A Recursive Subdivision Technique for Sampling Multi-class Scatterplots

- Supplementary Material -

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This supplemental material file provides additional experimental results for our submitted paper titled "A Recursive Subdivision Technique for Sampling Multi-class Scatterplots." In the quantitative evaluation of our paper, 10 synthetic datasets were manually created with random Gaussian classes and 27 real datasets were collected from Kaggle [3] and UCI data repository [4]. We provide the detailed results here. The results include the screen shots generated by our method and three previously mentioned sampling methods [1, 2] and their corresponding scores. In addition, to show our method can be easily extended to multi-dimensional data, we present a full scatterplot matrix with our sampled result here. The covertype dataset from UCI repository [4] is used here.

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Manuscript received xx xxx. 201x; accepted xx xxx. 201x. Date of Publication xx xxx. 201x; date of current version xx xxx. 201x. For information on obtaining reprints of this article, please send e-mail to: reprints@ieee.org. Digital Object Identifier: xx.xxxx/TVCG.201x.xxxxxx















	Original	Our		Random	
Nomao point_num: 34410 class_num: 3					
		PDDr: 0.78	PCDr: 0.66	PDDr: 0.77	PCDr: 0.71
		ESCr: 0.80	ESRr: 0.03	ESCr: 0.69	ESRr: 0.08
	Original + Transparent	Non-uniform		Blue noise	
		PDDr: 0.55	PCDr: 0.77	PDDr: 0.64	PCDr: 0.65
		ESCr: 1.28	ESRr: 0.00	ESCr: 1.37	ESRr: 0.05
	Original	Our		Rano	dom
Person Activity					
		PDDr: 0.93	PCDr: 0.78	PDDr: 0.96	PCDr: 0.79
noint num: 08568		ESCr: 0.36	ESRr: 0.16	ESCr: 0.87	ESRr: 0.28
class_num: 4	Original + Transparent	Non-uniform		Blue noise	
class_num: 4					
class_num: 4		PDDr: 0.89	PCDr: 0.70	PDDr: 0.93	PCDr: 0.75
class_num: 4		PDDr: 0.89 ESCr: 1.08	PCDr: 0.70 ESRr: 0.01	PDDr: 0.93 ESCr: 1.26	PCDr: 0.75 ESRr: 0.25
class_num: 4	Original	PDDr: 0.89 ESCr: 1.08	PCDr: 0.70 ESRr: 0.01 ur	PDDr: 0.93 ESCr: 1.26	PCDr: 0.75 ESRr: 0.25 dom
class_num: 4	Original	PDDr: 0.89 ESCr: 1.08 O	PCDr: 0.70 ESRr: 0.01 ur	PDDr: 0.93 ESCr: 1.26 Rand	PCDr: 0.75 ESRr: 0.25 dom
class_num: 4	Original	PDDr: 0.89 ESCr: 1.08 O	PCDr: 0.70 ESRr: 0.01 ur PCDr: 0.93	PDDr: 0.93 ESCr: 1.26 Rand	PCDr: 0.75 ESRr: 0.25 dom
class_num: 4	Original	PDDr: 0.89 ESCr: 1.08 O PDDr: 0.90 ESCr: 0.13	PCDr: 0.70 ESRr: 0.01 ur PCDr: 0.93 ESRr: 0.08	PDDr: 0.93 ESCr: 1.26 Rand PDDr: 0.87 ESCr: 0.36	PCDr: 0.75 ESRr: 0.25 dom
satimage point_num: 4435	Original Original	PDDr: 0.89 ESCr: 1.08 O PDDr: 0.90 ESCr: 0.13 Non-u	PCDr: 0.70 ESRr: 0.01 ur PCDr: 0.93 ESRr: 0.08 niform	PDDr: 0.93 ESCr: 1.26 Rand PDDr: 0.87 ESCr: 0.36 Blue	PCDr: 0.75 ESRr: 0.25 dom PCDr: 0.89 ESRr: 0.13 noise
class_num: 4 satimage point_num: 4435 class_num: 6	Original Original Original + Transparent	PDDr: 0.89 ESCr: 1.08 O PDDr: 0.90 ESCr: 0.13 Non-u	PCDr: 0.70 ESRr: 0.01 ur PCDr: 0.93 ESRr: 0.08 niform	PDDr: 0.93 ESCr: 1.26 Rand PDDr: 0.87 ESCr: 0.36 Blue	PCDr: 0.75 ESRr: 0.25 dom PCDr: 0.89 ESRr: 0.13 noise
class_num: 4 satimage point_num: 4435 class_num: 6	Original Original	PDDr: 0.89 ESCr: 1.08 O PDDr: 0.90 ESCr: 0.13 Non-u	PCDr: 0.70 ESRr: 0.01 ur PCDr: 0.93 ESRr: 0.08 niform	PDDr: 0.93 ESCr: 1.26 Rand PDDr: 0.87 ESCr: 0.36 Blue PDDr: 0.73	PCDr: 0.75 ESRr: 0.25 dom PCDr: 0.89 ESRr: 0.13 noise

sensorless point_num: 42552 class_num: 8	Original	0	ur	Random	
		PDDr: 0.94	PCDr: 0.99	PDDr: 0.94	PCDr: 0.92
		ESCr: 0.08	ESRr: 0.04	ESCr: 0.30	ESRr: 0.07
	Original + Transparent	Non-uniform		Blue noise	
		PDDr: 0.87	PCDr: 0.92	PDDr: 0.74	PCDr: 0.85
		ESCr: 0.29	ESRr: 0.01	ESCr: 0.52	ESRr: 0.07
	Original	Our		Random	
		2.2.5. 1.2. 1.1.5. 1.1.5. 1.2.			
synthesis1		PDDr: 0.95	PCDr: 0.98	PDDr: 0.93	PCDr: 0.98
synthesis i		ESCr: 0.02	ESRr: 0.05	ESCr: 0.24	ESRr: 0.11
\mathbf{DOINT} \mathbf{DOINT} \mathbf{DOOOO}					
class num: 2	Original + Transparent	Non-u	niform	Blue	noise
class_num: 2	Original + Transparent	Non-u	niform	Blue	noise
class_num: 2	Original + Transparent	Non-u	niform	Blue	noise
class_num: 2	Original + Transparent	Non-u PDDr: 0.89	niform PCDr: 1.00	Blue PDDr: 0.89	noise PCDr: 0.94
class_num: 2	Original + Transparent	Non-u PDDr: 0.89 ESCr: 0.22	niform PCDr: 1.00 ESRr: 0.00	Blue PDDr: 0.89 ESCr: 0.34	noise PCDr: 0.94 ESRr: 0.14
class_num: 2	Original + Transparent Original Original	Non-u PDDr: 0.89 ESCr: 0.22 O	niform PCDr: 1.00 ESRr: 0.00 ur	Blue PDDr: 0.89 ESCr: 0.34 Ranc	PCDr: 0.94 ESRr: 0.14
class_num: 2	Original + Transparent Original Original	Non-u PDDr: 0.89 ESCr: 0.22 O	niform PCDr: 1.00 ESRr: 0.00 ur	Blue of Blue o	noise PCDr: 0.94 ESRr: 0.14 dom
class_num: 2	Original + Transparent	Non-u PDDr: 0.89 ESCr: 0.22 O	niform PCDr: 1.00 ESRr: 0.00 ur	Blue of Alline o	noise PCDr: 0.94 ESRr: 0.14 dom
class_num: 2	Original + Transparent	Non-u	niform PCDr: 1.00 ESRr: 0.00 ur PCDr: 0.99	Blue of the second seco	PCDr: 0.94 ESRr: 0.14 dom
synthesis10 point_num: 10000 class_num: 2	Original + Transparent	Non-u PDDr: 0.89 ESCr: 0.22 O PDDr: 0.95 ESCr: 0.01	niform PCDr: 1.00 ESRr: 0.00 ur PCDr: 0.99 ESRr: 0.10	Blue d Blue d Blue d PDDr: 0.89 ESCr: 0.34 Rand Rand PDDr: 0.97 ESCr: 0.15	PCDr: 0.94 ESRr: 0.14 dom PCDr: 0.94 ESR: 0.18
synthesis10 point_num: 51416 class_num: 5	Original + Transparent Original Original Original Original Original Original Original	Non-u PDDr: 0.89 ESCr: 0.22 O PDDr: 0.95 ESCr: 0.01 Non-u	niform PCDr: 1.00 ESRr: 0.00 ur PCDr: 0.99 ESRr: 0.10 niform	Blue d Blue d PDDr: 0.89 ESCr: 0.34 Rand PDDr: 0.97 ESCr: 0.15 Blue d	PCDr: 0.94 ESRr: 0.14 dom PCDr: 0.94 ESR: 0.14
synthesis10 point_num: 51416 class_num: 5	Original + Transparent Original Original Original Original Original Original Original Original + Transparent	Non-u PDDr: 0.89 ESCr: 0.22 O PDDr: 0.95 ESCr: 0.01 Non-u	niform PCDr: 1.00 ESRr: 0.00 ur PCDr: 0.99 ESRr: 0.10 niform	Blue of the second seco	noise PCDr: 0.94 ESRr: 0.14 dom PCDr: 0.94 ESRr: 0.18 ESRr: 0.18
synthesis10 point_num: 51416 class_num: 5	Original + Transparent Original Original Original Original Original Original Original + Transparent	Non-u PDDr: 0.89 ESCr: 0.22 O PDDr: 0.95 ESCr: 0.01 Non-u	niform PCDr: 1.00 ESRr: 0.00 ur PCDr: 0.99 ESRr: 0.10 niform PCDr: 0.95	Blue (PDDr: 0.89 ESCr: 0.34 PDDr: 0.97 ESCr: 0.15 Blue (PDDr: 0.97 ESCr: 0.15	noise PCDr: 0.94 ESRr: 0.14 dom PCDr: 0.94 ESR: 0.18 noise





	Original	Our		Random	
synthesis8 point_num: 37423 class_num: 4					
		PDDr: 0.96	PCDr: 1.00	PDDr: 0.97	PCDr: 0.98
		ESCr: 0.01	ESRr: 0.06	ESCr: 0.07	ESRr: 0.17
	Original + Transparent	Non-uniform		Blue noise	
	•				
		PDDr: 0.93	PCDr: 0.98	PDDr: 0.91	PCDr: 0.97
		ESCr: 0.06	ESRr: 0.01	ESCr: 0.09	ESRr: 0.15
	Original	0	ur	Rand	dom
		PDDr: 0.95	PCDr: 0.99	PDDr: 0.97	PCDr: 0.94
synthesis9		ESCr: 0.02	ESRr: 0.10	ESCr: 0.19	ESRr: 0.23
point_num: 45698		Non-uniform		Blue noise	
	Original + Transparent	Non-u	niform	Blue	noise
class_num: 5	Original + Transparent	Non-u	niform	Blue	noise
class_num: 5	Original + Transparent	Non-u	niform	Blue	PCDr: 0.93
class_num: 5	Original + Transparent	Non-u	niform PCDr: 0.94 ESRr: 0.00	Blue PDDr: 0.90 ESCr: 0.24	PCDr: 0.93 ESRr: 0.21
class_num: 5	Original + Transparent	Non-u PDDr: 0.90 ESCr: 0.19	niform PCDr: 0.94 ESRr: 0.00 ur	Blue PDDr: 0.90 ESCr: 0.24 Rand	PCDr: 0.93 ESRr: 0.21
class_num: 5	Original + Transparent	Non-u PDDr: 0.90 ESCr: 0.19 O	niform PCDr: 0.94 ESRr: 0.00 ur	Blue PDDr: 0.90 ESCr: 0.24 Rand	PCDr: 0.93 ESRr: 0.21 dom
class_num: 5	Original + Transparent	Non-u PDDr: 0.90 ESCr: 0.19 O	niform PCDr: 0.94 ESRr: 0.00 ur PCDr: 0.82	Blue PDDr: 0.90 ESCr: 0.24 Rand	noise PCDr: 0.93 ESRr: 0.21 dom
class_num: 5	Original + Transparent	Non-u PDDr: 0.90 ESCr: 0.19 O PDDr: 0.91 ESCr: 0.48	niform PCDr: 0.94 ESRr: 0.00 PCDr: 0.82 ESRr: 0.03	Blue PDDr: 0.90 ESCr: 0.24 PDDr: 0.95 ESCr: 0.88	noise PCDr: 0.93 ESRr: 0.21 dom PCDr: 0.78 PCDr: 0.78 ESRr: 0.18
terrorism point_num: 177133	Original + Transparent Original Original Original Original Original Original Original + Transparent	Non-u PDDr: 0.90 ESCr: 0.19 O PDDr: 0.91 ESCr: 0.48 Non-u	niform PCDr: 0.94 ESRr: 0.00 ur PCDr: 0.82 ESRr: 0.03 niform	Blue PDDr: 0.90 ESCr: 0.24 Rand PDDr: 0.95 ESCr: 0.88 Blue	noise PCDr: 0.93 ESRr: 0.21 dom PCDr: 0.78 ESRr: 0.18 ESRr: 0.18
terrorism point_num: 177133 class_num: 4	Original + Transparent Original Original Original Original Original Original Original Original + Transparent	Non-u PDDr: 0.90 ESCr: 0.19 O PDDr: 0.91 ESCr: 0.48 Non-u	niform PCDr: 0.94 ESRr: 0.00 ur PCDr: 0.82 ESRr: 0.03 niform	Blue PDDr: 0.90 ESCr: 0.24 Rand PDDr: 0.95 ESCr: 0.88 Blue	noise PCDr: 0.93 ESRr: 0.21 dom PCDr: 0.78 ESRr: 0.18 noise
terrorism point_num: point_num: 177133 class_num: 4	Original + Transparent Original Original Original Original Original Original Original Original + Transparent	Non-u PDDr: 0.90 ESCr: 0.19 O PDDr: 0.91 ESCr: 0.48 Non-u	niform PCDr: 0.94 ESRr: 0.00 ur PCDr: 0.82 ESRr: 0.03 niform PCDr: 0.78	Blue PDDr: 0.90 ESCr: 0.24 PDDr: 0.95 ESCr: 0.88 Blue PDDr: 0.95 ESCr: 0.88	noise PCDr: 0.93 ESRr: 0.21 dom PCDr: 0.78 ESRr: 0.18 ESRr: 0.18 noise

	Original	Our		Random	
wine reviews		PDDr: 0.97	PCDr: 0.48	PDDr: 0.99	PCDr: 0.67
point_num:		ESCr: 0.53	ESRr: 0.04	ESCr: 0.68	ESRr: 0.11
112945 class_num: 6	Original + Transparent	Non-uniform		Blue noise	
		• • • •			
		PDDr: 0.92	PCDr: 0.45	PDDr: 0.01	PCDr: 0.42
		ESCr: 2.12	ESRr: 0.00	ESCr: 5.93	ESRr: 0.04



Input: a multi-class scatterplot matrix

Output: our sampled result



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