AutoVI Software
USER GUIDE

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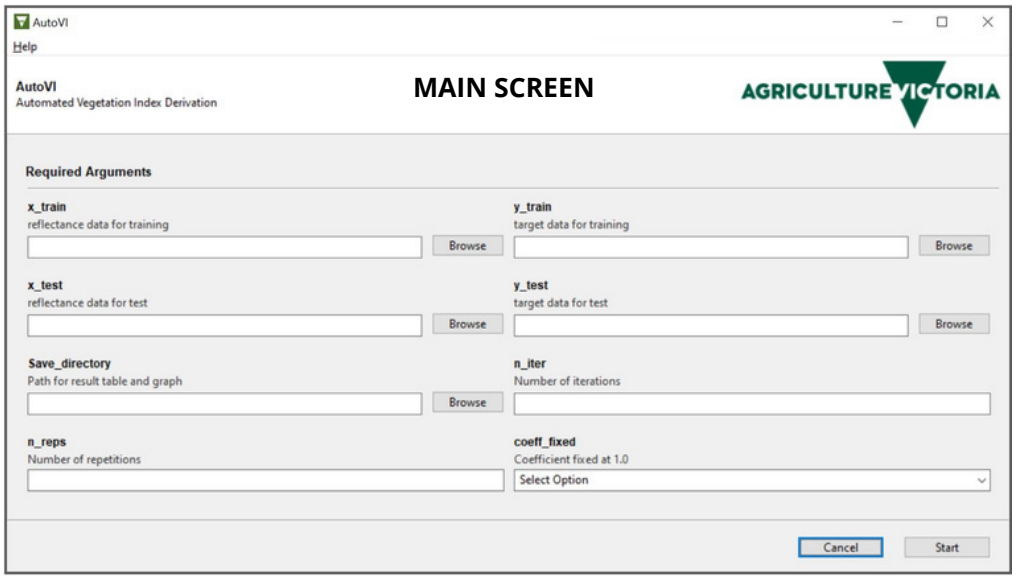
INSTALLATION

1. Launch AutoVI_setup. Accept license agreement to proceed.
2. AutoVI installs by default to C:/AutoVI. You may change the installation folder.
3. You may uninstall AutoVI via Control Panel under uninstall or change a program.

SETUP



Main arguments required by AutoVI:

x-train - reflectance data for AutoVI training normalized to range of 0 - 1 in .csv file. Columns should correspond to wavebands and rows to reflectance values. All columns should have unique naming.

y-train - target trait values for AutoVI training in .csv file. Column should be named as "Target".

x_test - reflectance data for AutoVI validation normalized to range of 0 - 1 in .csv file.

y_test - target trait values for AutoVI validation in .csv file.

Save_directory - folder to output result table and graph.

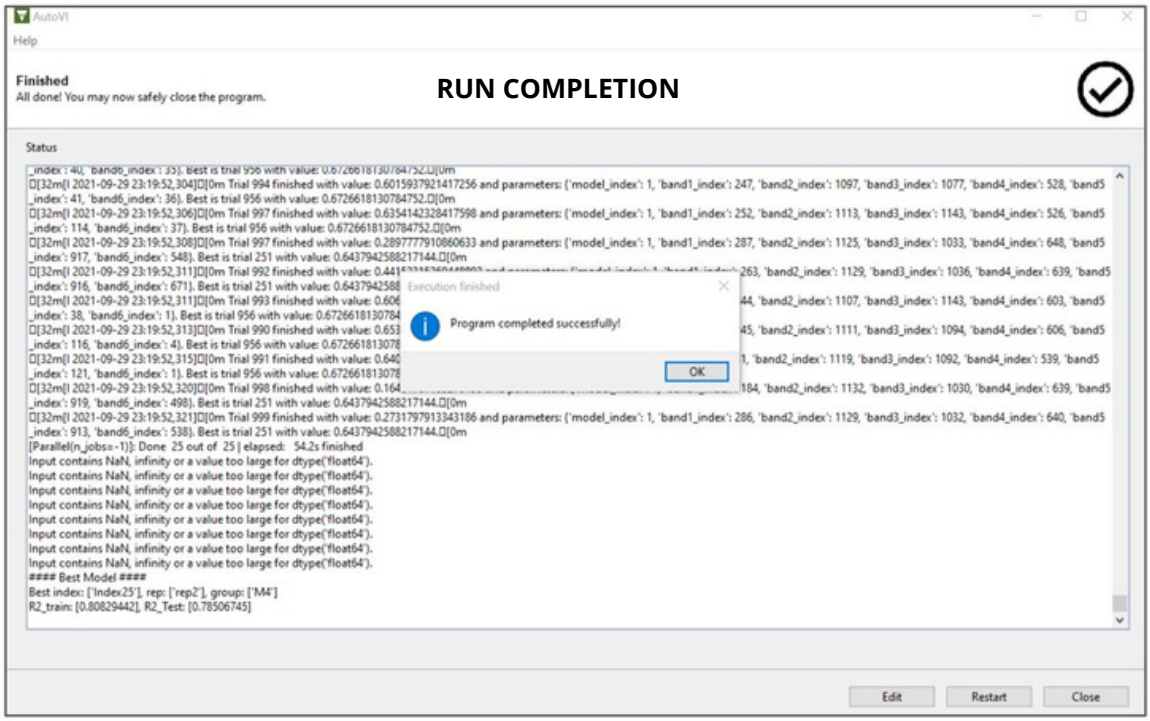
n_iter - number of iterations, with 1,000 to 20,000 iterations as recommended starting point.

n_reps - number of repetitions, with 3 to 5 as recommended starting point.

coeff_fixed - if True, coefficients will be excluded from index model equations.

RUNNING

1. Once all arguments are provided, click **Start** to begin AutoVI training. Depending on hardware and AutoVI settings, the entire process can take as little as a few minutes to few hours.
2. Upon completion, the best model and R^2 scores for training and test datasets will be displayed.
3. You can choose to either **Edit**, **Restart** or **Close** the program. Choosing **Edit** will bring you back to the main screen and **Restart** simply begins another AutoVI training with the same settings.



RESULTS

AutoVI results will be saved under the specified save_directory. Two outputs are provided:

- **AutoVI_models (.csv)** - table showing best index models across repetitions according to model groups. In addition to R^2 for training (Score), performance metrics such as R^2, RMSE, MAE and MAPE are shown for the test dataset.
- **AutoVI_graph (.jpg)** - bar chart showing R^2 scores on the test dataset for the best index models across repetitions according to model groups.

AutoVI_models (.csv)

Model_name	Rep	Group	Hyperparameters [[bands],[coefficients]]	Score	R2	RMSE	MAE	MAPE
Index9	rep1	M2	[['719', '761'], [1.0, 1.0]]	0.6149	0.4464	64.1899	51.6181	0.0784
Index8	rep2	M2	[['714', '1135'], [1.0, 1.0, 1.0]]	0.5909	0.3804	67.9132	55.0215	0.0841
Index2	rep3	M2	[['1391', '1404']]	0.5347	0.2210	76.1477	56.3060	0.0871
Index3	rep4	M2	[['1438', '678']]	0.6192	0.3868	67.5589	56.2409	0.0872
Index4	rep5	M2	[['1264', '1412'], [1.0, 1.0]]	0.5667	0.2408	75.1709	60.3920	0.0934
Index17	rep1	M3	[['1141', '1185', '976']]	0.5431	0.2448	74.9728	57.9585	0.0897
Index16	rep2	M3	[['1263', '715', '1201'], [1.0]]	0.5777	0.5311	59.0800	47.9831	0.0724
Index15	rep3	M3	[['642', '733', '749']]	0.6989	0.6161	53.4533	43.8691	0.0673

AutoVI_graph (.jpg)