

Analysing Temporal Effects on Classification of SAR and Optical Images

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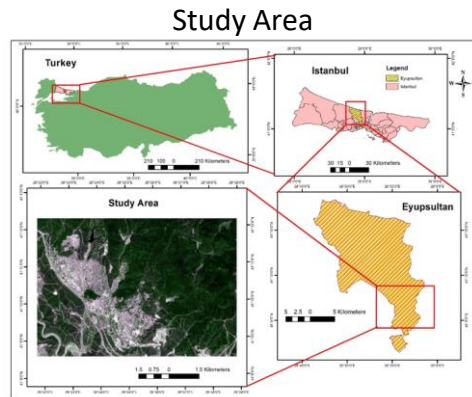


Figure 1. Study Area

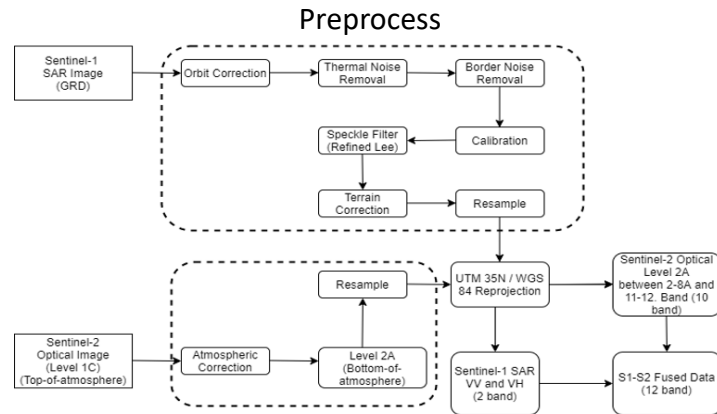


Figure 3. Preprocess of Optical and SAR Images

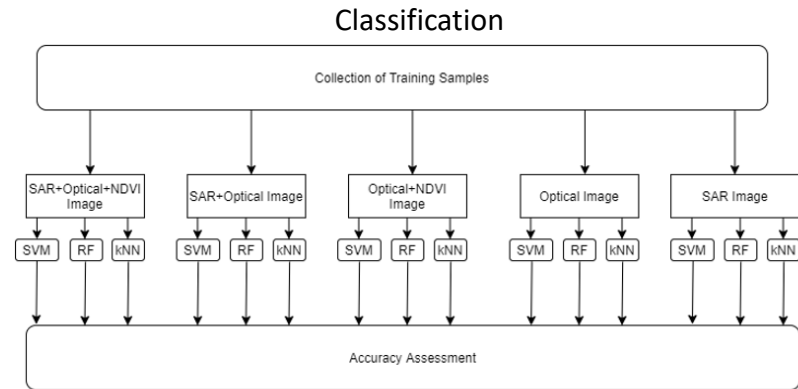
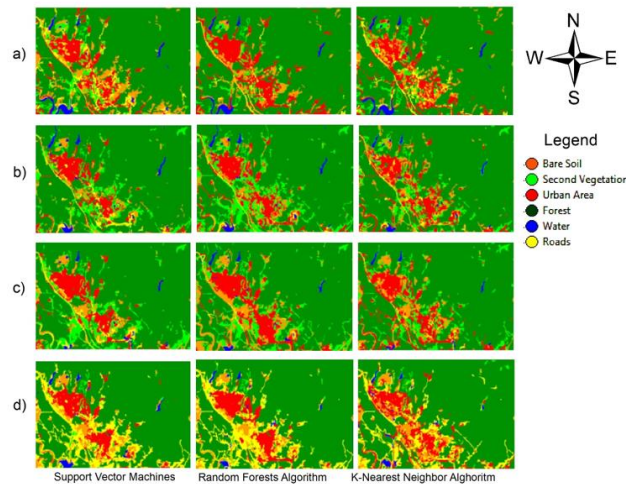


Figure 5. Classification Work Flow

CLASSIFICATION MAP FOR FUSION WITH NDVI IMAGE



Results

| | Support Vector Machines | | Random Forest | | K-Nearest Neighbors | | | Support Vector Machines | | Random Forest | | K-Nearest Neighbors | |
|------------------------|-------------------------|-------|----------------------|-------|----------------------|-------|------------------------|-------------------------|-------|----------------------|-------|----------------------|-------|
| | General Accuracy (%) | Kappa | General Accuracy (%) | Kappa | General Accuracy (%) | Kappa | | General Accuracy (%) | Kappa | General Accuracy (%) | Kappa | General Accuracy (%) | Kappa |
| February 2020 | | | | | | | August 2020 | | | | | | |
| Optical+SAR+NDVI Image | 91.29 | 0.869 | 95 | 0.924 | 95.12 | 0.926 | Optical+SAR+NDVI Image | 94.78 | 0.911 | 94.11 | 0.900 | 89.18 | 0.802 |
| Optical+SAR Image | 92.87 | 0.892 | 91.92 | 0.879 | 95.12 | 0.926 | Optical+SAR Image | 94.46 | 0.906 | 94.74 | 0.910 | 89.18 | 0.802 |
| Optical+NDVI Image | 87.9 | 0.816 | 88.71 | 0.835 | 93.09 | 0.896 | Optical+NDVI Image | 94.20 | 0.901 | 87.51 | 0.789 | 87.01 | 0.862 |
| Optical Image | 89.18 | 0.837 | 88.1 | 0.824 | 93.09 | 0.896 | Optical Image | 94.32 | 0.903 | 88.95 | 0.811 | 87.01 | 0.862 |
| SAR Image | 54.16 | 0.033 | 81.66 | 0.734 | 84.93 | 0.773 | SAR Image | 61.11 | 0.037 | 85.91 | 0.752 | 83.46 | 0.712 |
| May 2020 | | | | | | | October 2020 | | | | | | |
| Optical+SAR+NDVI Image | 93.87 | 0.897 | 93.09 | 0.885 | 89.42 | 0.821 | Optical+SAR+NDVI Image | 94.67 | 0.923 | 93.55 | 0.907 | 89.11 | 0.843 |
| Optical+SAR Image | 94.49 | 0.907 | 93.62 | 0.894 | 89.42 | 0.821 | Optical+SAR Image | 93.22 | 0.903 | 93.7 | 0.909 | 89.11 | 0.843 |
| Optical+NDVI Image | 93.57 | 0.892 | 91.18 | 0.855 | 89.34 | 0.822 | Optical+NDVI Image | 92.9 | 0.897 | 87.58 | 0.831 | 88.6 | 0.843 |
| Optical Image | 88.96 | 0.822 | 90.47 | 0.843 | 89.34 | 0.822 | Optical Image | 92.85 | 0.902 | 85.61 | 0.806 | 88.6 | 0.843 |
| SAR Image | 59.58 | 0.032 | 82.83 | 0.722 | 82.47 | 0.706 | SAR Image | 40.46 | 0.013 | 78.98 | 0.711 | 79.51 | 0.716 |