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CS355
Hw 8

1. $c_{diff} = (s \otimes m_{diff})(n \cdot l)$ $\quad n = [.58, .58, -.058]^T \quad L = [.53, .80, -.27]$

$(n \cdot l) = \begin{bmatrix} .58 \\ .58 \\ -.58 \end{bmatrix} [.53, .8, -.27] = .3074 + .464 + .1566 = \underline{.928}$

$s = .9 \begin{bmatrix} 1 \\ 1 \\ .8 \end{bmatrix} \quad m_{diff} = \begin{bmatrix} .1 \\ .2 \\ .5 \end{bmatrix} = (s \otimes m_{diff}) = .9 \begin{bmatrix} .1 \\ .2 \\ .4 \end{bmatrix} \cdot .928 = .835 \begin{bmatrix} .1 \\ .2 \\ .4 \end{bmatrix} = \begin{bmatrix} .0835 \\ .167 \\ .334 \end{bmatrix}$

2. $c_{spec} = (s \otimes m_{spec})(v \cdot r)^{m_{gls}} \quad m_{gls} = 4 \quad v = [0, 0, -1] \quad r = 2(l \cdot n)n - l$

$2 \cdot (.928)n - l$

$1.856n - l$

$1.856 \begin{bmatrix} .58 \\ .58 \\ -.58 \end{bmatrix} \begin{bmatrix} 1.076 \\ 1.076 \\ +1.076 \end{bmatrix} - \begin{bmatrix} .53 \\ .8 \\ -.27 \end{bmatrix} = \begin{bmatrix} .546 \\ .276 \\ -.806 \end{bmatrix} = r$

$v \cdot r = \begin{bmatrix} 0 \\ 0 \\ -1 \end{bmatrix} \begin{bmatrix} .546 \\ .276 \\ -.806 \end{bmatrix}^4 = (.806)^4 = \boxed{.422}$

$(s \otimes m_{spec}) \cdot .422 = \begin{bmatrix} 1 \\ 1 \\ .8 \end{bmatrix} \begin{bmatrix} .5 \\ .5 \\ .5 \end{bmatrix}^{.9} \cdot .422 = \begin{bmatrix} .45 \\ .45 \\ .36 \end{bmatrix} \cdot .422 = \begin{bmatrix} .1899 \\ .1899 \\ .1519 \end{bmatrix}$

3. $c_{amb} = s_{amb} \otimes m_{amb} \rightarrow$ [redacted] $\cdot \begin{bmatrix} 1 \\ 1 \\ .8 \end{bmatrix} \begin{bmatrix} .1 \\ .2 \\ .5 \end{bmatrix}^{.1} = .1 \begin{bmatrix} .1 \\ .2 \\ .4 \end{bmatrix} = \begin{bmatrix} .01 \\ .02 \\ .04 \end{bmatrix}$

4. [redacted] $c_{spec} + c_{diff} + c_{amb} = L_{it}$

$\begin{bmatrix} .1899 \\ .1899 \\ .1519 \end{bmatrix} + \begin{bmatrix} .0835 \\ .167 \\ .334 \end{bmatrix} + \begin{bmatrix} .01 \\ .02 \\ .04 \end{bmatrix} = \begin{bmatrix} .2834 \\ .3769 \\ .5259 \end{bmatrix}$