

BRINGING REALITY TO VIRTUAL WORLDS

Virtual and Augmented Reality ask for images that provide content as close as possible to realistic impression. Additionally users should have the freedom to move with six degrees of freedom (DoF) without being restricted to one or two fixed positions where the content looks right and well adapted. That will exceed the limitations of using only computer generated content for VR/AR experiences.

These two challenges can be solved by using light-field technology. Light-field content processed by Realception® has the potential to simplify, accelerate and extend CGI post-production workflows and provide photorealistic images out of real-world recordings.

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PHOTOREALISTIC RENDERING BY LIGHT-FIELD TECHNOLOGIES



WHAT DOES LIGHT-FIELD MEAN?

Light-field technology is based on multi-camera recordings and allows for the generation of virtual views of a scene. The generation of the virtual views is bounded by the size of the camera array that is used and the light rays captured by the cameras. It is comparable to a "look outside of a window", where the spectator moves around or turns his head, and where the different viewpoints for him are as perfectly adapted as possible to his regular/usual perception. These experiences can be rebuilt by using light-field technology. It recalculates all the light rays or perspectives and enables the capacity to integrate as much different viewpoints as possible for a later processing in a post-production workflow.

Light-field processing of objects and scenes based on real-world captured content is a smart way to create spatial information and to enhance, simplify and accelerate processing steps together with CGI. It allows for different photorealistic representations of objects and scenes. The denser the camera array records pixel by pixel the corresponding scene, the more detailed and smoother is the look of the processed object.

WHAT ARE THE BIG BENEFITS FOR YOUR WORKFLOW?



REALCEPTION® – TOOLS THAT MAKE LIGHT-FIELD PRODUCTION WORTH FOR YOUR WORKFLOW

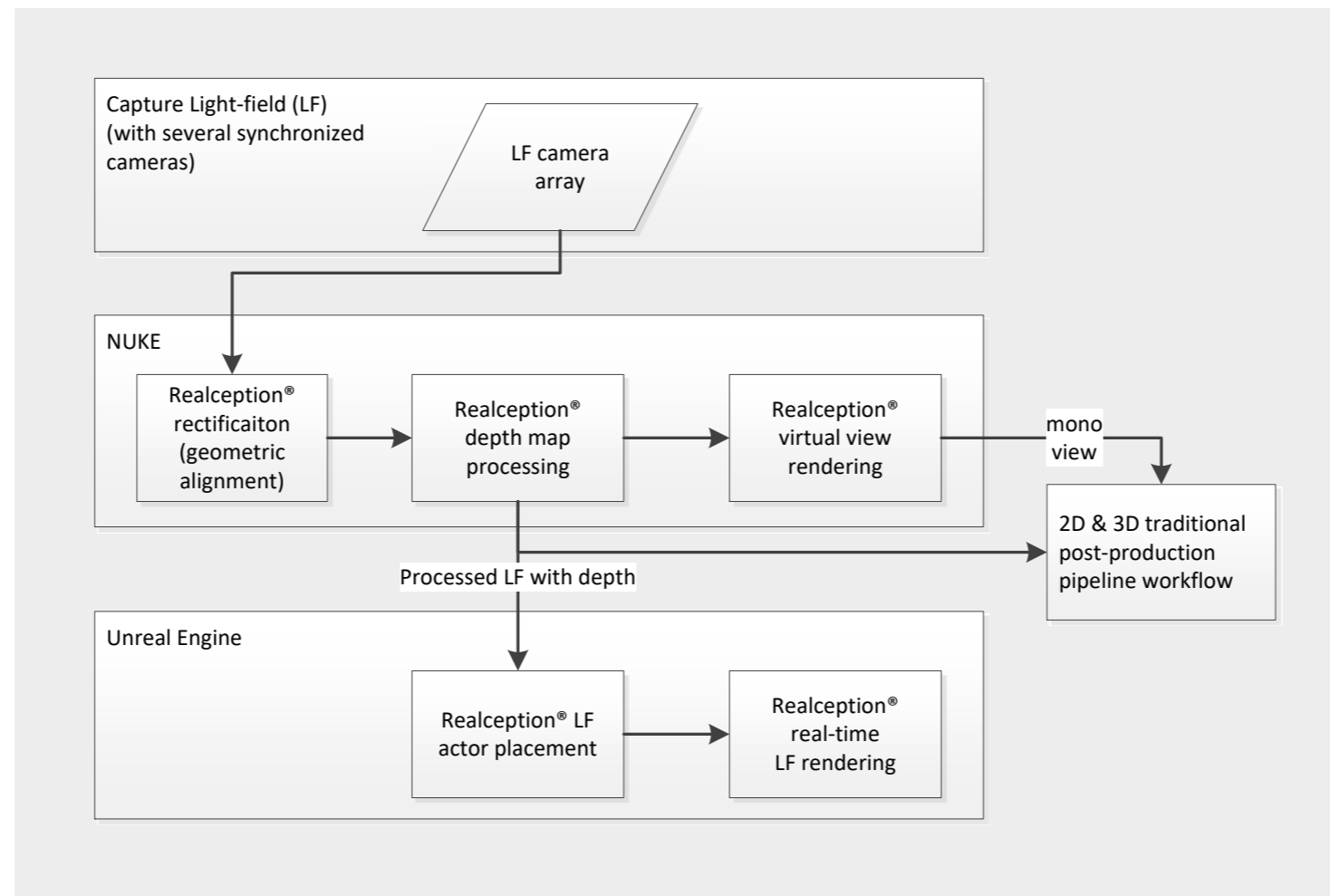
- Mixing real content with CGI scenarios to create photo-realistic images
- Suited to provide 6 DoF for augmented and virtual reality applications because of the multiple views that can be rendered for an immersive look
- A smooth, fast and easy integration into existing workflow pipelines
- Enhances workflows, reduces CGI works
- Enables easy adoption and re-use of scenes by extracting and using geometric information
- Using the parallax of scenes for calculating stereoscopic views

In order to work with multi-camera recordings Fraunhofer IIS has developed a set of tools for post-production under the brand name Realception® to use it in workflows for the production of VR/AR content.

Realception® tools work for production, rectification, disparity calculation, compositing and rendering for multi-camera scenes.

1 Realception® – Depth map generation in NUKE

2 Realception® – Photorealistic image rendered in game engine



Realception® Plug-ins

- Realception® for Foundry's Nuke provides several scripts and nodes that enable the creation of disparity maps from multi-camera footage. These disparity maps can be used in compositing to simplify grading or more advanced effects like virtual camera movements or synthetic defocus.
- Realception® for Unreal Engine allows for real-time rendering of light-fields in VR experiences for a seamless composition of CGI and live-action footage.

Once, a recording is finished Realception®

- takes over the rectifying process of the different camera views,
- calculates the disparity of the scene,
- provides different processing possibilities for compositing. e. g. relighting of scenes
- and renders multi-camera scenes for a preview or the final version.

Get more information at
www.iis.fraunhofer.de/realception