# Integrator Validation

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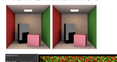
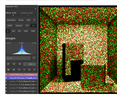
## 1. Direct Integrator

### 1.1. Direct integrator validation

- Compare direct integrator with Mitsuba path tracer (max depth = 2)

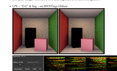


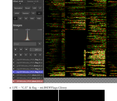


### 1.2. Ping validation: Direct integrator with LPE

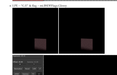
- Compare image filtered by LPE and by Beauty in direct integrator

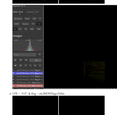
LPE : "D.0" & beauty : rgb(255/255/255/255)



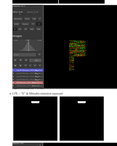


LPE : "L.0" & beauty : rgb(255/255/255/255)

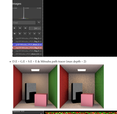




LPE : "S" & beauty : rgb(255/255/255/255)



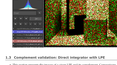
LPE : LE : LD : S & Mitsuba path tracer (max depth : 2)

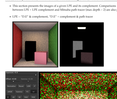


### 1.3. Complement validation: Direct integrator with LPE

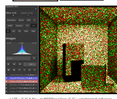
- Compare image filtered by LPE and by Beauty minus filtered by LPE in direct integrator
- Mitsuba LPE : LPE complement and Mitsuba path tracer (max depth : 2) are also provide

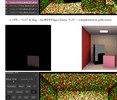
LPE : "D.0" & complement : "D.0" : complement & path tracer



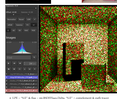


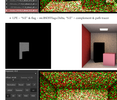
LPE : "L.0" & beauty : rgb(255/255/255/255) "L.0" : complement & path tracer



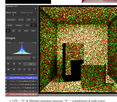


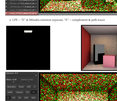
LPE : "S" & beauty : rgb(255/255/255/255) "S" : complement & path tracer





LPE : "D" & Mitsuba path tracer (max depth : 2) : complement & path tracer

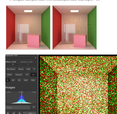




## 2. Mata Path tracer

### 2.1. Mata Path tracer validation

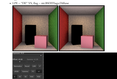
- Compare mata path tracer with Mitsuba path tracer (max depth : 2)



### 2.2. Ping validation: Mata Path tracer with LPE(max depth = 2)

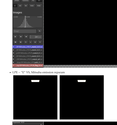
- Compare image filtered by LPE and by Beauty minus filtered in direct integrator, max depth = 2

LPE : "D.0" & beauty : rgb(255/255/255/255)

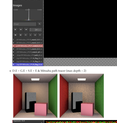


LPE : "L.0" & beauty : rgb(255/255/255/255)

LPE : "S" & beauty : rgb(255/255/255/255)



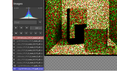
LPE : LE : LD : S & Mitsuba path tracer (max depth : 2)

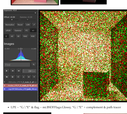


### 2.3. Complement validation: Mata Path tracer with LPE(max depth = 2)

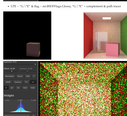
- This section presents the images of a given LPE and its complement. Comparisons between LPE : LPE complement and Mitsuba path tracer (max depth : 2) are also provide.

LPE : "D.0" & complement: "D.0" : complement & path tracer

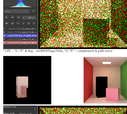




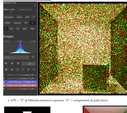

- LPE : "L[^D]*E" & flag : --mediaMIS(type=Linear, "L[^D]*" = complement & path tracer)




- LPE : "L[^D]*E" & flag : --mediaMIS(type=Linear, "L[^D]*" = complement & path tracer)

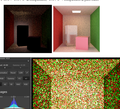



- LPE : "E" & Schmidt-criterion exponent: "E" = complement & path tracer



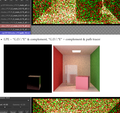

### 2.4 - Complex complement validation: Mixte Path tracer with LPE (max depth = 10)

- This section presents the images of relatively complex LPE and its complement.
- Comparison between LPE : LPE complement and Mitsuba path tracer (max depth = 10) are also provided.
- LPE : "D(s|[^S])*[^S]E" & complement : "L(s|[^S])*" = complement & path tracer



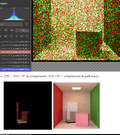



- LPE : "L(s|[^S])*" & complement : "L[^D]*E" = complement & path tracer






- LPE : "L[^D]*E" & complement : "L(s|[^S])*" = complement & path tracer



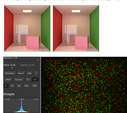



- LPE : "L[^D]*E" & complement : "L(s|[^S])*" = complement & path tracer

## 3 - MIS Path tracer

### 3.1 - MIS Path tracer with per lobe NEE validation

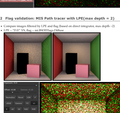
- Comparison path tracer(per lobe NEE) with Mitsuba path tracer (max depth = 10)





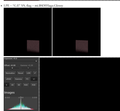

### 3.2 -Ring validation: MIS Path tracer with LPE(max depth = 2)

- Comparison images illustrating LPE and flag Emission-Direct integrator, (max depth = 2)
- LPE : "L[^D]*E" & flag : --mediaMIS(type=Ring)



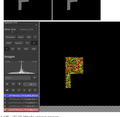



- LPE : "L[^D]*E" & flag : --mediaMIS(type=Ring)



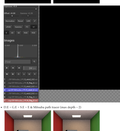



- LPE : "L[^D]*E" & flag : --mediaMIS(type=Ring)






- LPE : "L[^D]*E" & Mitsuba-criterion exponent

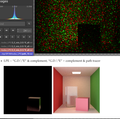





- LPE : (L[^D]*E | E) & Mitsuba path tracer (max depth = 2)

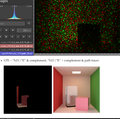
### 3.3 - Complex complement validation: Mix Path tracer with LPE(max depth = 10)

- This section presents the images of relatively complex LPE and its complement.
- Comparison between LPE : LPE complement and Mitsuba path tracer (max depth = 10) are also provided.
- LPE : "D(s|[^S])*[^S]E" & complement : "L(s|[^S])*" = complement & path tracer



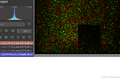



- LPE : "L(s|[^S])*" & complement : "L[^D]*E" = complement & path tracer






- LPE : "L[^D]*E" & complement : "L(s|[^S])*" = complement & path tracer



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