**Supplementary Material 1 - Post-Processing Operation Results**

| Test Area | operation | recall | precision | f1-score | iou |
|---|---|---|---|---|---|
| 1 | opening | 0.48 | 0.56 | 0.52 | 0.35 |
| 1 | closing | 0.47 | 0.57 | 0.52 | 0.35 |
| 1 | erosion | 0.55 | 0.46 | 0.50 | 0.33 |
| 1 | dilation | 0.40 | 0.65 | 0.50 | 0.33 |
| 1 | binary_opening + binary_closing | 0.48 | 0.56 | 0.52 | 0.35 |
| 1 | binary_opening + binary_erosion | 0.55 | 0.46 | 0.50 | 0.33 |
| 1 | binary_opening + binary_dilation | 0.42 | 0.64 | 0.50 | 0.34 |
| 1 | binary_closing + binary_opening | 0.48 | 0.56 | 0.52 | 0.35 |
| 1 | binary_closing + binary_erosion | 0.55 | 0.46 | 0.50 | 0.33 |
| 1 | binary_closing + binary_dilation | 0.40 | 0.65 | 0.50 | 0.33 |
| 1 | binary_erosion + binary_opening | 0.56 | 0.44 | 0.50 | 0.33 |
| 1 | binary_erosion + binary_closing | 0.55 | 0.46 | 0.50 | 0.33 |
| 1 | binary_erosion + binary_dilation | 0.48 | 0.56 | 0.52 | 0.35 |
| 1 | binary_dilation + binary_opening | 0.56 | 0.44 | 0.50 | 0.33 |
| 1 | binary_dilation + binary_closing | 0.55 | 0.46 | 0.50 | 0.33 |
| 1 | binary_dilation + binary_erosion | 0.48 | 0.56 | 0.52 | 0.35 |
| 1 | binary_opening + binary_closing + binary_dilation | 0.55 | 0.46 | 0.50 | 0.33 |
| 1 | binary_closing + binary_dilation + binary_erosion | 0.48 | 0.56 | 0.52 | 0.35 |
| 1 | binary_dilation + binary_erosion + binary_opening | 0.48 | 0.56 | 0.52 | 0.35 |
| 1 | binary_erosion + binary_opening + binary_closing | 0.40 | 0.65 | 0.50 | 0.33 |
| 1 | binary_opening + binary_closing + binary_erosion + binary_dilation | 0.48 | 0.56 | 0.52 | 0.35 |
| 1 | binary_closing + binary_erosion + binary_dilation + binary_opening | 0.48 | 0.56 | 0.52 | 0.35 |
| 1 | binary_erosion + binary_dilation + binary_opening + binary_closing | 0.48 | 0.56 | 0.52 | 0.35 |

| | | | | | |
|---|---|---|---|---|---|
| 1 | binary_dilation + binary_opening + binary_closing + binary_erosion | 0.47 | 0.57 | 0.51 | 0.35 |
| 2 | opening | 0.50 | 0.56 | 0.53 | 0.36 |
| 2 | closing | 0.50 | 0.57 | 0.53 | 0.36 |
| 2 | erosion | 0.55 | 0.47 | 0.51 | 0.34 |
| 2 | dilation | 0.44 | 0.65 | 0.53 | 0.36 |
| 2 | binary_opening + binary_closing | 0.50 | 0.56 | 0.53 | 0.36 |
| 2 | binary_opening + binary_erosion | 0.55 | 0.47 | 0.51 | 0.34 |
| 2 | binary_opening + binary_dilation | 0.45 | 0.63 | 0.53 | 0.36 |
| 2 | binary_closing + binary_opening | 0.50 | 0.56 | 0.53 | 0.36 |
| 2 | binary_closing + binary_erosion | 0.55 | 0.48 | 0.51 | 0.34 |
| 2 | binary_closing + binary_dilation | 0.44 | 0.65 | 0.53 | 0.36 |
| 2 | binary_erosion + binary_opening | 0.57 | 0.46 | 0.51 | 0.34 |
| 2 | binary_erosion + binary_closing | 0.55 | 0.47 | 0.51 | 0.34 |
| 2 | binary_erosion + binary_dilation | 0.50 | 0.56 | 0.53 | 0.36 |
| 2 | binary_dilation + binary_opening | 0.57 | 0.46 | 0.51 | 0.34 |
| 2 | binary_dilation + binary_closing | 0.55 | 0.47 | 0.51 | 0.34 |
| 2 | binary_dilation + binary_erosion | 0.50 | 0.56 | 0.53 | 0.36 |
| 2 | binary_opening + binary_closing + binary_dilation | 0.55 | 0.47 | 0.51 | 0.34 |
| 2 | binary_closing + binary_dilation + binary_erosion | 0.50 | 0.56 | 0.53 | 0.36 |
| 2 | binary_dilation + binary_erosion + binary_opening | 0.50 | 0.56 | 0.53 | 0.36 |
| 2 | binary_erosion + binary_opening + binary_closing | 0.44 | 0.65 | 0.53 | 0.36 |
| 2 | binary_opening + binary_closing + binary_erosion + binary_dilation | 0.50 | 0.56 | 0.53 | 0.36 |
| 2 | binary_closing + binary_erosion + binary_dilation + binary_opening | 0.50 | 0.56 | 0.53 | 0.36 |
| 2 | binary_erosion + binary_dilation + binary_opening + binary_closing | 0.50 | 0.56 | 0.53 | 0.36 |
| 2 | binary_dilation + binary_opening + binary_closing + binary_erosion | 0.49 | 0.57 | 0.53 | 0.36 |
| 3 | opening | 0.57 | 0.62 | 0.59 | 0.42 |
| 3 | closing | 0.55 | 0.65 | 0.60 | 0.42 |
| 3 | erosion | 0.61 | 0.42 | 0.50 | 0.33 |

| | | | | | |
|---|---|---|---|---|---|
| 3 | dilation | 0.48 | 0.81 | 0.60 | 0.43 |
| 3 | binary_opening + binary_closing | 0.56 | 0.63 | 0.59 | 0.42 |
| 3 | binary_opening + binary_erosion | 0.61 | 0.42 | 0.50 | 0.33 |
| 3 | binary_opening + binary_dilation | 0.50 | 0.78 | 0.61 | 0.44 |
| 3 | binary_closing + binary_opening | 0.56 | 0.63 | 0.59 | 0.42 |
| 3 | binary_closing + binary_erosion | 0.61 | 0.43 | 0.50 | 0.34 |
| 3 | binary_closing + binary_dilation | 0.48 | 0.81 | 0.60 | 0.43 |
| 3 | binary_erosion + binary_opening | 0.64 | 0.37 | 0.47 | 0.31 |
| 3 | binary_erosion + binary_closing | 0.61 | 0.42 | 0.50 | 0.33 |
| 3 | binary_erosion + binary_dilation | 0.57 | 0.62 | 0.59 | 0.42 |
| 3 | binary_dilation + binary_opening | 0.64 | 0.37 | 0.47 | 0.31 |
| 3 | binary_dilation + binary_closing | 0.61 | 0.42 | 0.50 | 0.33 |
| 3 | binary_dilation + binary_erosion | 0.57 | 0.62 | 0.59 | 0.42 |
| 3 | binary_opening + binary_closing + binary_dilation | 0.61 | 0.43 | 0.50 | 0.34 |
| 3 | binary_closing + binary_dilation + binary_erosion | 0.56 | 0.63 | 0.59 | 0.42 |
| 3 | binary_dilation + binary_erosion + binary_opening | 0.57 | 0.62 | 0.59 | 0.42 |
| 3 | binary_erosion + binary_opening + binary_closing | 0.48 | 0.81 | 0.60 | 0.43 |
| 3 | binary_opening + binary_closing + binary_erosion + binary_dilation | 0.56 | 0.63 | 0.59 | 0.42 |
| 3 | binary_closing + binary_erosion + binary_dilation + binary_opening | 0.56 | 0.63 | 0.59 | 0.42 |
| 3 | binary_erosion + binary_dilation + binary_opening + binary_closing | 0.56 | 0.63 | 0.59 | 0.42 |
| 3 | binary_dilation + binary_opening + binary_closing + binary_erosion | 0.55 | 0.65 | 0.60 | 0.43 |