

Attenuation-based Light Field Displays

Bachelorarbeit

der Philosophisch-naturwissenschaftlichen Fakultät
der Universität Bern

vorgelegt von

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Abstract

Abstract goes here

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Chapter 1

Introduction

1.1 Related Work

Chapter 2

Capturing a Light Field

2.1 The Light Field and It's Properties

The plenoptic function, as introduced by [AB91], is a 7D function that describes the intensity of light for every frequency, along every light ray in space, at any time. It is defined as

$$P: \mathbb{R}^3 \times [0, 2\pi) \times [0, \pi] \times \mathbb{R}^2 \rightarrow \mathbb{R}^+ \\ (x, y, z, \theta, \phi, t, \lambda) \mapsto P(x, y, z, \theta, \phi, t, \lambda),$$

where the parameters (x, y, z) are the coordinates of a point in 3D space and the angles (θ, ϕ) describe the direction of an incoming light ray at time t . The light's intensity is given for every wavelength λ and thus, the plenoptic function not only captures the visible frequency spectrum but all electromagnetic waves. A commonly used measure for light is the radiance, which is obtained from P by integrating over all wavelengths: $R(x, y, z, \theta, \phi, t) = \int_{\mathbb{R}} P(x, y, z, \theta, \phi, t, \lambda) d\lambda$.

In practice, it is impossible to acquire all the data needed to model the 7D plenoptic function and hence it is reasonable to consider only a subset of the parameters. Dropping the time parameter t in $R(x, y, z, \theta, \phi, t)$ yields a 5D function for the radiance in a static scene. As described by [LH96], this five dimensional representation can further be reduced to four dimensions.

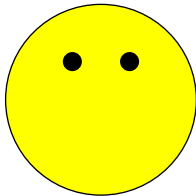


Figure 2.1

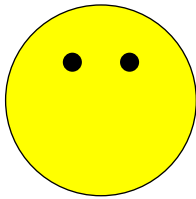


Figure 2.2

Appendix A

ap1

A.1 apsec1

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Erklärung

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