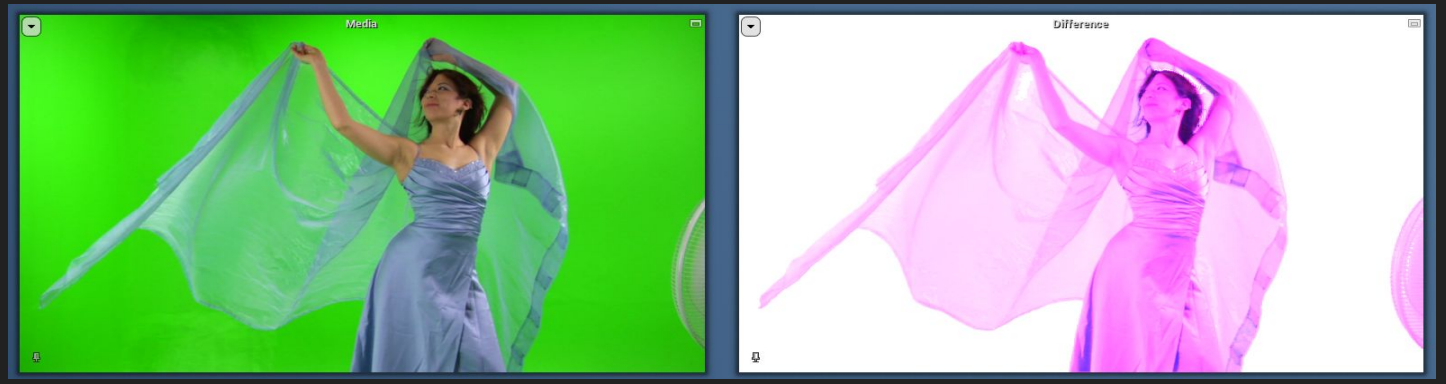
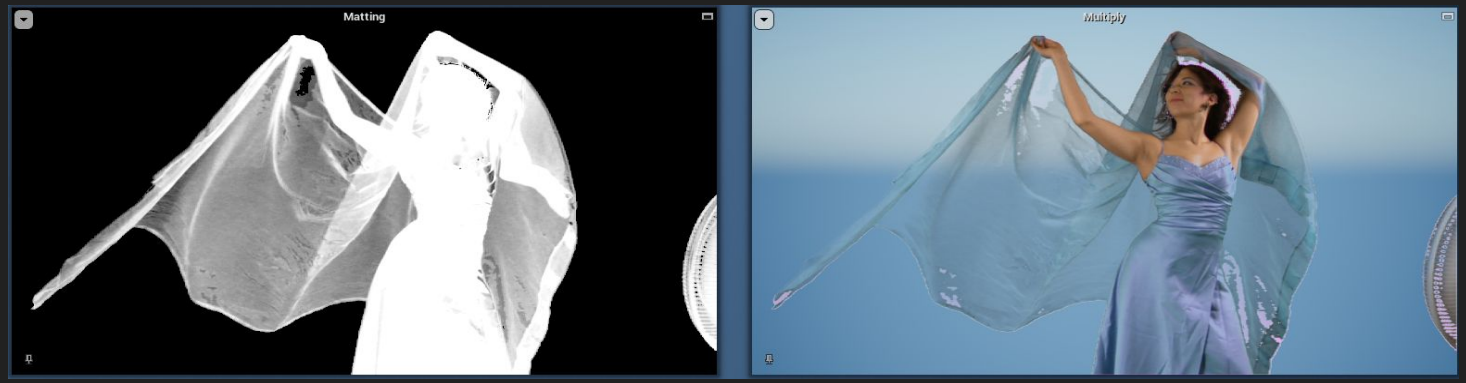
Composure X

Realtime Compositing Workflow

@dpredie

Building real-time compositing tools?





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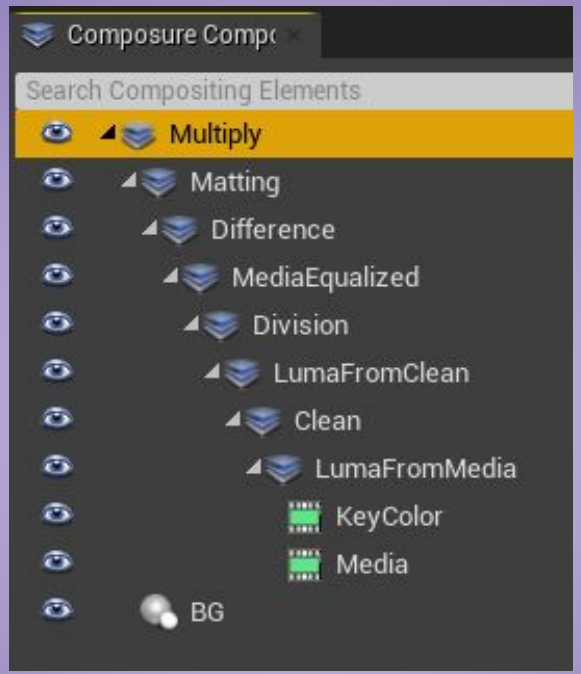
Layers or Passes?



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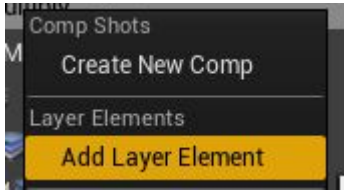
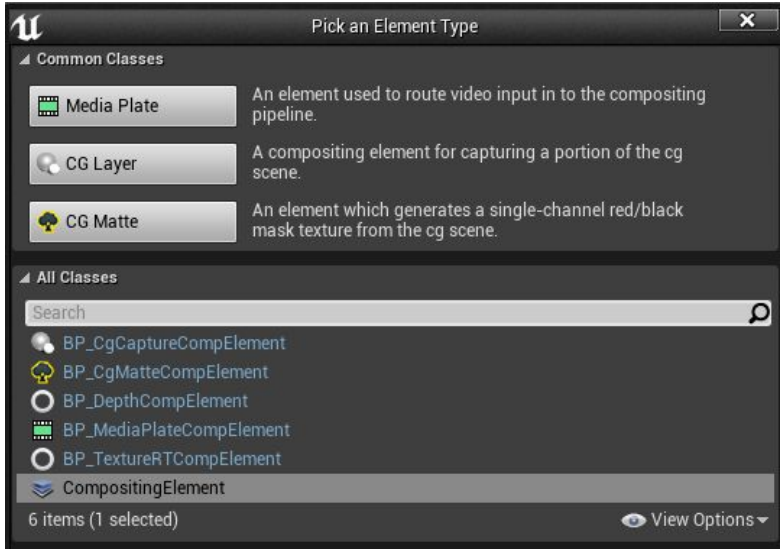
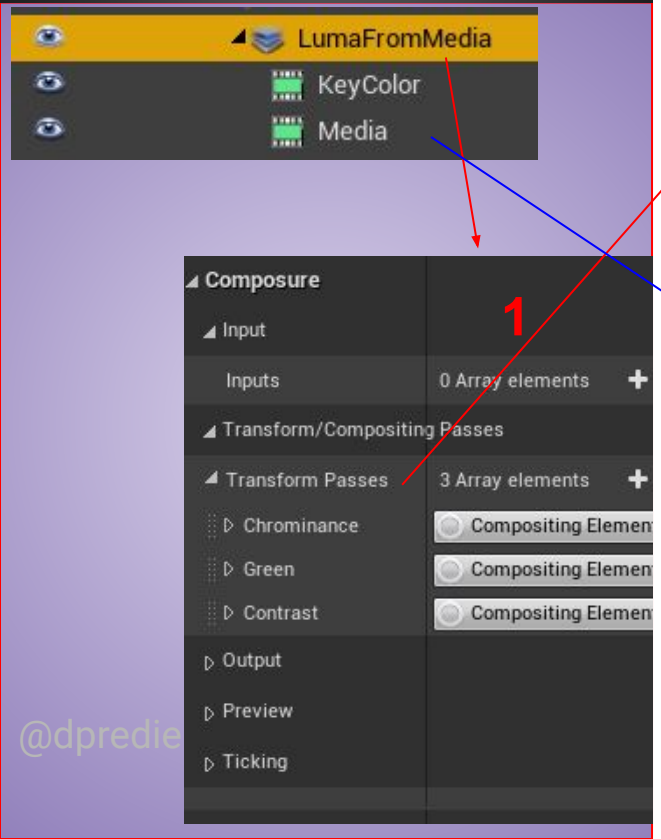
Layers:

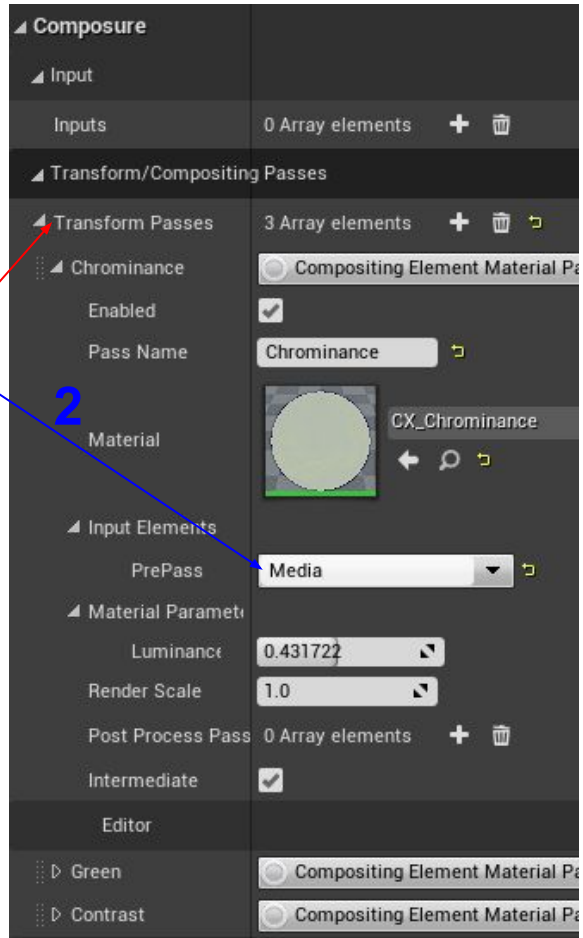




Layers or Passes?

Passes:

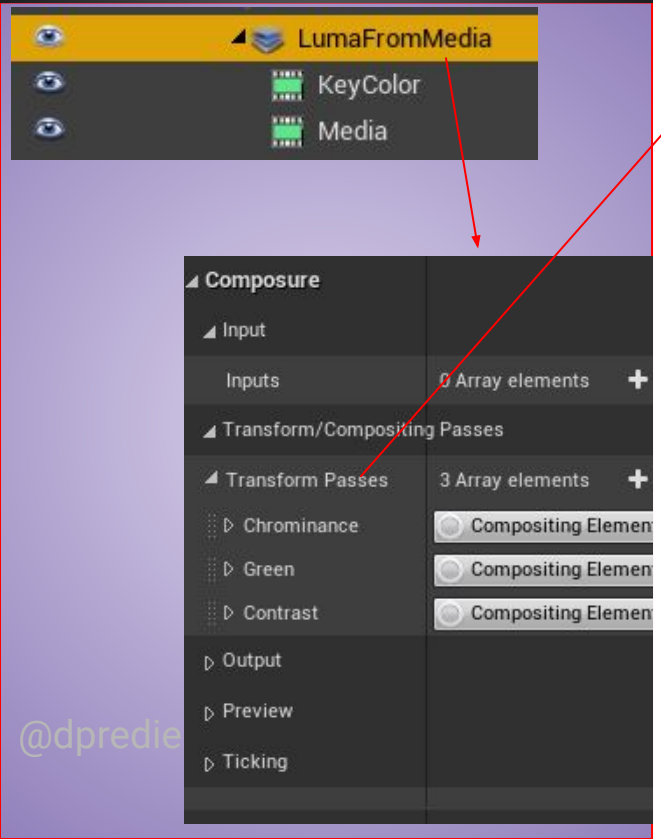




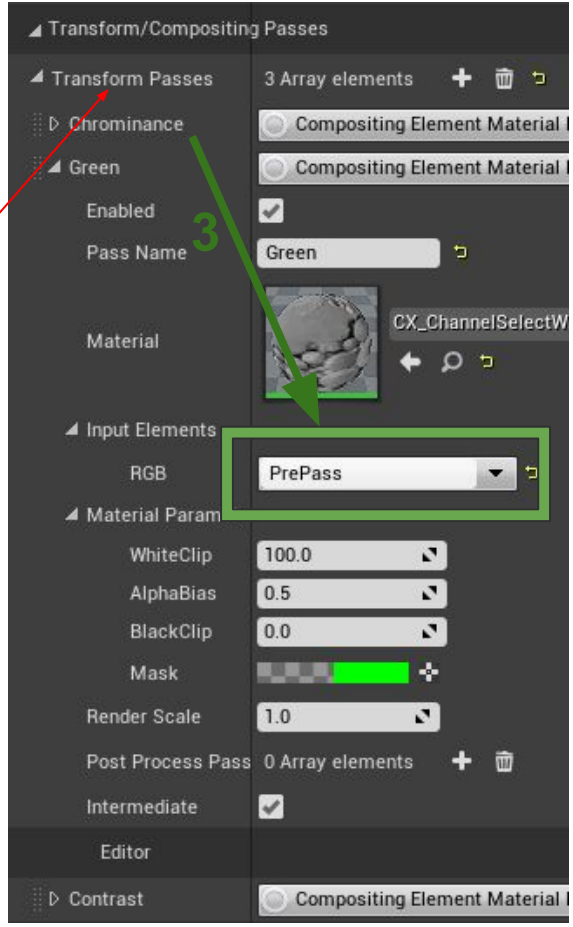
1. **Each Layer can have multiple passes**

2. **Each Pass can access result of any child Layers (but not passes inside it)**

Layers or Passes?

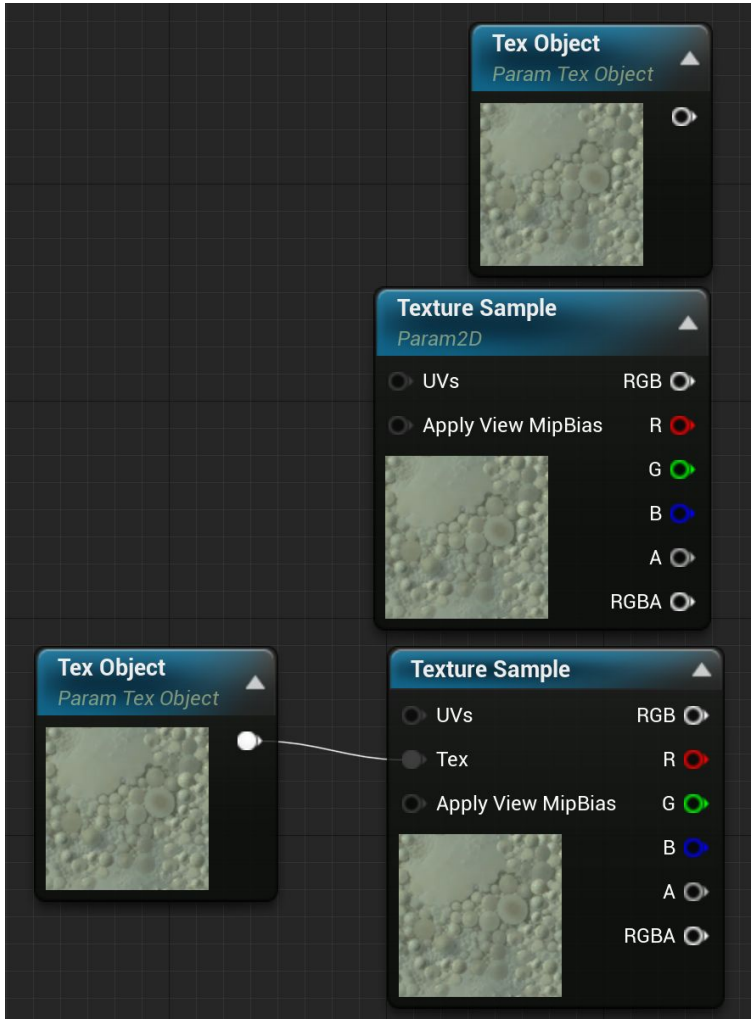


Passes:



1. **Each Layer can have multiple passes**
2. **Each Pass can access result of any child Layers (but not passes inside it)**
3. **Each Pass can access result of 1 pass preceding it**

Why Build Multi Layers?



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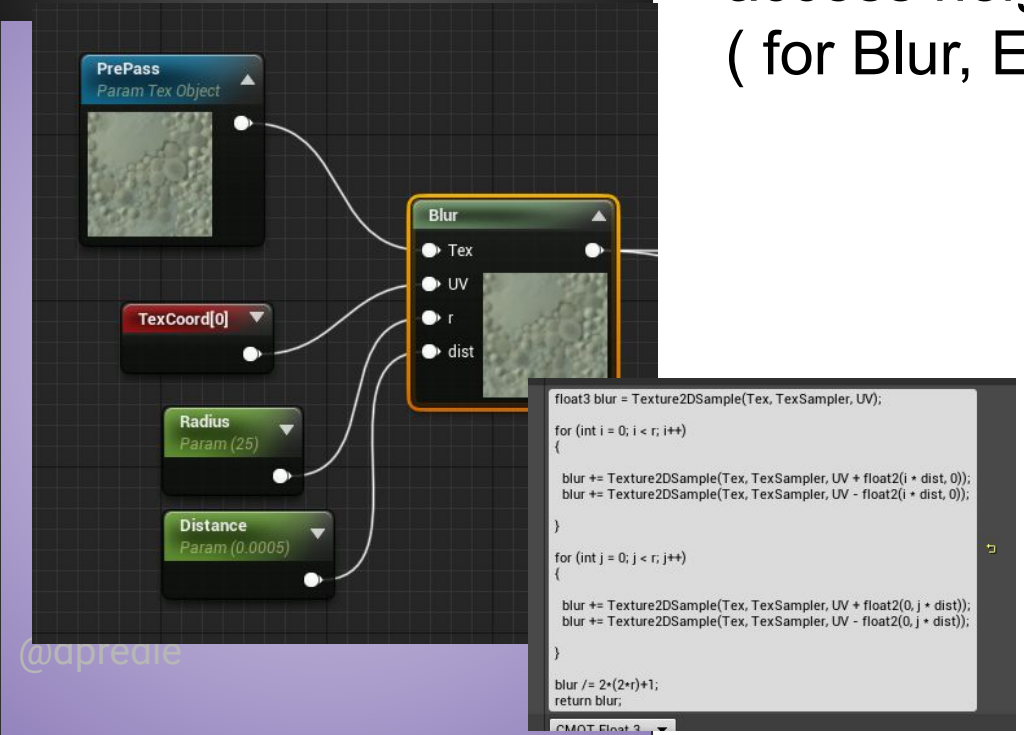
Why Build Multi Layers?

Tex Object

With Tex Object Parameter you can access neighboring pixel for manipulation (for Blur, Erode, etc).

result of these mathematical nodes are Texture Sample, so you cannot perform multiple Tex Object manipulation in 1 Material BP



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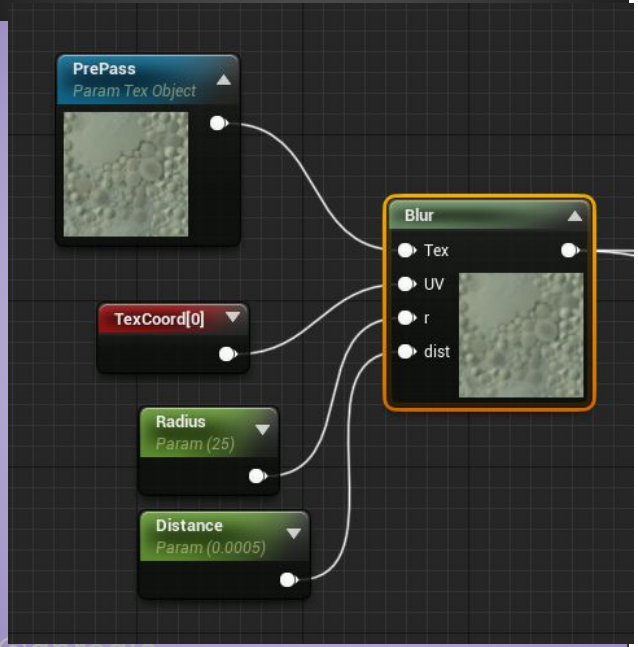
Why Build Multi Layers?



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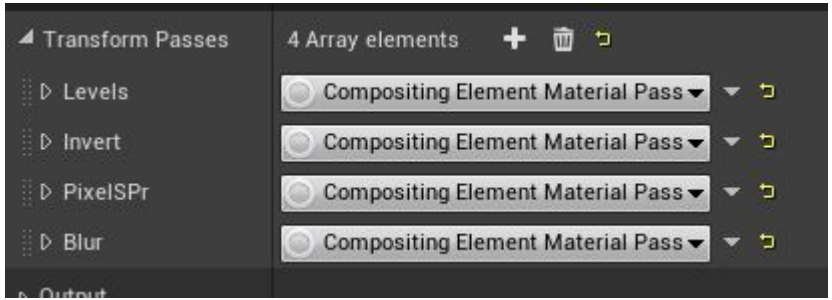
Tex Object

For compositing workflow you need to do multiple manipulation passes (preblur → Erode → blur, etc), which is not possible within single BP

as each Layer/Pass will output another Tex Object available for the next Layer/Pass to manipulate



Why Build Multi Layers?

Tex Object

… and so on

Why Build Multi Layers?

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Concerns on Performance

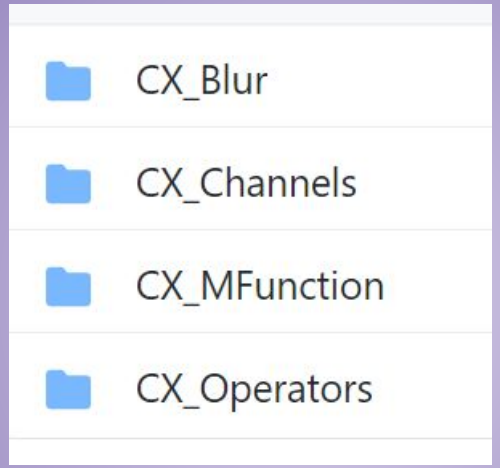
This workflow is best for **prototyping** the keyer/compositor

you have instant feedback on the layers and can go back to enable/disable each layer/passes

Once finalized, *you can build the compositor in fewer materials to optimize performance* (fewer renders to Tex Obj)

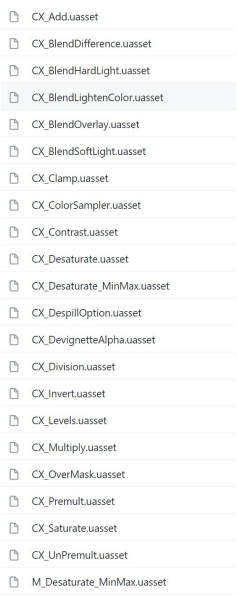
Compositing in Composure

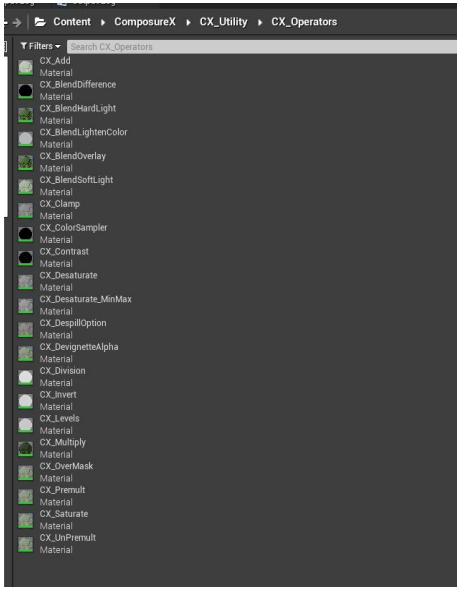
CX - Workflow



https://github.com/dpredie/ComposureX

Copy Paste Content/ComposureX folder to Windows Explorer UE Project Content/

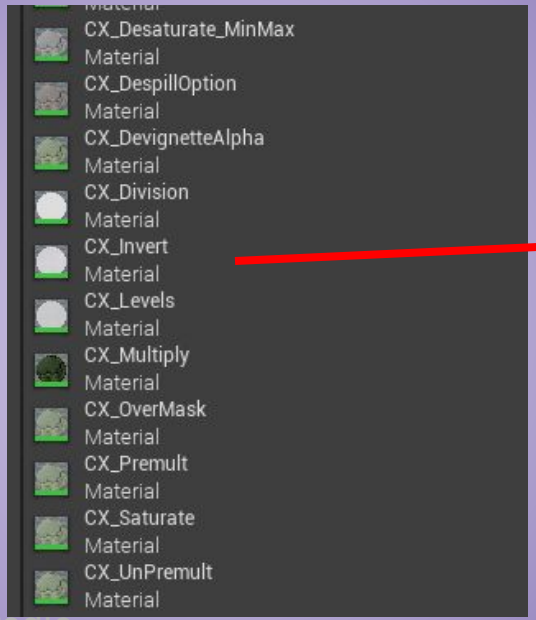


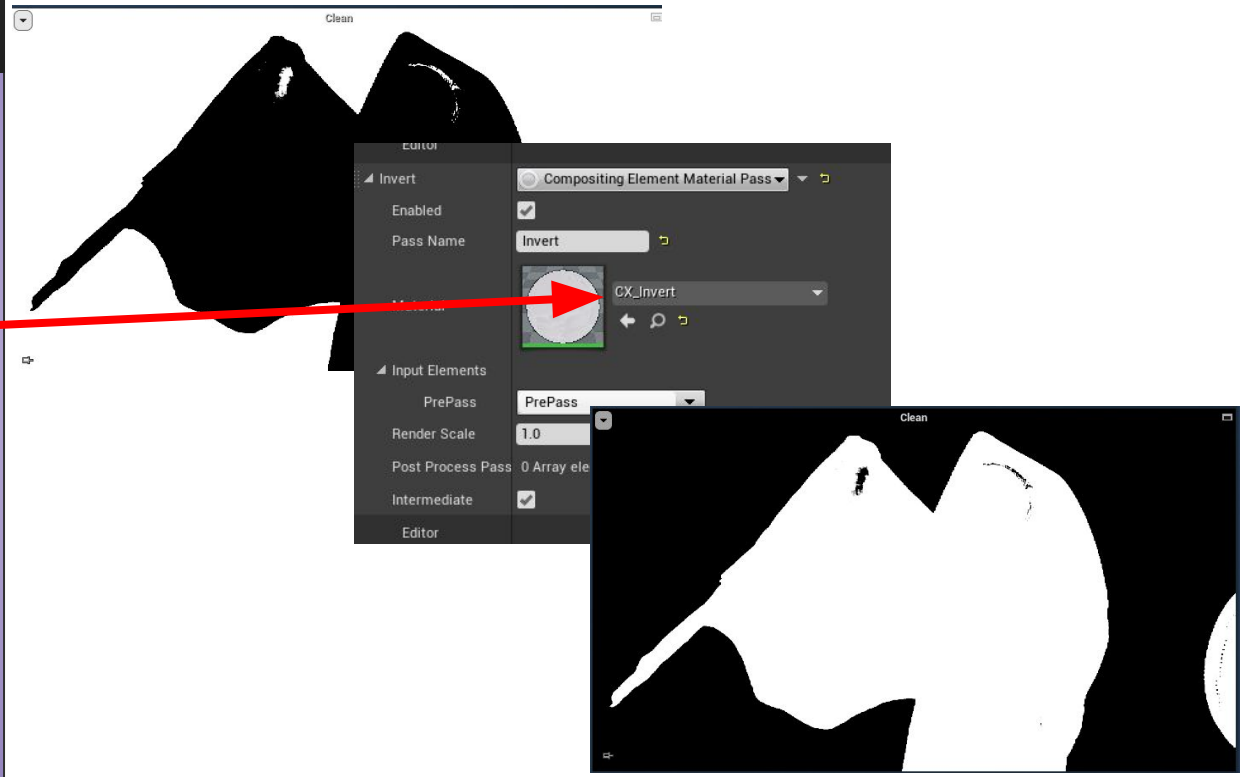


Compositing in Composure

CX - Utilities

Each CX Utilities can be used in Composure Layers/Passes as Materials similar to offline compositor nodes





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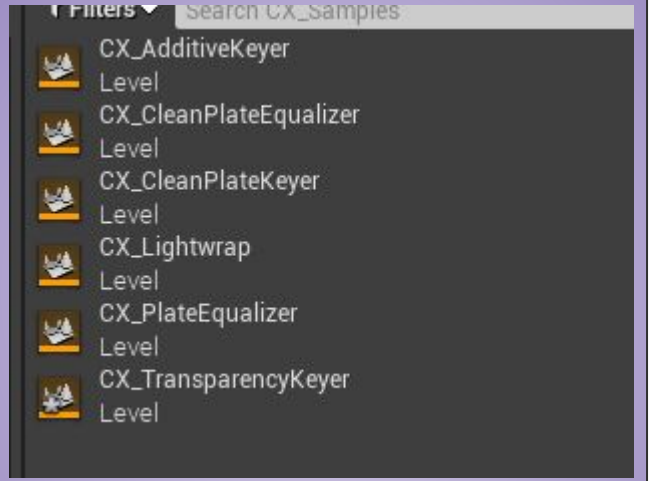
Compositing in Composure

CX - Samples



Included Samples:

1. Additive Keyer
2. Screen Equalizers
   a. Clean Plate Equalizer (if Clean Plate image is provided)
   b. Plate Equalizer (Clean Plate estimated)
3. Clean Plate Keyer
4. Transparency Keyer (based on 2.b)
5. Lightwrap

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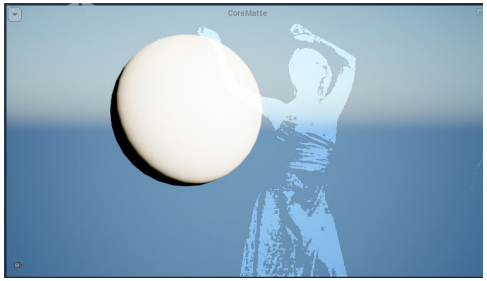
Compositing in Composure

CX - Additive Keyer

Keying without Alpha Channel, also known as Straight Dry Key/Despill Based Keyer



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Compositing in Composure

CX - Clean Plate Equalizer

1. Provide Clean Plate Image & Equalize uneven background (Luma Based)

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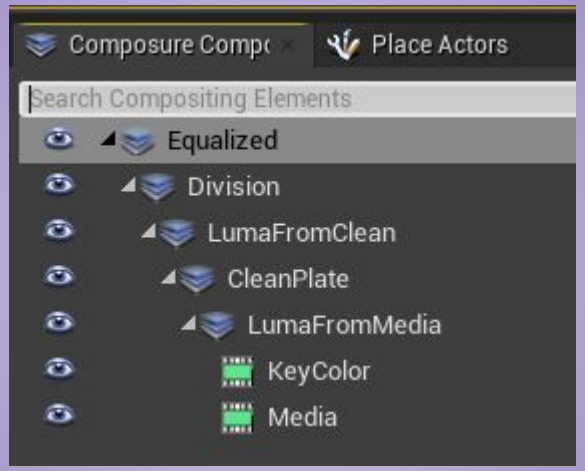
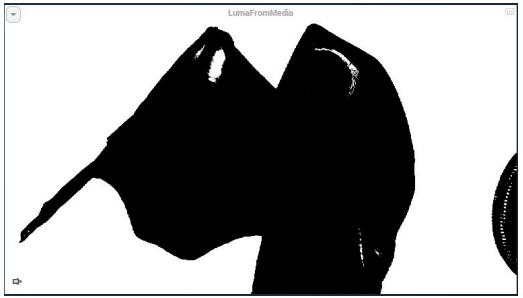
Compositing in Composure

CX - Plate Equalizer

2. Estimate Clean Plate Image & Equalize uneven background (Luma Based)





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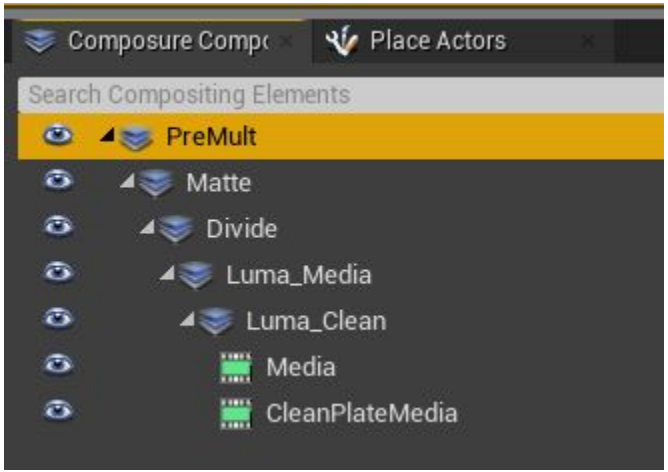
Compositing in Composure

CX - Clean Plate Keyer

Luma difference between provided Clean Plate & Media



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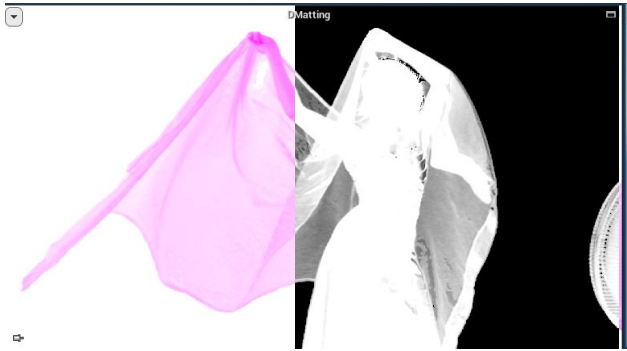
Compositing in Composure

CX - Transparency Keyer

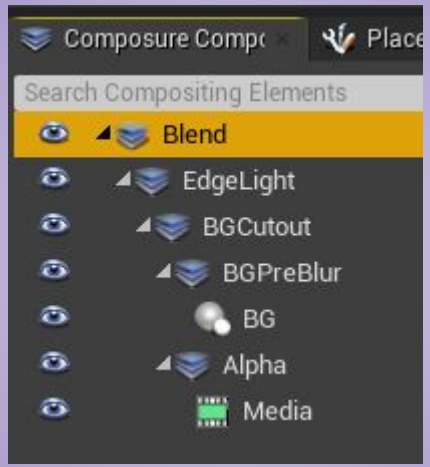
Difference Based Keyer using 2.b. Equalized Plate

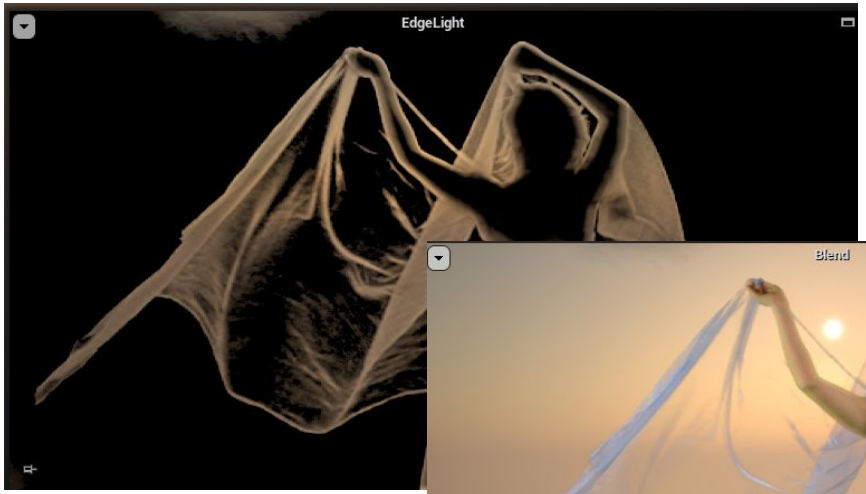


Compositing in Composure

CX - Lightwrap

Modular implementation using CX - using epic's M_SinglePasscolorDiffKeyer, but any previous keyer that generate alpha can be used





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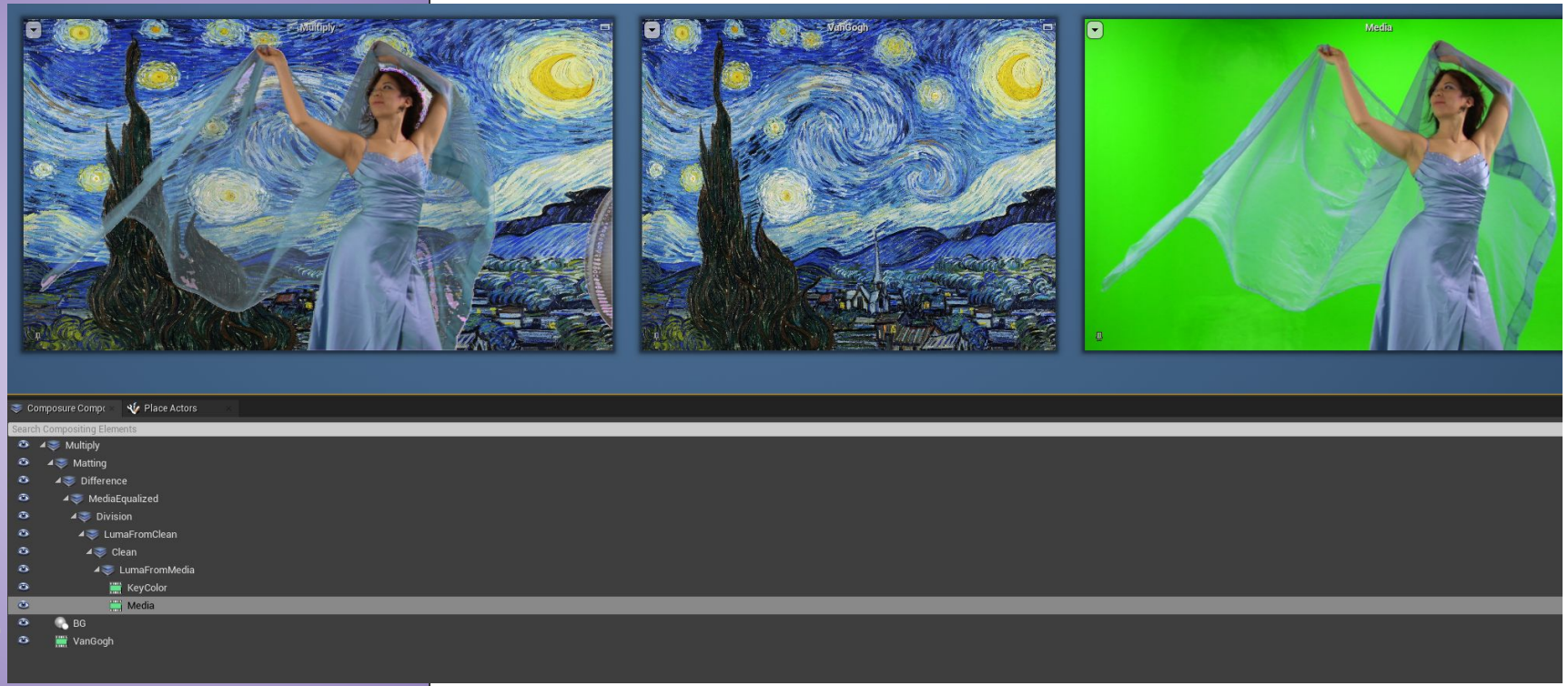
What's Possible

UE can become a real-time software keyer - not necessarily using UE Environments. Any Camera/Video/Image feed can be fed to Composure layers



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Credits

- Johan Folke for general Lightwrap algorithm
- MihranStepanyan for Plate Equalizer algorithm
  - https://www.youtube.com/c/MihranStepanyan/videos
- Clement Gharini for Straight Dry Key algorithm
  - https://www.youtube.com/watch?v=FRNFfPN8WjI