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# Supplemental Material for Parameter Identification for Pattern-Generating Reaction-Diffusion Systems – Towards Generative Texture Descriptors

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## A Parameters from the experiments on synthetic patterns

Table 1: Parameters from the experiments in Figure 4. In these experiments, diffusion parameters were fixed, and only reaction parameters were estimated. Moreover, the same initialization (based on the least-squares cost function  $J_I$ ) was used for all parameter estimations.

	Param.	Ground truth	Init., $J_I$	Estim., $J_I$	Estim., $J_{II}$	Estim., $J_{III}$	Estim., $J_{IV}$
Fig. 4(a–e)	$D_1$	1200.00	1200.00	1200.00	1200.00	1200.00	1200.00
	$D_2$	200.00	200.00	200.00	200.00	200.00	200.00
	$F$	200.00	172.92	238.03	207.66	234.12	411.26
	$K$	310.00	187.86	335.36	296.63	278.05	291.68
	$R$	6000.00	4575.91	5506.53	5688.02	4915.39	4943.38
Fig. 4(f–j)	$D_1$	1200.00	1200.00	1200.00	1200.00	1200.00	1200.00
	$D_2$	200.00	200.00	200.00	200.00	200.00	200.00
	$F$	200.00	172.92	973.77	217.95	41.04	269.36
	$K$	310.00	187.86	936.94	236.97	269.85	295.09
	$R$	6000.00	4575.91	19614.86	4300.74	75454.20	5148.93
Fig. 4(a, k–n)	$D_1$	1200.00	1200.00	1200.00	1200.00	1200.00	1200.00
	$D_2$	200.00	200.00	200.00	200.00	200.00	200.00
	$F$	200.00	552.71	375.44	394.29	407.23	268.18
	$K$	310.00	328.20	243.75	221.91	558.88	330.43
	$R$	6000.00	7098.73	5039.30	4476.81	10269.48	6019.51
Fig. 4(a, o–r)	$D_1$	1200.00	2500.00	2500.00	2500.00	2500.00	2500.00
	$D_2$	200.00	300.00	300.00	300.00	300.00	300.00
	$F$	200.00	172.80	368.83	306.01	325.70	307.14
	$K$	310.00	416.27	568.02	539.23	494.58	453.35
	$R$	6000.00	6822.14	10447.09	10079.94	10541.63	10055.44

## B Parameters from the experiments on real-world patterns

Table 2: Parameters from the experiments in Figure 5. In these experiments, diffusion and reaction parameters were estimated. Initialization was done for each cost function separately. Since the pre-selection of pattern-capable parameter sets by sampling of the parameter space was the same for all cost functions, there are coincidences where the same set was identified as optimal initialization for two different cost functions.

Param.	$J_I$		$J_{II}$		$J_{III}$		$J_{IV}$	
	Init.	Estim.	Init.	Estim.	Init.	Estim.	Init.	Estim.
Fig. 5 (a–e) $D_1$	624.67	−0.64	104.34	36.15	889.37	1007.56	2221.22	2844.58
$D_2$	35.33	1.48	17.23	37.34	42.33	51.77	436.19	965.19
$F$	255.79	49.34	679.14	706.41	722.20	835.31	941.97	884.25
$K$	784.58	58.60	372.71	405.08	218.18	313.78	468.58	436.57
$R$	8463.52	1139.97	8146.42	8179.78	9168.74	10939.43	7969.66	8009.98
Fig. 5 (f–j) $D_1$	898.24	0.01	358.19	34.49	358.19	156.05	1683.49	2772.56
$D_2$	3.07	21.90	35.55	34.99	35.55	58.54	354.36	484.04
$F$	216.02	0.00	689.77	715.37	689.77	1088.82	407.78	456.21
$K$	490.31	−70.18	387.45	613.22	387.45	189.30	422.44	420.49
$R$	3013.07	−142.02	7865.04	13063.76	7865.04	9350.21	7594.07	7171.39
Fig. 5 (k–o) $D_1$	374.21	0.00	374.21	−0.03	1006.38	1590.28	2499.19	3224.17
$D_2$	63.14	0.00	63.14	68.99	57.12	68.58	188.51	176.23
$F$	153.72	0.00	153.72	0.03	853.33	974.78	603.25	478.25
$K$	148.26	0.01	148.26	2006.32	510.78	125.56	203.67	204.09
$R$	8793.41	0.36	8793.41	50276.19	5908.23	5329.46	2360.07	3044.70