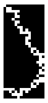
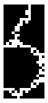
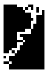
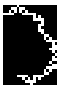
This research note should be viewed as an appendix to:

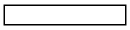
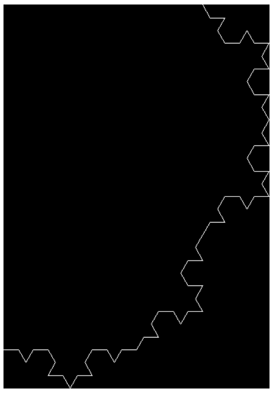
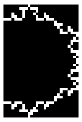
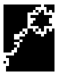
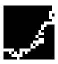
- W. B. Langdon. Global distributed evolution of L-systems fractals. In Maarten Keijzer, Una-May O'Reilly, Simon M. Lucas, Ernesto Costa, and Terence Soule, editors, *Genetic Programming, Proceedings of EuroGP'2004*, volume 3003 of *LNCS*, pages 349–358, Coimbra, Portugal, 5-7 April 2004. Springer-Verlag.
- W. B. Langdon. Global distributed evolution of Lindenmayer systems fractals. 2004. To be submitted.

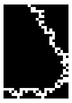
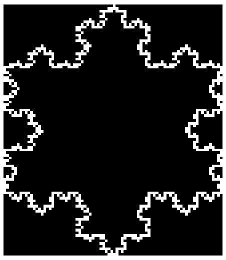
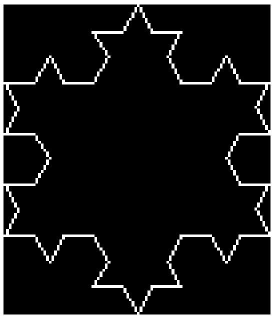
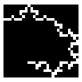
Fractal Patterns Created

Count	Image			GIF	Example Grammar						
		size	bytes	num	Size	Deg	It	Side	Steps	Start	Rules
170		15×14	73	4	61				48	F++F+F	('F',','-F+F-F-F+F
1		7×12	59	1	60	-72			32	+F+F+4+5	('F','F-F++F-F')
4		24×27	98	3	46				64	F+,s5tF3F5F+rc3c	
19		10×3	49	1	49	6		4	48		
4		19×22	100	4	42			10	48		('FF-)s
15		17×17	84	7	110	90		10	64	F+F+F+F	(%27F%27,%27-F+F-F-F+F+FF-F+F+FF+F-F-FF+FF-FF+F+F-FF-F-F+FF-F-F+F+F-F+%27)
1		24×27	106	1	66				80	+F+FF+F+F	('F'''F-F++F-F-F'
59		47×11	77	15	48	6			48		
11		45×16	90	1	84	9			48		
11		8×7	54	2	56	-72			48		('F','F-F++F-F"
3		10×4	52	2	49				16	F+	('F','F-F++F-F')
19		15×22	84	10	64				64	F+F+F+F	('F',','-F+F-F–FF+F
2		5×13	57	1	50	90			64	'+F+4+FFF	
1		5×5	48	1	40			2	48		
2		22×27	92	1	48	690			48		
38		28×32	140	6	50		3		192		('F','F-F++F-F')
3		2×1	43	2	39	5	0	4	3		
31		14×14	76	2	56	-72			80	+F+F+F+F+F	('F','F-F++F-F"
10		5×5	49	1	45	90			48		

Count	Image	size	bytes	GIF num	Size	Deg	It	Side	Steps	Example Grammar Start	Rules
1		33×27	120	1	53				112	F++F+tF3F5F +rc34+c++'l44FrFs	
2		28×37	122	2	47			10	48	F+F+F	('F',e-F-F-
1		10×7	57	1	47				32	rF+'++F	
1		15×14	76	1	49				64	F++'+F+4+F+F	
4		97×1	49	3	44	0		10	48		F'e,-
6		24×14	83	2	48				64	F++F+Ft5F+r	
1		93×22	122	1	48	6		10	48		('F'e-
1		19×20	88	1	50				80	F+F3t5F+rc34+- ++'l44FrrF15	
16	.	2×2	43	1	50		0		3		
1		285×438	1499	1	47			105	64	F+F+F+F	
15		11×1	44	3	47	0		4	48		
10	.	3×2	44	1	53	607			48		
4		271×417	1412	2	48			100	64	F+F+F+F	('F','-+F++FF-

Count		Image		GIF	Example Grammar						
		size	bytes	num	Size	Deg	It	Side	Steps	Start	Rules
1		28×27	115	1	49				96	F++F+F+FFF	
3		24×22	94	2	48				80	F+F+F+FF	
1		19×4	58	1	51				32	Fi,s5tF3	('F','F-F++F-F')
11		20×19	91	9	67				80	+F+F+F+F+F	('F','F-F++F-F-F'
3		15×35	101	1	47				80	rF+'F+4tFFFt	
2		15×35	102	1	67				96	F+F+F+F+rc34 +c++'l44FrF'15	
1		10×17	70	1	50				48	rF+'+++4tFF+r	
877		49×1	47	29	50	0			48		('F'4'+-F++F-F')
83		1×1	43	14	42	5		0	48		
3279		10×12	64	27	67				48		('F','-F'F+F-F–F+F
1		3×1	43	1	53	0	0	4	3		
2		28×17	95	1	54				80	s5tF3F5F +rc34+c++'l44FrF'15	
3		13×13	68	2	101	90		10	32	F+F	('F','-F+F-F-F+F+FF- F+F+FF+F-F-FF+FF- FF+F+F-FF-F-F+FF-F- F+F+F-F+')
5		15×24	86	1	48				64	rF+'+++4tFFF	
3		4×6	49	1	46			1	64	F+F+F+F	
1		2×2	43	1	48	-72		4	48		
4		13×5	56	1	48	90			80	FF+4+FFF	
2		20×30	103	1	53				80	F+F+FF+F	

Count		Image size	Image bytes	GIF num	Size	Deg	It	Side	Steps	Start	Rules
8		15×9	64	1	50	90			80	F+F+tFFF	
249		10×3	49	31	32	5		4	48		
1		15×12	67	1	50				32	F+F	
1		24×14	88	1	56				80	FF+'F+4 +F+F	
1		19×19	90	1	52				80	F++F+F +4F+F	('F','F-F++F- F')
2		65×1	48	1	55	0			64	rF+'++ +4tFFF	
111		39×1	46	5	54	0		4	48		
1		361×521	1653	1	48			100	64	F+FF+F	('F','-+F++FF-
15		3×2	44	1	60		0		3	F++F+F	
2		38×9	70	1	52	6		4	48		
110		28×42	140	23	65			10	64	F+F+F+F	('F','-F++F -F-F+F+F
2		8×9	58	1	52	60		4	48		
2		19×25	96	1	49				80	F++F++ 4tFFF	
3		19×20	81	1	50				48	F+,s5tF 3t5F+r	

Count		Image		GIF				Example Grammar			
		size	bytes	num	Size	Deg	It	Side	Steps	Start	Rules
3		24×35	118	2	47				96	FF+'F+ 4tFFF2	
153		3×4	46	8	51	60		44	48		
9		10×20	74	4	66				48	F++FF+ 4+itt	
21		24×17	98	2	51				96	F++F++F 3t5F+rc34+c ++'l44FrF'15	
154		48×9	74	27	49	5			48		
2		38×8	69	1	51	5		4	48		
24		82×94	491	1	46		4		768		
2		37×17	105	1	66				96	FtF3F5F+r c34+c++' l44FrF'15	
2		100×116	497	1	60			55	48		
8		28×27	113	4	58			10	48	F++F+F	('F','-F+F-F+F
9		4×2	45	2	24	5	0		3		
2		15×17	81	2	51				64	F++F++F 3t5F+rcsc	('F','F-F++F- F')
3		2×2	44	1	49	607	0		3		
4		10×12	65	1	46				48	F++F+++F	
5653			373643	307	≈339115						