biosensors

MDPI

Supplementary Information

Chemometric Assisted Colorimetric Based Inexpensive Paper Biosensor for Glucose Detection

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Table S1. EDX analysis of papers.

Types of Paper	Elemental Analysis													
	C		O		Si		Al		Ca		Mg		Cl	
Whatman No.1	45.24	52.37	54.81	47.64										
Bond Paper	40.28	48.45	55.28	49.93	0.11	0.06			4.33	1.56				
Craft Paper (200 GSM)	33.58	40.91	63.37	57.96	0.09	0.05			2.96	1.08				
Handmade/ Blotting Paper	44.62	52.36	52.57	46.32	1.54	0.77	0.59	0.31	0.69	0.24				
Paper Towel (2-Ply)	44.81	52.06	54.82	47.81					0.37	0.13				
Glossy Paper	42.70	50.45	54.85	48.65	0.16	0.08			2.28	0.81				
300GSM Card Sheet	43.89	51.05	55.99	48.90	0.02	0.01			0.10	0.04				
Practical Sheet Paper	37.14	46.32	52.59	49.23	1.67	0.89			7.19	2.69	1.41	0.87		
Ivory Sheet	43.58	51.27	53.40	47.17	1.78	0.90			0.22	0.08	1.02	0.59		
Sketch Sheet	44.68	52.21	53.21	46.67	1.28	0.64					0.83	0.48		
Drawing Sheet	43.45	50.74	55.75	48.88	0.67	0.33			0.13	0.05				
A-4 Paper (Normal Printing Paper) 67 GSM	34.76	43.12	58.24	54.24					6.22	2.31			0.78	0.33
Whatman No.4	46.12	52.90	53.88	47.10										

Weight Percentage	Atomic Percentage

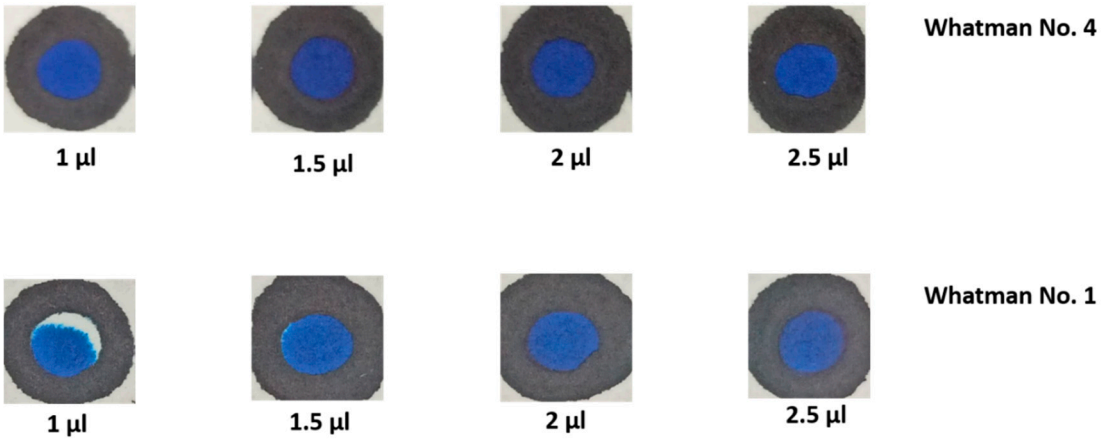


Figure S1. Sample and reagent volume optimization using MB dye solution

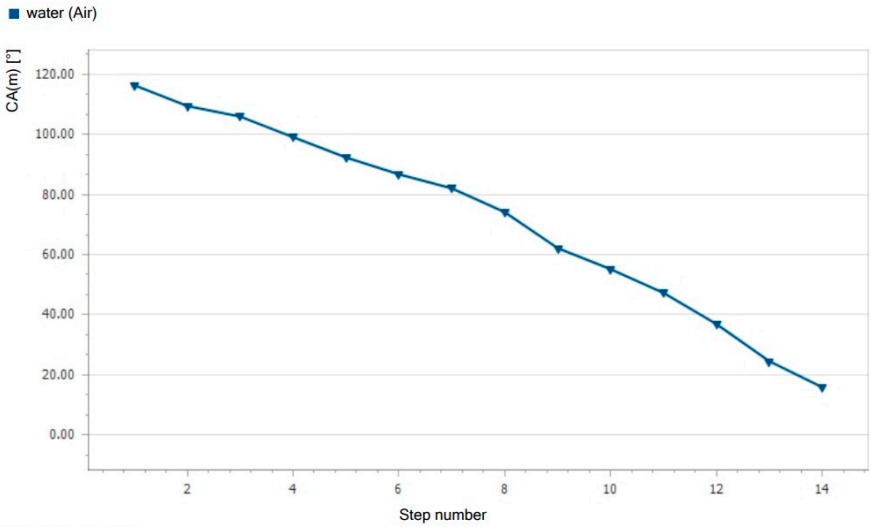


Figure S2. Contact angle measurement of single stroke coated ink over Whatman.4 paper

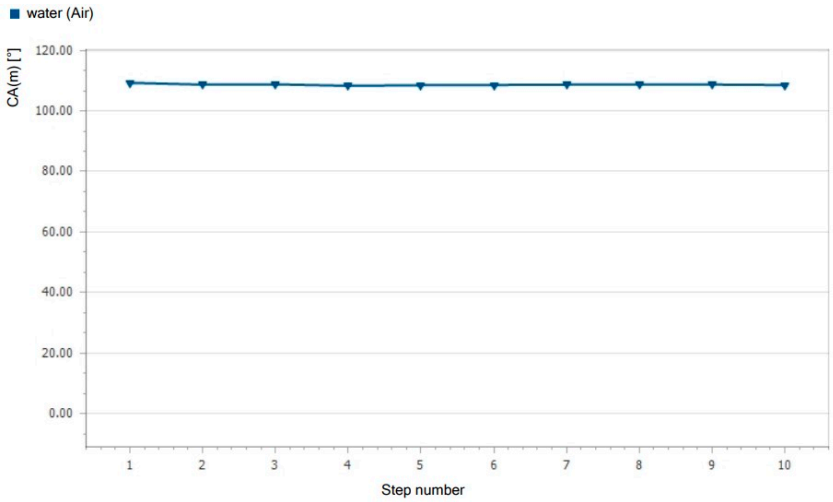


Figure S3. Contact angle measurement of double stroke coated ink over Whatman.4 paper

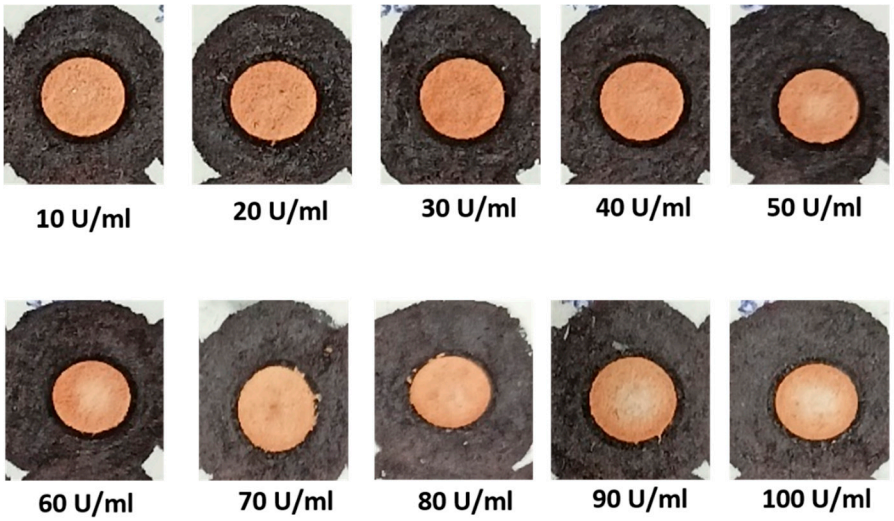


Figure S4. Colour development observed for different HRP concentration

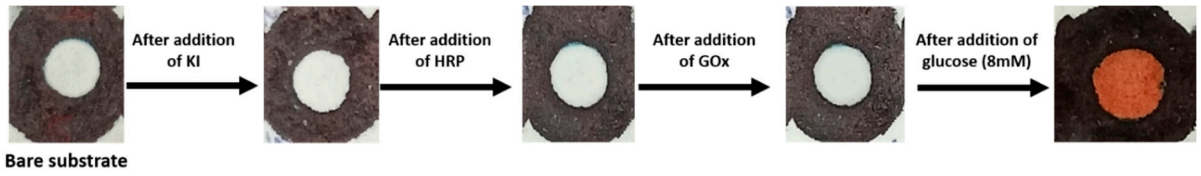


Figure S5. Comparison of spots after addition of each reagent

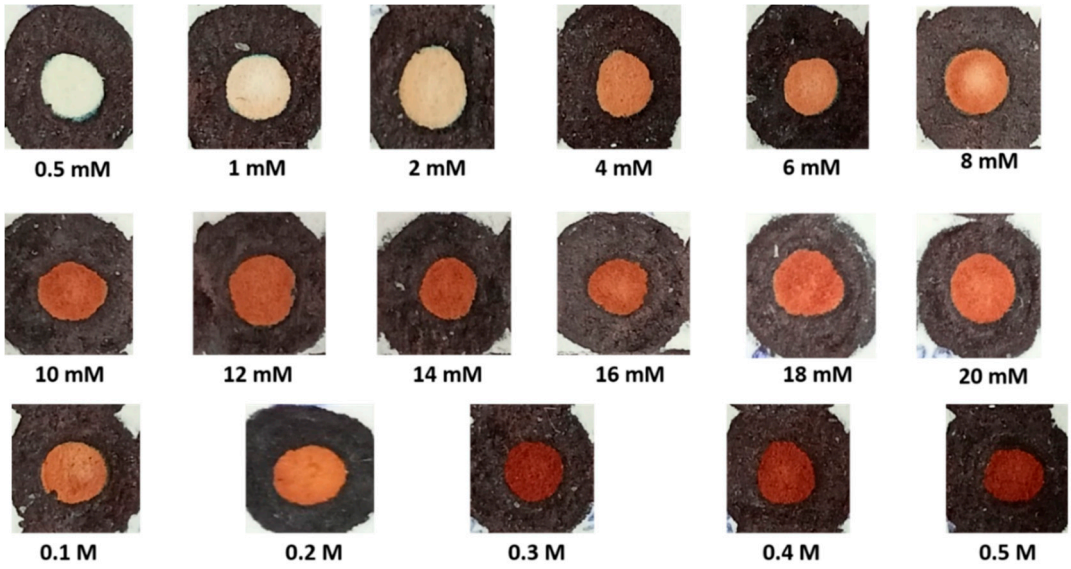


Figure S6. Colour development observed for each concentration of glucose solution

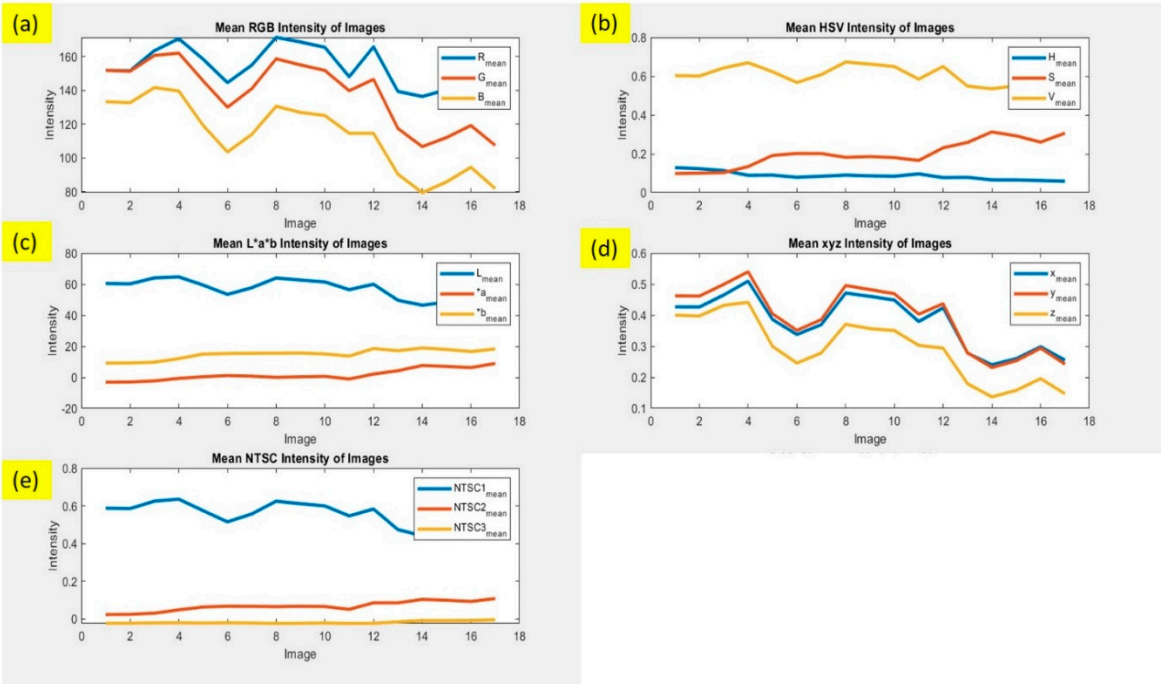


Figure S7. The variation of mean intensity values of all the training images (a) RGB (b) HSV (c) L*a*b (d) xyz (e) NTSC.

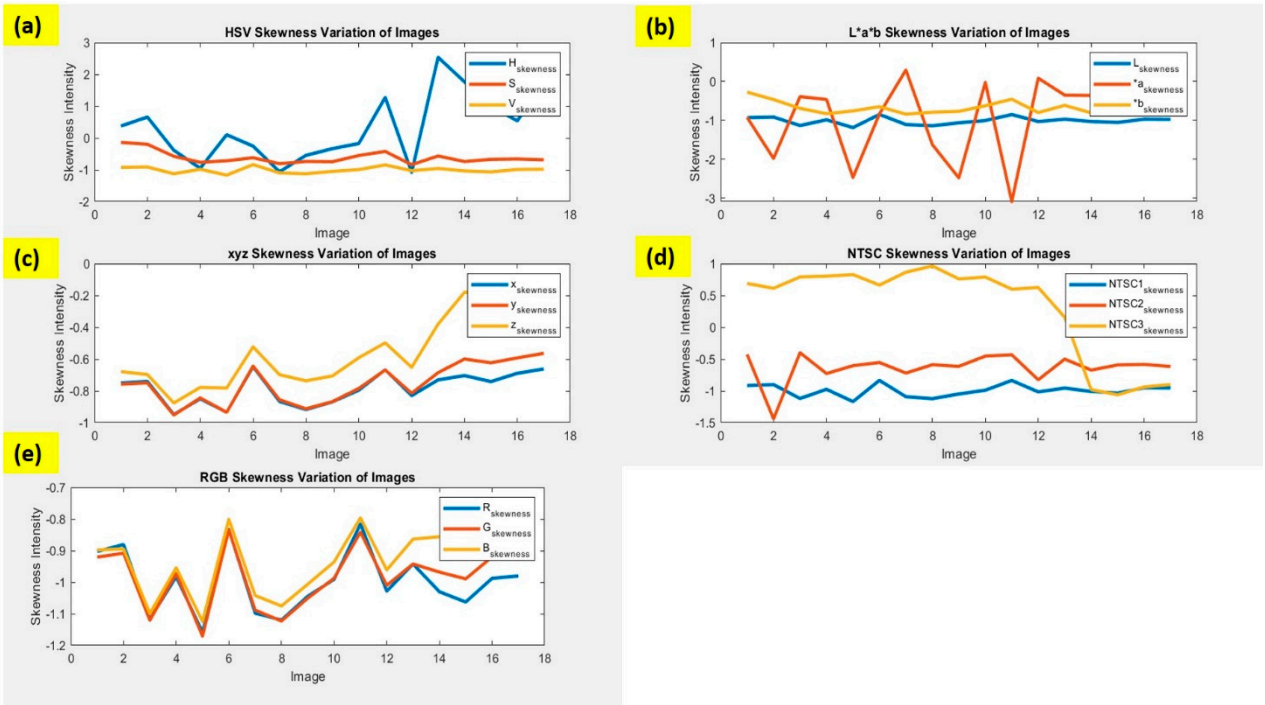


Figure S8. The variation of overall skewness of all the training images (a) HSV (b) L*a*b (c) xyz (d) NTSC (e) RGB

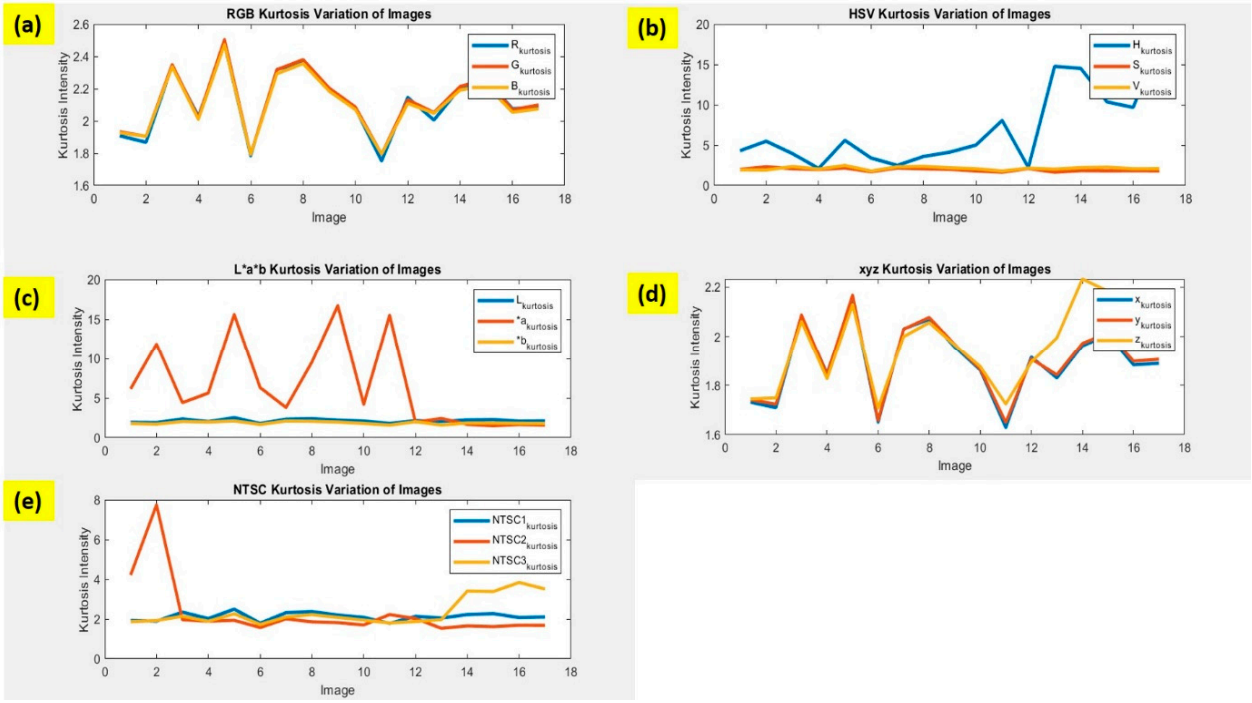


Figure S9. The variation of overall kurtosis of all the training images (a) RGB (b) HSV (c) L*a*b (d) xyz (e) NTSC.

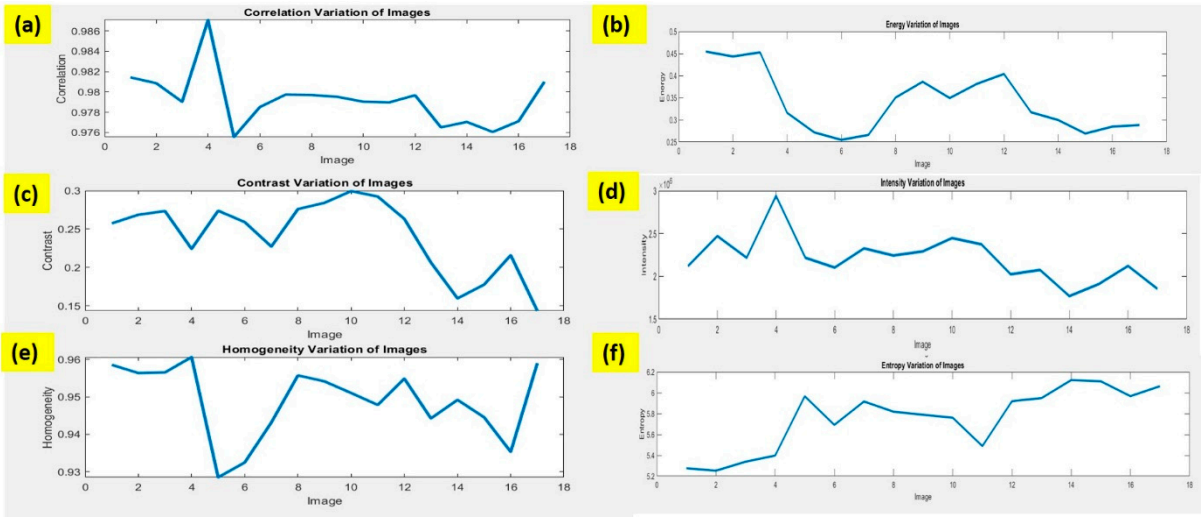


Figure S10. The variation of overall values of training images obtained from GLCM (a) correlation, (b) energy, (c) contrast, (d) intensity, (e) homogeneity, and (f) entropy.

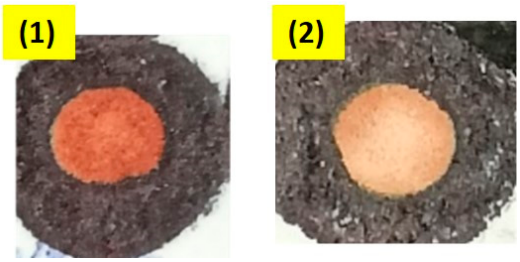


Figure S11. Colour image of unknown samples for the testing of trained data.

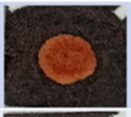
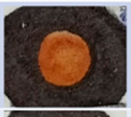
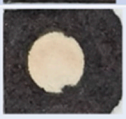
0 day	**With Trehalose**	**Without Trehalose**
At RT		
After 3 days	**With Trehalose**	**Without Trehalose**
At RT		
At 4° C		
After 7 days	**With Trehalose**	**Without Trehalose**
At RT		
At 4° C		
After 14 days	**With Trehalose**	**Without Trehalose**
At RT		
At 4° C		

Figure S12. Shelf-life testing of spots kept at room temperature and at 4º C for 14 days