Supplementary Material **open**access

Hyperspectral system trade-offs for illumination, hardware and analysis methods: a case study of seed mix ingredient discrimination

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Table S1. Impact of input image block size on CNN performance (pixel accuracy), Snapscan image under halogen illumination.

Block size	CNN feature size	Mean accuracy	Minimum accuracy	Iterations required	Convergence time (s)
1×1	9	73.3%	50.1%	35	90.0
3×3	9×9=81	84.6%	68.0%	35	87.0
5×5	25×9=225	87.9%	75.7%	35	94.3
7×7	49×9=441	89.1%	74.3%	25	75.6
9×9	81×9=729	90.0%	76.2%	25	101.0
11×11	121×9=1089	89.4%	71.0%	25	119.2

Table S2. Impact of Median Filtering for Snapscan, Mosaic VIS and Mosaic NIR.

Camera	Snapscan (halogen)				Mosaic VIS (halogen)				Mosaic NIR (halogen)			
Classifier & Pre-processing	QDC		CNN		QDC		CNN		QDC		CNN	
	Mean	Min	Mean	Min	Mean	Min	Mean	Min	Mean	Min	Mean	Min
None	70.4%	45.9%	89.1%	74.3%	45.5%	2.3%	78.8%	50.7%	50.2%	5.6%	76.1%	51.1%
MF	80.8%	61.9%	88.8%	75.0%	52.6%	9.1%	83.0%	70.9%	55.3%	24.0%	70.0%	26.9%

Table S3. Impact of post-processing steps.

Camera	Snapscan (halogen)				Mosaic VIS (LED)				Mosaic NIR (LED)			
Classifier & Post-process	QDC		CNN		QDC		CNN		QDC		CNN	
	Mean	Min	Mean	Min	Mean	Min	Mean	Min	Mean	Min	Mean	Min
None	70.4%	45.9%	89.1%	74.3%	52.5%	9.3%	80.5%	59.3%	49.4%	6.1%	83.1%	63.8%
MF	76.0%	46.6%	89.5%	74.1%	57.1%	11.6%	81.2%	59.9%	53.9%	8.0%	84.8%	66.0%
BF	81.5%	55.4%	90.3%	71.1%	59.3%	0.4%	83.2%	60.3%	49.4%	6.1%	83.1%	63.9%
BF + MF	81.6%	55.5%	90.3%	73.8%	59.5%	0.1%	83.3%	60.5%	53.9%	8.0%	84.9%	66.0%