

# Proseminar

# Wissenschaftliche Veröffentlichung

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# Forschung



... führt zu Erkenntnis

- Wie teile ich meine Erkenntnis mit?
- Wie mache ich sie nachvollziehbar?

# Die wissenschaftliche Arbeit



- Präsentation von Ergebnissen
  - Sind die Ergebnisse neu?
  - Sind die Ergebnisse richtig?
  - Wie hoch ist der empirische Gehalt der Ergebnisse?

# Die wissenschaftliche Arbeit



- Unterschiedliche Arten von Artikeln
  - Forschung (Studien, Modelle, Algorithmen)
  - Position
  - Applikation
  - Survey
  - Technischer Bericht
  - ...

# Bewertung wissenschaftlicher Arbeit



- Novelty
- Significance
- Scientific impact
- Contribution to the field
- Readability & organisation

# Beispiele ...



- Ich entwerfe einen neuen Videocodec und publiziere Algorithmen für En- und Decoder
- Wie oben, nur zeige ich dass mein neuer Videocodec dieselbe Bildqualität bei halber Übertragungsrate liefert.

# Die wissenschaftliche Arbeit

- Titel
- Autoren
- Abstract
- Metadaten
- Body
- [Kontext]

## Video Retargeting: Automating Pan and Scan

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### ABSTRACT

When a video is displayed on a smaller display than originally intended, some of the information in the video is necessarily lost. In this paper, we introduce *Video Retargeting* that adapts video to better suit the target display, minimizing the important information lost. We define a framework that measures the preservation of the source material, and methods for estimating the important information in the video. Video retargeting crops each frame and scales it to fit the target display. An optimization process minimizes information loss by balancing the loss of detail due to scaling with the loss of content and composition due to cropping. The cropping window can be moved during a shot to introduce virtual pans and cuts, subject to constraints that ensure cinematic plausibility. We demonstrate results of adapting a variety of source videos to small display sizes.

### Categories and Subject Descriptors

I.4.9 [Image Processing and Computer Vision]: Applications

### General Terms

Algorithms, Human Factors

### Keywords

Video retargeting, Video editing, Mobile multimedia, Importance estimation

### 1. INTRODUCTION

Viewing video on small screens is becoming increasingly common as portable devices become more capable and popular. Unfortunately, most source material is originally intended for larger displays, such as televisions and theater screens. If such video is presented naively, by simply scaling it to fit the small screen, important parts of the image become too small to see. To make matters worse, small

displays often have different aspect ratios than larger ones, requiring either an anisotropic “squish” or padding the video to fill the display. Small displays are limited to display less content than larger ones; our goal is to enable effective small display by retaining what is important.

This paper considers the problem of *video retargeting*, that is, adapting a video so that it is better suited for viewing on a display different than was originally intended. Video retargeting applies two operations to each frame of a video: cropping, which discards information outside of a window and disturbs the composition of the image; and scaling, which loses details of the image especially as objects become too small to recognize, and distorts the image if the scaling is anisotropic.

In this paper, we introduce an approach for automatically retargeting video to displays of different sizes and aspect ratios. This intelligent retargeting solution uses the video content to determine how to best combine cropping and scaling: unimportant aspects of the frame are cropped away so that more important content appears at a larger scale. We cast the retargeting as an optimization problem: what new video least damages the content of the original video. By moving the cropping window, video retargeting can create virtual pans and cuts to better portray dynamic shots. While our focus is on adapting edited films and videos for small displays, the methods are also applicable for automatically adapting wide format videos (such as feature films) to other aspect ratios (such as standard television).

Cropping discards considerable information. Not only is the content of the cropped portion lost, but we also lose the intended composition of the original frame. Composition is important in video as filmmakers use it in subtle ways to convey emotion and story. However, for small devices the alternative, downsampling the image to a tiny size that where objects are potentially too small to be recognized, is often worse. In essence, we choose to selectively lose some information from cropping in the hope of avoiding losing all information from scaling. Examples are shown in Figure 1.

In video, the motion on screen has significance beyond individual frames. Not only do objects move, but also filmmakers move the camera to achieve their desired goals. These latter effects are often subtle, yet significant: a zoom-in to create a feeling of connection or the timing of cuts to establish pacing. Therefore, video retargeting must not only consider how each frame is cropped, but also how this cropping affects motion. Rather than computing the cropping for each frame, we must be careful not to introduce new motions that will be obvious artifacts or significantly destroy

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- **Informativ & Beschreibend**
  - Was können Leser erwarten wenn sie den Artikel lesen?
- **Attraktiv**
  - Motiviert der Titel zum Lesen?
- **Klassifizierend**
  - In welches Fachgebiet gehört der Artikel
- **Beispiele**
  - Liu & Gleicher. „Video Retargeting: Automating Pan & Zoom“, <http://dx.doi.org/10.1145/1180639.1180702>
  - Cao et al. “MindFinder: interactive sketch-based image search on millions of images”, <http://dx.doi.org/10.1145/1873951.1874299>



# Autoren



- Wer hat an dem Artikel gearbeitet
  - Rückschlüsse auf die Forschungsgruppe
- Reihung abhängig von Gebiet & Gruppe

# Abstract



- Zusammenfassung des Artikels
- Teaser für den Leser
  - Als Hilfestellung zum Lesen
  - Zum Abwägen ob von Interesse

# Abstract: Example



When a video is displayed on a smaller display than originally intended, some of the information in the video is necessarily lost. In this paper, we introduce *Video Retargeting* that adapts video to better suit the target display, minimizing the important information lost. We define a framework that measures the preservation of the source material, and methods for estimating the important information in the video. Video retargeting crops each frame and scales it to fit the target display. An optimization process minimizes information loss by balancing the loss of detail due to scaling with the loss of content and composition due to cropping. The cropping window can be moved during a shot to introduce virtual pans and cuts, subject to constraints that ensure cinematic plausibility. We demonstrate results of adapting a variety of source videos to small display sizes.

# Abstract: Example



## Context

When a video is displayed on a smaller display than originally intended, some of the information in the video is necessarily lost. In this paper, we introduce *Video Retargeting* that adapts video to better suit the target display, minimizing the important information lost. We define a framework that measures the

What do we do?

How?

preservation of the source material, and methods for estimating the important information in the video. Video retargeting crops each frame and scales it to fit the target display. An optimization process minimizes information loss by balancing the loss of detail due to scaling with the loss of content and composition due to cropping. The cropping window can be moved during a shot to introduce virtual pans and cuts, subject to constraints that ensure cinematic plausibility. We demonstrate results of adapting a variety of source videos to small display sizes.

How good are the results? Evaluation!

# Metadaten



- Vorgabe durch Template
- Stichworte & Klassifikation
  - <http://www.acm.org/about/class/>
- Auf Richtigkeit achten!

- H. Information Systems
  - H.0 GENERAL
  - H.1 MODELS AND PRINCIPLES
    - H.1.0 General
    - H.1.1 Systems and Information Theory (E.4)
      - *General systems theory*
      - *Information theory*
      - *Value of information*
    - H.1.2 User/Machine Systems
      - *Human factors*
      - *Human information processing*
      - *Software psychology* **NEW!**
    - H.1.m Miscellaneous

# Body



- Introduction
  - Gibt Kontext und Problemstellung an, Struktur
  - Hätt-i-war-i ....
- Related Work
  - Was gibt's noch? Warum reicht das nicht?
- Evaluation
  - Geht das auch? Ist das besser?
- Conclusion
  - Keine „Summary“!
- Future Work & Acknowledgements