

ATTENUATION-BASED LIGHT FIELD DISPLAYS

Bachelor Thesis

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OUTLINE

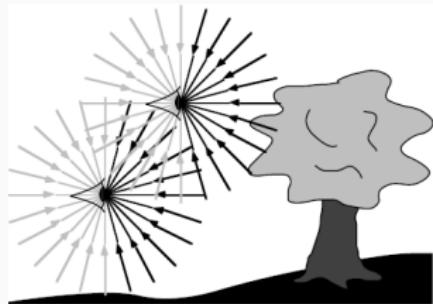
1. Motivation
2. Introduction to Light Fields
3. Problem Statement
4. Solution
5. Assessment
6. Conclusion

MOTIVATION

INTRODUCTION TO LIGHT FIELDS

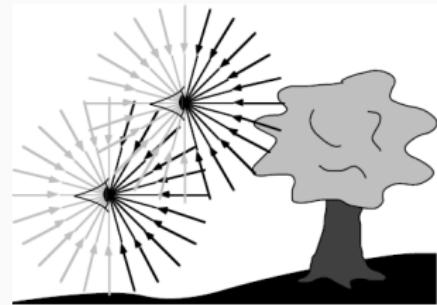
THE PLENOPTIC FUNCTION

- Measures light in the world



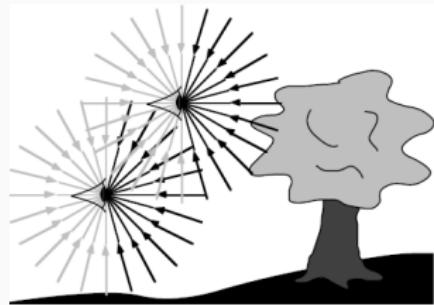
THE PLENOPTIC FUNCTION

- Measures light in the world
- $P(x, y, z, \theta, \phi, t, \lambda)$



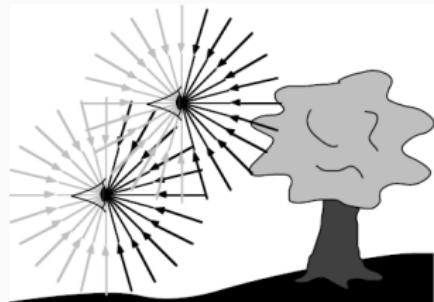
THE PLENOPTIC FUNCTION

- Measures light in the world
- $P(x, y, z, \theta, \phi, t, \lambda)$
- Position and viewing direction



THE PLENOPTIC FUNCTION

- Measures light in the world
- $P(x, y, z, \theta, \phi, t, \lambda)$
- Position and viewing direction
- Time, Wavelength



THE 4D LIGHT FIELD

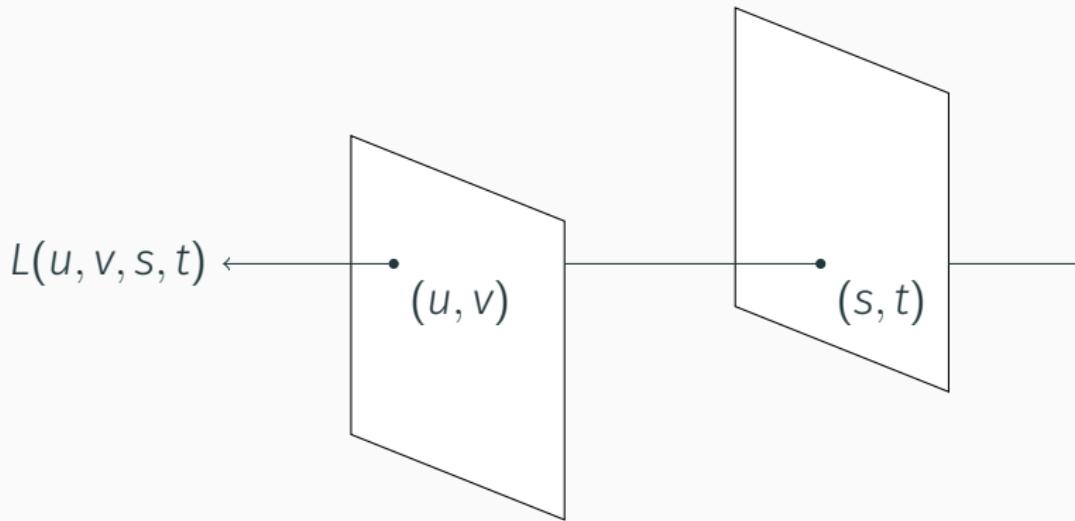
- Reduce dimensions of P

THE 4D LIGHT FIELD

- Reduce dimensions of P
- $L(u, v, s, t)$

THE 4D LIGHT FIELD

- Reduce dimensions of P
- $L(u, v, s, t)$
- Defined by two planes



LIGHT FIELD ACQUISITION

- Camera array



LIGHT FIELD ACQUISITION

- Camera array
- Camera gantry



LIGHT FIELD ACQUISITION

- Camera array
- Camera gantry
- Plenoptic camera



PROBLEM STATEMENT

OPTIMIZATION PROBLEM

$$\begin{aligned} \operatorname{argmin}_{\alpha} \quad & \|P\alpha + \bar{L}\|^2 \\ \text{subject to} \quad & \alpha \geq 0. \end{aligned}$$

SOLUTION

ASSESSMENT

CONCLUSION

The *mtheme* is a Beamer theme with minimal visual noise inspired by the HSRM Beamer Theme by Benjamin Weiss.

Enable the theme by loading

```
\documentclass{beamer}  
\usepackage{m}
```

Note, that you have to have Mozilla's *Fira Sans* font and XeTeX installed to enjoy this wonderful typography.

SECTIONS

Sections group slides of the same topic

```
\section{Elements}
```

for which the *mtheme* provides a nice progress indicator

...

TYPOGRAPHY

The theme provides sensible defaults to `\emph{emphasis}` text, `\alert{accent}` parts or show `\textbf{bold}` re

becomes

The theme provides sensible defaults to *emphasis* text,
accent parts or show **bold** results.

LISTS

Items	Enumerations
· Milk	1. First,
· Eggs	2. Second and
· Potatos	3. Last.

DESCRIPTIONS

PowerPoint Meeh.

Beamer Yeeeha.

ANIMATION

- This is important

ANIMATION

- This is important
- Now this

ANIMATION

- This is important
- Now this
- And now this

ANIMATION

- This is really important
- Now this
- And now this

FIGURES

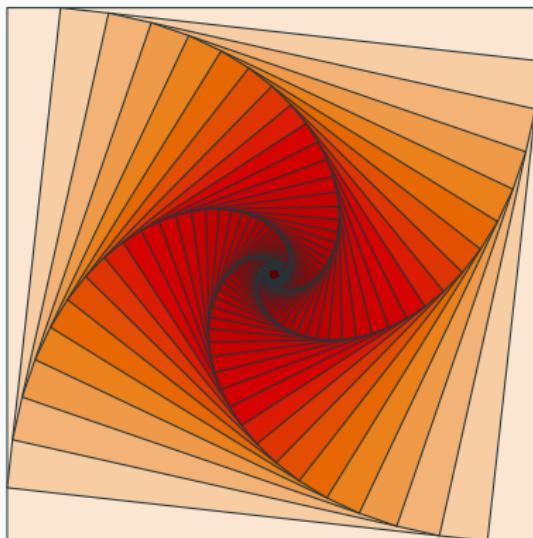


Figure: Rotated square from texample.net.

TABLES

Table: Largest cities in the world (source: Wikipedia)

City	Population
Mexico City	20,116,842
Shanghai	19,210,000
Peking	15,796,450
Istanbul	14,160,467

BLOCKS

This is a block title

This is soothing.

$$e = \lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n$$

QUOTES

Veni, Vidi, Vici

DARK BACKGROUND



SUMMARY

Get the source of this theme and the demo presentation from

github.com/matze/mtheme

The theme *itself* is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.



QUESTIONS?