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Assessment of the Monte Carlo ray-tracing acceleration with OpenCL

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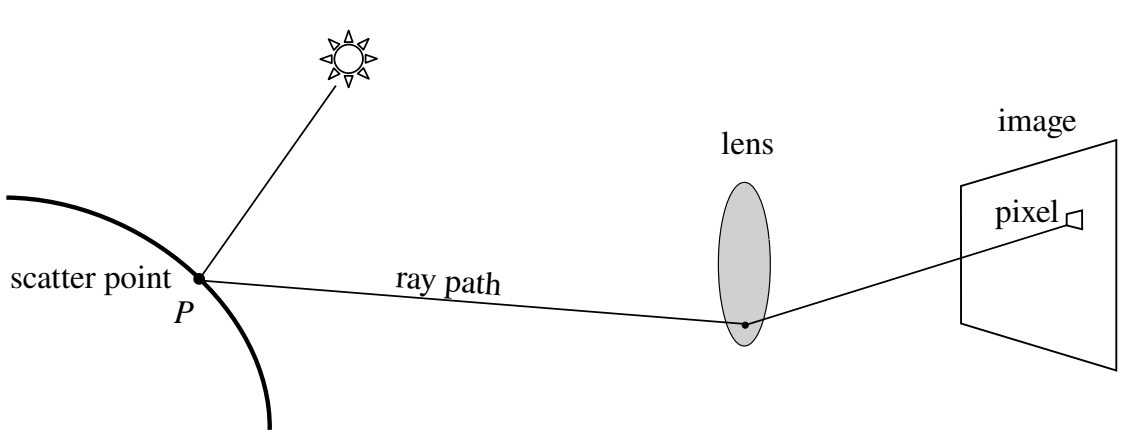
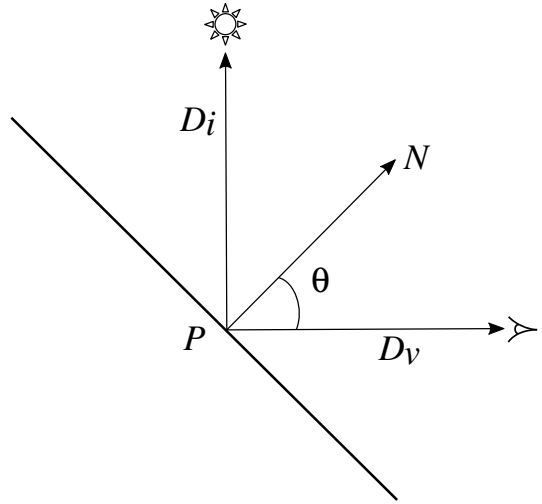
Problem description





$$L(P \rightarrow D_v) = L_e(P \rightarrow D_v) + \int_{\Omega} F_s(D_v, D_i) \cdot |\cos(\theta)| \cdot L(Y_i \rightarrow -D_i)\, dD_i$$

$$\hat{L}(P \rightarrow D_v) = L_e(P \rightarrow D_v) + \frac{F_s(D_v, D_i) \cdot |\cos(\theta)| \cdot \hat{L}(Y_i \rightarrow -D_i)}{p^{tot}_{angle}(D_i)}$$

- Experiments setup
  - Hardware
    - cluster for accelerated computations at Cyfronet, 128 GB RAM
      - NVIDIA Tesla, 13 compute units
      - Intel Xeon E5, 32 compute units
    - Intel GPU 630, 23 compute units
  - software
    - CentoOS 7
    - OpenCL 1.2
    - Gcc 4.8.5