# An Inverse Problem Approach for Automatically Adjusting the Parameters for Rendering Clouds Using Photographs (supplemental material)

## Parameters used to render synthetic clouds shown in the paper

| Figure | $c_{in}$ | | | $L_{in}$ | $g$ | $\sigma_t$ | $\beta$ | $L_{amb}$ | $\kappa_a$ | | | sun direction[*] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1(a) | 0.80 | 0.82 | 0.84 | 3.97 | 0.48 | 0.22 | 0.29 | 0.95 | 0.20 | 0.30 | 0.70 | 60.0 | 90.0 |
| 1(b) | 0.67 | 0.71 | 0.80 | 3.86 | 0.02 | 0.11 | 0.22 | 0.69 | 0.20 | 0.20 | 0.70 | 45.0 | 45.0 |
| 1(c) | 0.84 | 0.64 | 0.45 | 6.40 | 0.48 | 0.30 | 0.56 | 0.10 | 0.00 | 0.10 | 0.20 | 0.0 | 45.0 |
| 1(d) | 0.73 | 0.44 | 0.18 | 2.46 | 0.38 | 0.62 | 1.00 | 0.11 | 0.00 | 0.00 | 0.00 | 0.0 | 90.0 |
| 1(e) | 0.91 | 0.45 | 0.31 | 1.28 | 0.10 | 0.20 | 0.88 | 0.44 | 0.00 | 0.00 | 0.60 | 90.0 | 90.0 |
| 1(f) | 0.84 | 0.54 | 0.49 | 3.88 | 0.30 | 0.12 | 0.45 | 0.72 | 0.00 | 0.10 | 0.20 | 45.0 | 0.0 |
| 5(a) | 0.88 | 0.90 | 0.88 | 2.30 | 0.20 | 0.50 | 0.50 | 0.60 | 0.20 | 0.10 | 0.10 | 90.0 | 0.0 |
| 5(b) | 0.83 | 0.87 | 0.87 | 2.02 | 0.10 | 0.39 | 0.50 | 0.61 | 0.00 | 0.00 | 0.00 | 90.0 | 0.0 |
| 5(c) | 0.88 | 0.90 | 0.88 | 2.30 | 0.20 | 0.50 | 0.50 | 0.60 | 0.20 | 0.10 | 0.10 | 10.0 | 20.0 |
| 5(d) | 0.83 | 0.87 | 0.87 | 2.02 | 0.10 | 0.39 | 0.50 | 0.61 | 0.00 | 0.00 | 0.00 | 10.0 | 20.0 |
| 5(e) | 0.77 | 0.80 | 0.80 | 5.91 | 0.31 | 0.56 | 0.38 | 0.68 | 0.10 | 0.00 | 0.00 | 10.0 | 20.0 |
| 7(a) left | 0.83 | 0.87 | 0.87 | 1.41 | 0.14 | 0.56 | 0.62 | 0.62 | 0.00 | 0.00 | 0.00 | 90.0 | 0.0 |
| 7(a) right | 0.83 | 0.87 | 0.87 | 5.99 | 0.01 | 0.25 | 0.25 | 0.35 | 0.00 | 0.00 | 0.10 | 90.0 | 0.0 |
| 7(b) left | 0.83 | 0.87 | 0.87 | 3.03 | 0.24 | 0.50 | 0.47 | 0.62 | 0.00 | 0.00 | 0.00 | 90.0 | 0.0 |
| 7(b) right | 0.83 | 0.87 | 0.87 | 2.75 | 0.09 | 0.36 | 0.57 | 0.42 | 0.30 | 0.60 | 0.80 | 90.0 | 0.0 |
| 8(a) | 0.83 | 0.87 | 0.87 | 9.56 | 0.39 | 0.41 | 0.28 | 0.62 | 0.00 | 0.00 | 0.00 | 80.0 | 270.0 |
| 8(b) | 0.83 | 0.87 | 0.87 | 4.96 | 0.36 | 0.44 | 0.37 | 0.59 | 0.00 | 0.00 | 0.10 | 70.0 | 270.0 |
| 8(c) | 0.83 | 0.87 | 0.87 | 4.93 | 0.00 | 0.23 | 0.15 | 0.61 | 0.00 | 0.00 | 0.00 | 50.0 | 270.0 |
| 8(d) | 0.77 | 0.80 | 0.80 | 3.19 | 0.31 | 0.60 | 0.49 | 0.69 | 0.00 | 0.00 | 0.00 | 10.0 | 10.0 |
| 8(e) | 0.77 | 0.80 | 0.80 | 8.73 | 0.40 | 0.47 | 0.31 | 0.68 | 0.00 | 0.00 | 0.00 | 10.0 | 0.0 |
| 8(f) | 0.77 | 0.80 | 0.80 | 7.61 | 0.31 | 0.17 | 0.20 | 0.60 | 0.00 | 0.00 | 0.00 | 10.0 | 340.0 |
| 9(b) left | 0.80 | 0.82 | 0.84 | 2.69 | 0.54 | 0.29 | 0.38 | 0.94 | 0.10 | 0.10 | 0.10 | 60.0 | 90.0 |
| 9(b) right | 0.80 | 0.82 | 0.84 | 0.86 | 0.25 | 0.16 | 0.52 | 0.84 | 0.10 | 0.10 | 0.10 | 60.0 | 90.0 |
| 9(c) left | 0.80 | 0.82 | 0.84 | 4.46 | 0.59 | 0.34 | 0.38 | 0.96 | 0.28 | 0.28 | 0.28 | 60.0 | 90.0 |
| 9(c) right | 0.80 | 0.82 | 0.84 | 1.88 | 0.65 | 0.95 | 0.07 | 0.70 | 0.68 | 0.68 | 0.68 | 60.0 | 90.0 |
| 10(c) | 0.67 | 0.71 | 0.80 | 4.89 | 0.46 | 0.22 | 0.38 | 0.76 | 0.30 | 0.30 | 0.30 | 60.0 | 90.0 |
| 10(d) | 0.73 | 0.44 | 0.18 | 1.98 | 0.09 | 0.27 | 0.86 | 0.04 | 0.00 | 0.00 | 0.00 | 60.0 | 90.0 |
| 10(e) | 0.67 | 0.71 | 0.80 | 4.89 | 0.46 | 0.22 | 0.38 | 0.76 | 0.30 | 0.30 | 0.30 | 30.0 | 120.0 |
| 10(f) | 0.73 | 0.44 | 0.18 | 1.98 | 0.09 | 0.27 | 0.86 | 0.04 | 0.00 | 0.00 | 0.00 | 45.0 | 135.0 |
| 11(a) | 0.96 | 0.79 | 0.79 | 1.98 | 0.09 | 0.27 | 0.86 | 0.04 | 0.00 | 0.00 | 0.00 | 60.0 | 90.0 |
| 11(b) | 0.96 | 0.79 | 0.79 | 1.98 | 0.09 | 0.10 | 0.86 | 0.04 | 0.00 | 0.00 | 0.00 | 60.0 | 90.0 |
| 12(a) | 0.80 | 0.82 | 0.84 | 4.10 | 0.14 | 0.90 | 0.22 | 0.86 | 0.00 | 0.00 | 0.00 | 45.0 | 0.0 |
| 12(b) | 0.69 | 0.65 | 0.60 | 3.15 | 0.00 | 1.00 | 0.40 | 0.81 | 0.00 | 0.00 | 0.00 | -10.0 | 240.0 |
| 14 | 0.80 | 0.82 | 0.84 | 1.04 | 0.27 | 0.96 | 0.49 | 0.91 | 0.10 | 0.10 | 0.10 | 90.0 | 0.0 |

* The sun direction is indicated by using polar coordinates. The first and the second numbers indicate elevation and azimuth angles in degrees, respectively.