CHROMA KEY COMPOSITING WITH FPGA

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Outline of Topics

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Chroma key compositing

- Chroma key compositing, or chroma keying, is a special effects technique for compositing two images or video streams together based on color range.
- A color range in the foreground footage is made transparent, allowing separately filmed background footage or a static image to be inserted into the scene.
- This technique has been used heavily in many fields to remove a background from the subject of a photo or video particularly the newscasting, motion picture and videogame industries

Introduction

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History

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- In early filmmaking, a complex and time consuming process known as 'travelling matte'.
- **Travelling Matte** - A process that was used to superimpose backdrops with actors performing against a blank wall.
- In the 1930's, the chroma key compositing method was developed at RKO Radio pictures to make more effective films

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Travelling Matte

Building a Chroma Key Compositing system with FPGA

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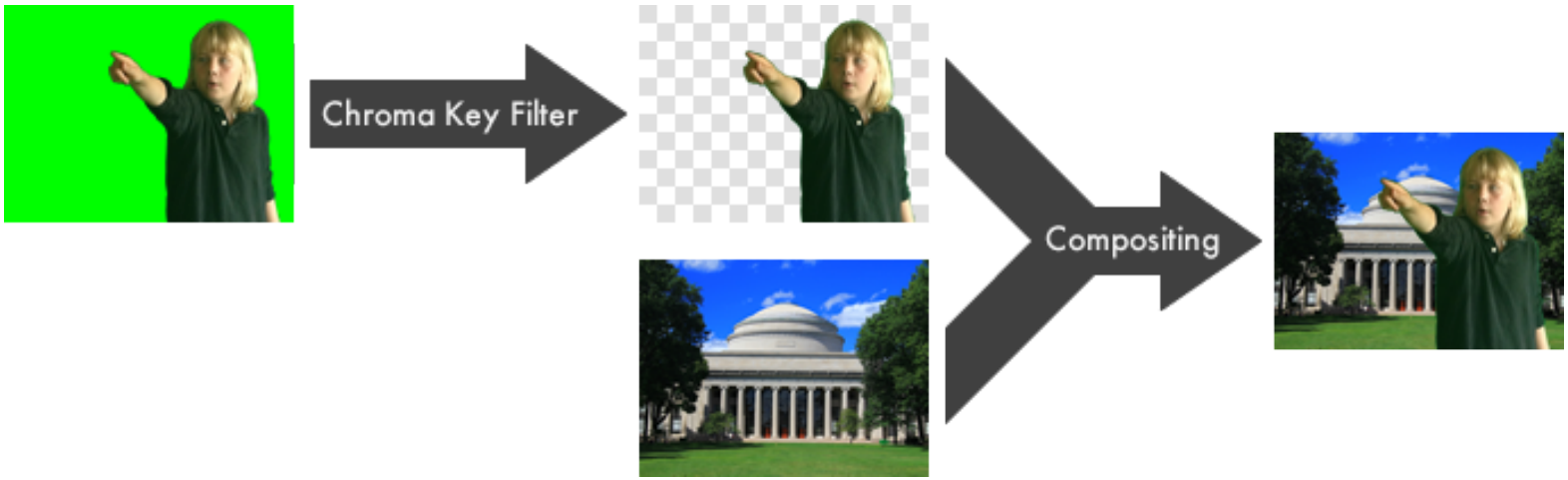
- Use one NTSC camera to capture the video feed of a Chroma key background with obstructions in the foreground. The second NTSC camera will capture another video feed that will replace the Chroma key.
- Store the video feeds in a DDR ram use an FPGA module to choose to control video overlaying.
- The module replace a pixel in the first video feed with a corresponding pixel from the second feed when the Chroma key of this pixel is within the selected Chroma key range.
- The final product will have two video feeds composited correctly and streamed to a VGA monitor in real time,
- If we successfully composite two video feeds, we would like to implement a module for morphological processing


Chroma Key Filter
Compositing

Advantages

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- It gives the illusion of the person being somewhere else.
- Chroma keying reduces the complexity in film making
- Minimum production cost as campared to Travelling Matte.

Disadvatages

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- Difficulties emerge with blue or green screen when a costume in an effects shot must be of the same color.
- Underexposing or overexposing a colored backdrop can lead to poor saturation level

Application

- Use for Weather forecast broadcasts.

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Application

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- Use in the entertainment industry

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Chroma Key Compositing with FPGA which eliminates an intermediary step between recording and video production to offer real time composited video stream. Chroma Key Compositing using the FPGA: Eliminates the need for post-processing.

Reference

- 1.R.G. (Dick) Baldwin "Using Chroma Key Compositing to Create Transparent Backgrounds" IEEE International paper on, pp 456-489, may 2007
- 2.Daniel H. Moon"Chroma Key Compositing with FPGA" 6.111 Final Project November 6, 2014
- 3. Shiaeru Shirnoda, et al. (1989), New Chroma-key Imaging Technique with Hi-Vision Background, IEEE Transactions on broadcasting, 35(4), pp. 357-361.

Thank You...