

Table S1. Detailed structural parameters of the AE-1D.

AE-1D (Strawberry dataset)		AE-1D (Blueberry dataset)	
Layers	Parameters	Layers	Parameters
Input	Features=181	Input	Features=181
Fully_connected_1	Nodes=32, Activation=ReLu	Fully_connected_1	Nodes=32, Activation=ReLu
Fully_connected_2	Nodes=16, Activation=ReLu	Fully_connected_2	Nodes=32, Activation=ReLu
Fully_connected_3	Nodes=32, Activation=ReLu	Fully_connected_3	Nodes=16, Activation=ReLu
Output	Nodes=181, Activation=Sigmoid	Fully_connected_4	Nodes=32, Activation=ReLu
		Fully_connected_5	Nodes=32, Activation=ReLu
		Output	Nodes=181, Activation=Sigmoid

Table S2. Detailed structural parameters of the AE-2D.

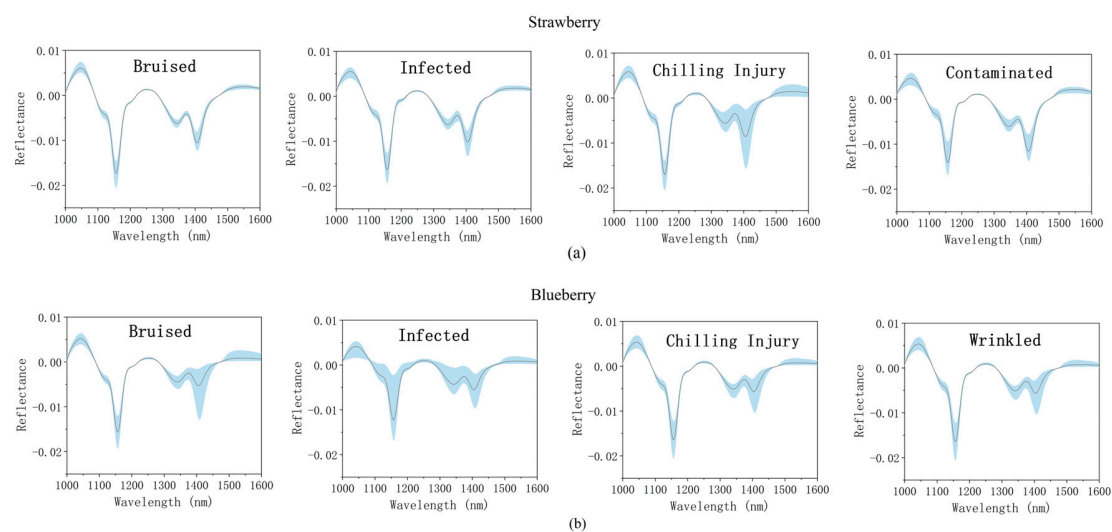
AE-2D (Strawberry dataset)		AE-2D (Blueberry dataset)	
Layers	Parameters	Layers	Parameters
Input	120×120×5	Input	60×60×5
Conv2D_1	64, 3×3, Strids=2×2, ReLu	Conv2D_1	64, 3×3, Strids=2×2, ReLu
Conv2D_2	64, 3×3, Strids=2×2, ReLu	Conv2D_2	64, 3×3, Strids=2×2, ReLu
Conv2D_3	64, 3×3, Strids=2×2, ReLu	Trans Conv2D_1	64, 3×3, Strids=2×2, ReLu
Trans Conv2D_1	64, 3×3, Strids=2×2, ReLu	Trans Conv2D_2	64, 3×3, Strids=2×2, ReLu
Trans Conv2D_2	64, 3×3, Strids=2×2, ReLu	Trans Conv2D_4	5, 3×3, Strids=1×1
Trans Conv2D_3	64, 3×3, Strids=2×2, ReLu		
Trans Conv2D_4	5, 3×3, Strids=1×1		

Table S3. Detailed structural parameters of the VAE-2D.

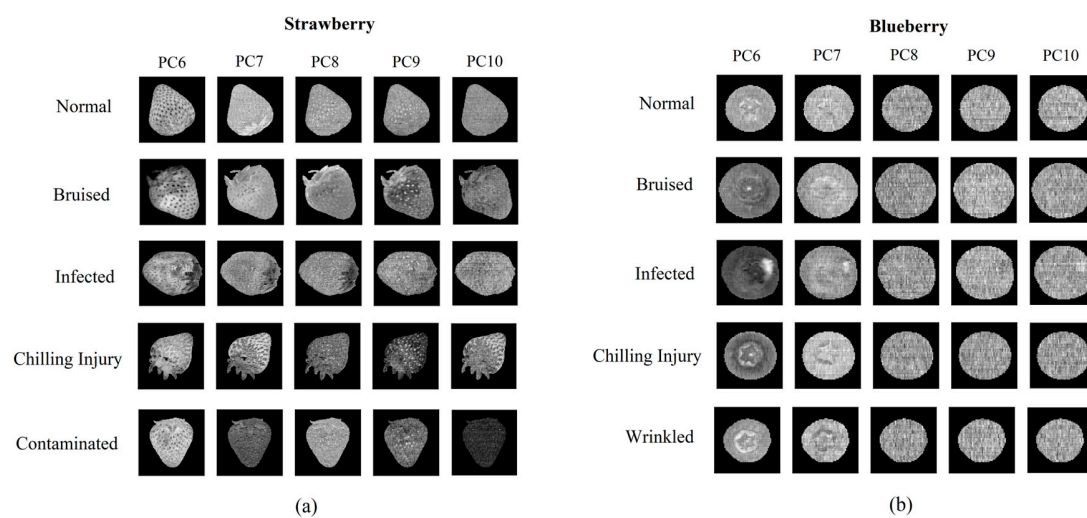
VAE-2D (Strawberry dataset)		VAE-2D (Blueberry dataset)	
Layers	Parameters	Layers	Parameters
Input	120×120×5	Input	60×60×5
Conv2D_1	64, 3×3, Strids=2×2, ReLu	Conv2D_1	64, 3×3, Strids=2×2, ReLu
Conv2D_2	64, 3×3, Strids=2×2, ReLu	Conv2D_2	64, 3×3, Strids=2×2, ReLu
Conv2D_3	64, 3×3, Strids=2×2, ReLu	FC_1 (z_mean)	Nodes=64
FC_1 (z_mean)	Nodes=256	FC_2 (z_std)	Nodes=64
FC_2 (z_std)	Nodes=256	FC_3	Nodes=15*15*2, ReLu
FC_3	Nodes=15*15*4, ReLu	Trans Conv2D_1	64, 3×3, Strids=2×2, ReLu
Trans Conv2D_1	64, 3×3, Strids=2×2, ReLu	Trans Conv2D_2	64, 3×3, Strids=2×2, ReLu
Trans Conv2D_2	64, 3×3, Strids=2×2, ReLu	Trans Conv2D_4	5, 3×3, Strids=1×1
Trans Conv2D_3	64, 3×3, Strids=2×2, ReLu		
Trans Conv2D_4	5, 3×3, Strids=1×1		

Table S4. The testing time per sample obtained by different methods.

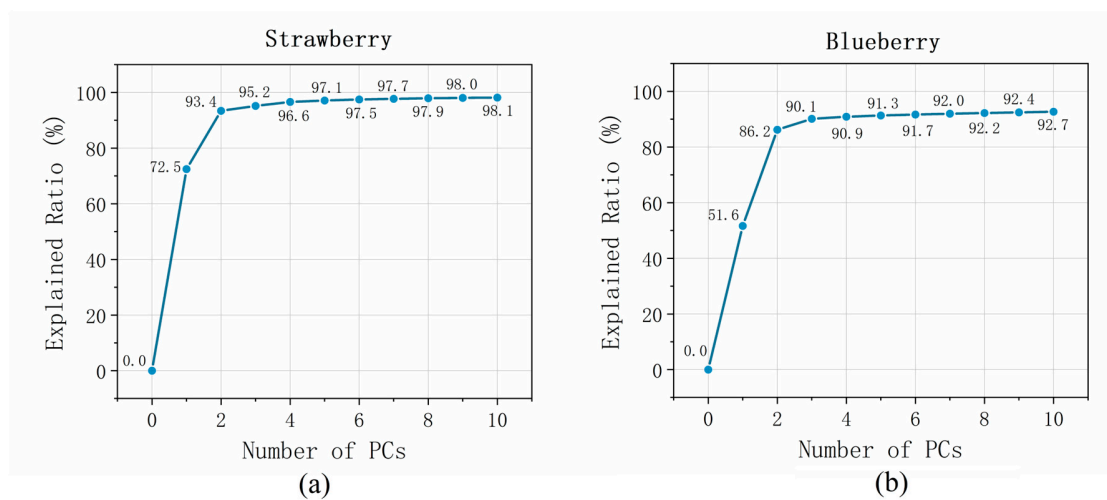
	OCSVM	AE-1D	VAE-1D	AE-2D	VAE-2D	SSAD
Testing time per sample (ms)	0.015	4.341	27.295	4.665	28.779	0.027



**Figure S1.** Spectral profiles of samples in different anomalous classes: (a) strawberry data set; (b) blueberry data set. **Gray lines:** mean spectral curves, **colored areas:** spectral profiles of all the samples.



**Figure S2.** Images of PC6 to PC10 for the strawberry and blueberry data sets.



**Figure S3.** The variable explained ratios of the principal components: (a) strawberry data set; (b) blueberry data set.