

# ATTENUATION-BASED LIGHT FIELD DISPLAYS

Bachelor Thesis

---

Adrian Wälchli

June 3, 2016

Institut für Informatik und angewandte Mathematik

# OUTLINE

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

# MOTIVATION

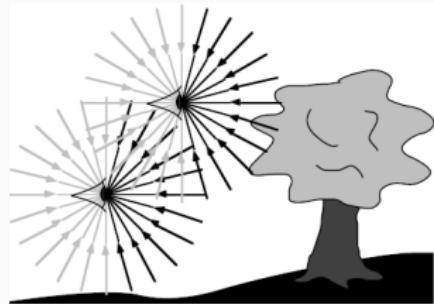
---

# INTRODUCTION TO LIGHT FIELDS

---

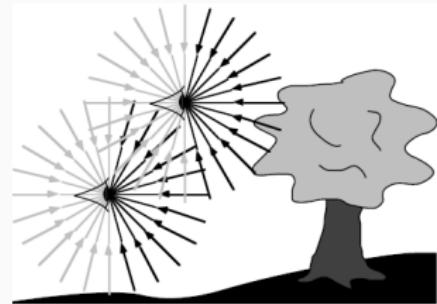
# THE PLENOPTIC FUNCTION

- Measures light in the world



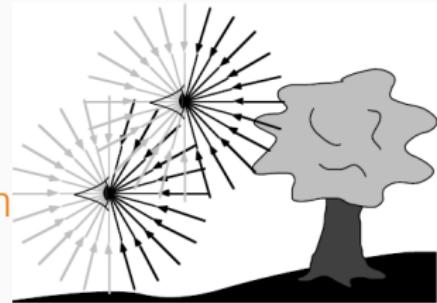
# THE PLENOPTIC FUNCTION

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



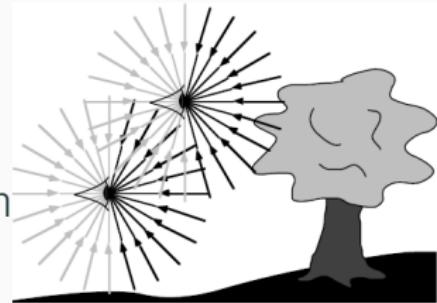
# THE PLENOPTIC FUNCTION

- 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

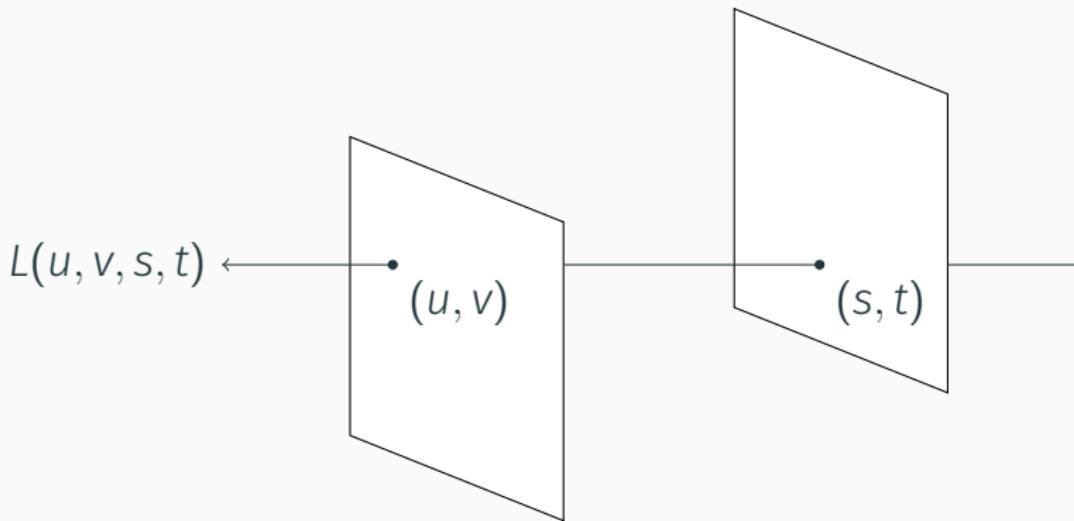
- Reduce dimensions of  $P$

# 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



# THE 4D LIGHT FIELD

- Camera array



# THE 4D LIGHT FIELD

- Camera array
- Plenoptic camera



# PROBLEM STATEMENT

---

# 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

...

# ELEMENTS

---

# 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

- Milk
- Eggs
- Potatos

## Enumerations

1. First,
2. Second and
3. Last.

# DESCRIPTIONS

PowerPoint Meeh.

Beamer Yeeeha.

# ANIMATION

- This is important

# ANIMATION

- This is important
- Now this

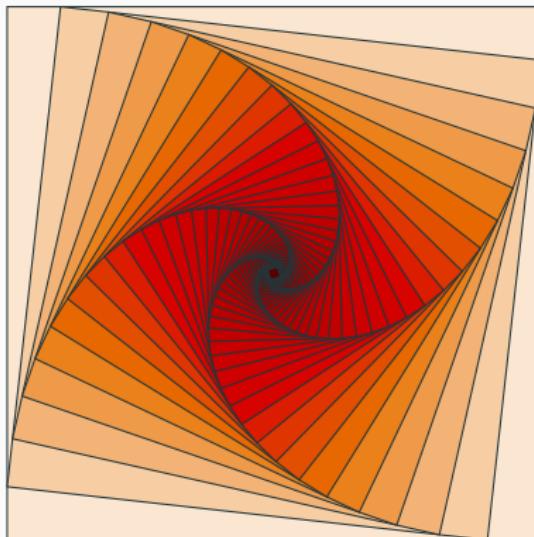
# ANIMATION

- 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](http://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



# CONCLUSION

---

## SUMMARY

Get the source of this theme and the demo presentation from

[github.com/matze/mtheme](https://github.com/matze/mtheme)

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



QUESTIONS?