

# Efficient film digitization and restoration: Making of the 20th century film archives accessible

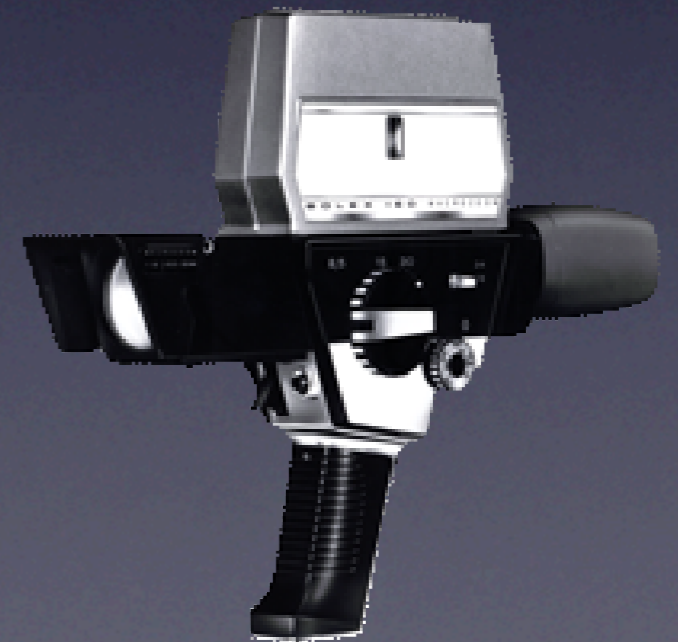


Cinetis SA  
Jean-Pierre Gehrig CEO

Practitioner Day of the CIVR on Friday July 10, 2009

# OUTLINE

- Cinetis
- Bolex Digital
- Film transfer workflow
- Smoovee



# CINETIS THE COMPANY

- Founded by 2005 by
  - Pierre Ihmle (the businessman)
  - Myself (the techie)
- Team
  - 5 video/film operators
  - 3 software developers
- Partnerships with
  - Bolex International
  - IDIAP Research Institute, EPFL, HES-SO
- Awards
  - European Seal Award in Multimedia, CeBIT 2006
  - IMD Startup Competition, 2007

- **Consumer formats**
  - Film (Super8, Normal8, 9.5mm, 16mm)
  - Video (Video8, Hi8, Digital8, VHS, VHS-C, SVHS)
- **Private customers and institutions**
  - 90% private
  - 10% institutional (local archives, cinematheques, ...)
- **Supervised workflow**
  - We keep our eyes on images where appreciation is required
  - We use computers for repetitive tasks
- **More than 22'000 reels/tapes (4600 hours)  
transferred for 3000 clients**

# WORKFLOW

SUPERVISED

UNSUPERVISED

## 1. INGEST

FILM / VIDEO  
DIGITIZATION

## 2. PROCESS

MOTION ESTIMATION

SHOT DETECTION

SHOT CLASSIFICATION

VIDEO STABILIZATION

COLOR GRADING

CUSTOM EDITING

## 3. DELIVER

DVD

MOVIE FILE

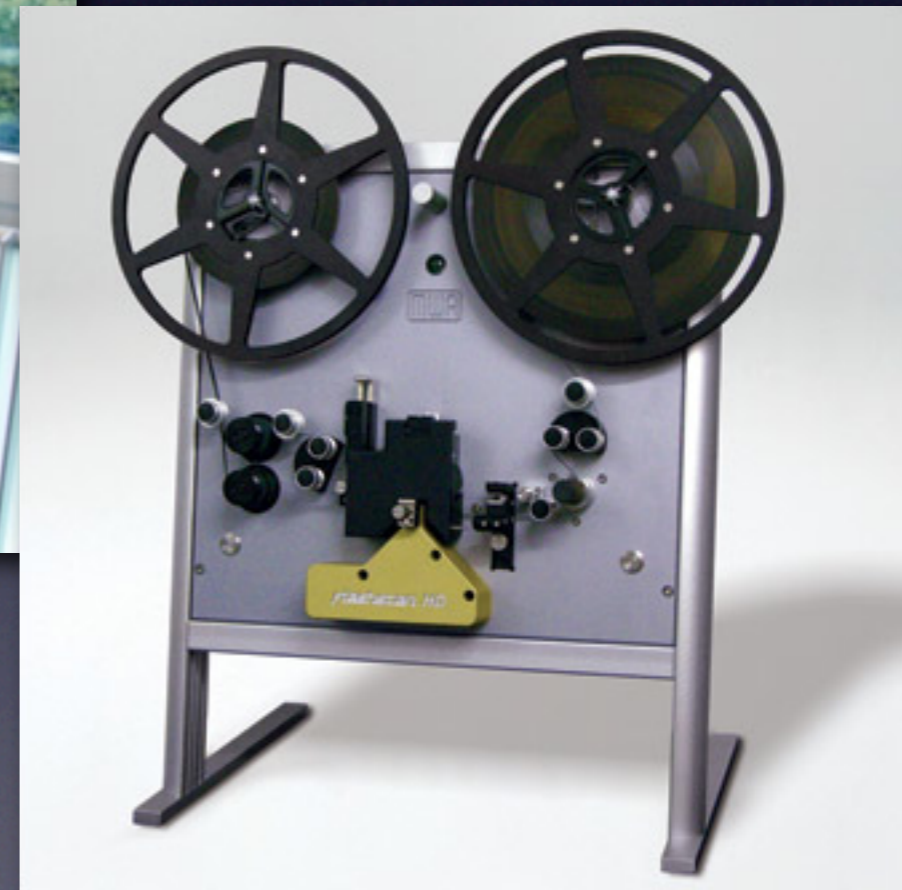
VIDEO TAPE

WEB

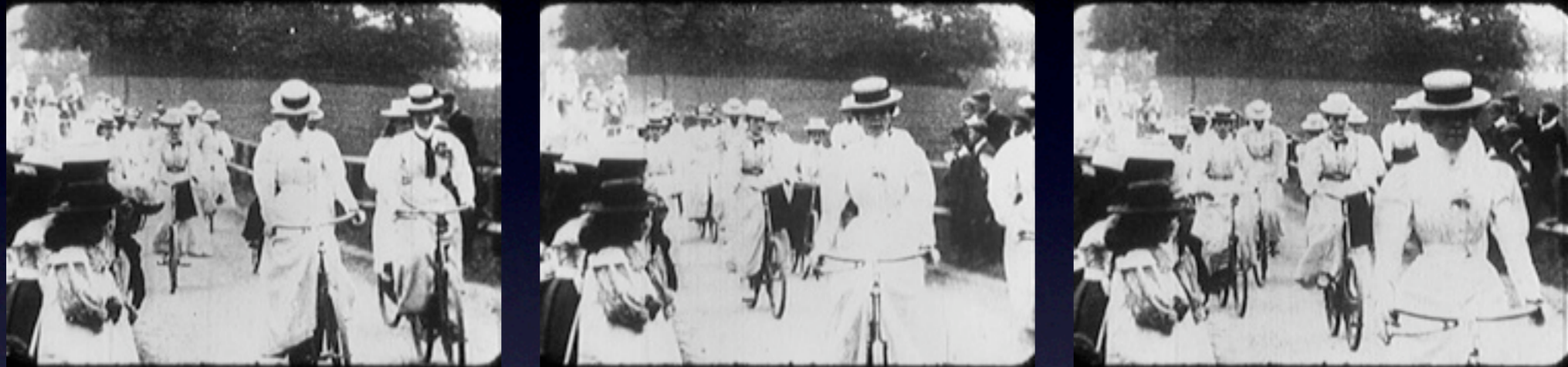
PACKAGING

DELIVERY

# DIGITIZATION



# MOTION ESTIMATION



- Based on *Motion2D* algorithm
  - robust multi-resolution motion model estimation
  - originally developed by Jean-Marc Odobez at Irisa/INRIA
- Works very well on scanned film material
- Runs on Apple XServe : film duration x 8

# SHOT DETECTION



MOTION  
DISCONTINUITY



AND



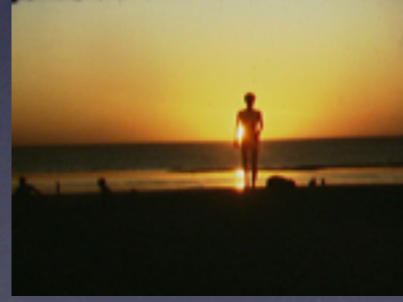
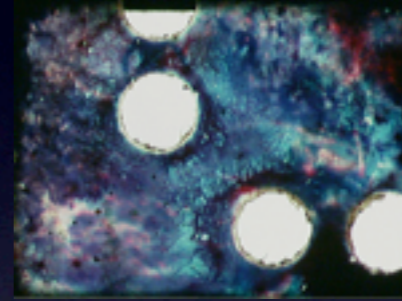
COLOR  
DISCONTINUITY



NEW SHOT

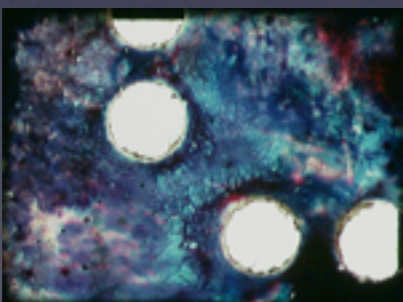


# SHOT CLASSIFICATION



# SHOT CLASSIFICATION

## Trash



## Keep



# VIDEO STABILIZATION





European Seal of Excellence  
CeBIT 2006  
Hannover



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## Zeppelin

Location

Geneva

Year

1930

00:00 | 100 x

# Smooovee Automatic video stabilizer



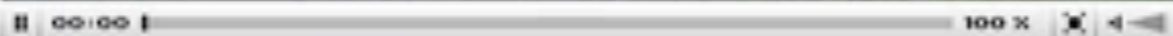

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## Smoozee stabilizes your shaky movies !

Smoozee is an online video stabilization service which takes shaky movies and make them look like they were shoot with a SteadyCam. Automatically.

[Try it out](#)

### VTT ride

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by pierre593  
views 51



SF  
synthet...  
by pierre593  
views 14



mamma  
by Barnabe  
views 41



thomas 3  
by nic  
views 68



thomas 2  
by nic  
views 36



thomas 1  
by nic  
views 33

# NEXT STEPS

- **Smooovee 2.0**
  - Motion estimator refactoring for realtime analysis
  - Global or shot-by-shot operation
  - Windows version
- **Better shot detector**
  - Robust to fades (in, out, cross)
- **Move to high definition film scanning**
  - Even if 8mm film doesn't contain enough data, but customers want Full HD today.

# THANK YOU



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