

# Social Video: A Platform for Collaborative Discoverability and Annotation of Disconnected Media

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David Killeffer

*May 21, 2016*  
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Harvard University Extension School



**HARVARD**  
Extension School

Department of Information Technology

Proposal

**Social Video: A Platform for Collaborative  
Discoverability and Annotation of Disconnected  
Media**

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# Abstract

There are very few good tools available that allow people to digitally categorize recorded videos. This is a problem because with the rise of digitization of recordings previously created on magnetic media and other media as well as the proliferation of smartphones, there is an ever-growing volume of videos being made available to people, but a severe lack of ways to organize and search those videos. The absence of good tooling often means that many people amass large collections of self-recorded videos (both digital as well as older, analogue format recordings such as VHS, Mini-DV, etc.) which are largely inaccessible and make it extremely difficult to locate past recordings due to the absence of meaningful metadata. With the rise of cheap, large online storage resources and very powerful handheld recording devices, but few and inadequate tools to catalog them, there is a looming problem that many videos will go unwatched and uncared for, and the importance of their content go forgotten. By utilizing an easy to use web interface, this project attempts to bring the power of crowds to aid in adding metadata and meaningful annotations to online video for the benefit of other viewers.

Even if an individuals video recordings were somehow properly "tagged" with perfectly accurate metadata describing all the pertinent aspects of the video, without a rich, well-designed and easy to use search interface, the effort expended on such annotations would be wasted and the future utility of the recordings still in question. This project attempts to prototype a fully-featured, easy-to-use, faceted search interface which will help make locating and sharing recordings of precious memories easy and enjoyable. Additionally, once videos are properly tagged and annotated, users can explore further avenues to enrich sets of recordings by making "playlists" of segments of videos; for example, creating a "highlight reel" which is a playlist of all the recordings in a set that are tagged with the word "funny".



# Acknowledgements

I would like to acknowledge the excellent help, guidance, and wisdom of both Susan Buck and Dr. Jeff Parker. They provided much needed tips and feedback over the course of the development of this thesis proposal which helped make it successful.

I want to also acknowledge and thank my wife Sarah and kids; thank you for being patient with me, putting up with my moods as I struggled through this process, and for all the tea.





# Contents



# Problem Statement

“ *You can't do better design with a computer, but you can speed up your work enormously.*

— **Wim Crouwel**

(Graphic designer and typographer)

## 1.1 Motivation and Problem Statement

Several years ago my siblings and I lost our two remaining grandparents; my maternal grandmother, and my paternal grandfather, both within a couple years of each other. These were difficult losses to take, and I was left thinking of them often and the times we had together. At the same time, I was recently married and had started a family of my own, and enjoying all the highs, lows, and excitement of being a part of a young family with children. With sentimentality creeping into my mind more and more, we would often videotape our young son, and then his younger brother, and making memories with our children and saving them to video for posterity. Several years later I found myself with a very large collection of both VHS and Mini-DV tapes (well over a hundred tapes, at least), and I realized that my wife, kids, and I had not viewed most of these recordings, not even since they were originally taped. At an extended family dinner I inquired about all the old VHS tapes my parents had recorded of us kids growing up, including several important family milestones and a few select events that my grandparents would have been a part of; I was told that I was free to take any videotapes I could find. I did the same thing with my in-laws and gathered up all their old videotapes as well; soon I found myself in the possession of a virtual mountain of videotapes, some up to 25 years old. I knew that over time videotapes degrade and are subject to a process of "vinegarization" (see [http://www.clir.org/pubs/reports/pub54/2what\\_wrong.html](http://www.clir.org/pubs/reports/pub54/2what_wrong.html) and <http://www.emeraldartservices.com/visual-media-deterioration/>), and I knew that if I wanted to preserve all the precious memories that were captured on those tapes that I would need to digitize this collection.

Thus began a process of over a year's worth of work whereby I slowly digitized nearly 200 analogue tapes of various formats; VHS, Mini-DV, VHS-C, etc. Initially I was tempted to edit and cleanup the recordings as I imported them, but soon I found

out just how much time and effort is involved in doing high-quality video editing and cleanup, and I realized I would never finish digitizing the tape collection if I stopped digitizing to edit each tape. Eventually I was able to successfully digitize about 99% of the videotape collection, and I was left with an enormous set of video files (one per tape). Some statistics of the collection:

- TODO: number of video files
- TODO: total disk size of all video files
- TODO: total number of hours of recordings

While I certainly loved being able to go back and re-live many funny childhood moments that were now immortalized on an external hard drive, I quickly came to realize several things about my new massive video file collection:

1. I did not know who was in several of the videos, but I knew that my mom/my dad/my father-in-law/my uncle/etc. would know
2. I did not know when many of the recordings took place
3. I did not know where some of the recordings were made
4. It was extremely difficult and time-consuming to be able to properly share old historical family moments from the video collection with the family because the videos were only labeled by type (VHS, Mini-DV, etc.) and tape number

The last point is perhaps the most poignant. In my eagerness and excitement to share my newfound digital video treasure trove with my family, I fumbled at several family dinners and gatherings when I was requested to play the *"funny barbecue video from 1987 where Nate accidentally hit cousin Al in the head"*, and several other classic family gems; I simply couldn't find videos that I was looking for without basically brute-forcing my way and playing each video, fast-forwarding through the video until either I found (or did not find) what I was looking for, and then wrote down what video and at what time "that moment" that I was looking for was found in. The problem was that despite having invested over a year's worth of time and effort into preserving all these old family videos, it wasn't worth much to everybody else (or me!) in their current form ***because nobody could find what they actually wanted to see without watching the entire collection.*** And this revelation was the genesis of my thesis idea; to create a platform where I could leverage the knowledge and memories of my family to help me build up a set of rich metadata to annotate the family video collection, and then to reward them for their help in annotating the videos by building out a rich, faceted search interface to the video collection, as well

as creating the ability to create "playlists" where users can make their own "highlight reels" of special moments, people, places, etc.



## Prior Work

” *A picture is worth a thousand words. An interface is worth a thousand pictures.*

— **Ben Shneiderman**  
(Professor for Computer Science)

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# Requirements

” *Innovation distinguishes between a leader and a follower.*

— **Steve Jobs**  
(CEO Apple Inc.)

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**Fig. 3.1:** Figure example: (a) example part one, (c) example part two; (c) example part three

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## 3.2 Requirements Section 2

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**Fig. 3.2:** Another Figure example: (a) example part one, (c) example part two; (c) example part three

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## 3.4 Conclusion

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# System

“ *Innovation distinguishes between a leader and a follower.*

— **Steve Jobs**  
(CEO Apple Inc.)

And after the second paragraph follows the third paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

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## 4.1 System Section 1

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**Fig. 4.1:** Figure example: (a) example part one, (c) example part two; (c) example part three

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**Fig. 4.2:** Another Figure example: (a) example part one, (c) example part two; (c) example part three

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## 4.3 System Section 3

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## 4.4 Conclusion

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# Design

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— **Steve Jobs**  
(CEO Apple Inc.)

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## 5.1 Design Section 1

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**Fig. 5.1:** Figure example: (a) example part one, (c) example part two; (c) example part three

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## 5.2 Design Section 2

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**Fig. 5.2:** Another Figure example: (a) example part one, (c) example part two; (c) example part three

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## 5.4 Conclusion

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# Work Plan

” *A picture is worth a thousand words. An interface is worth a thousand pictures.*

— **Ben Shneiderman**  
(Professor for Computer Science)

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## 6.1 Work Plan Section 1

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## 6.2 Work Plan Section 2

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# Risks and Alternatives

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# Preliminary Schedule

” *A picture is worth a thousand words. An interface is worth a thousand pictures.*

— **Ben Shneiderman**  
(Professor for Computer Science)

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## List of Figures



## List of Tables



## Glossary

Here are some of the terms used throughout this proposal.

DVD: Digital Video Disc

Mini-DV: a successor to the wildly popular VHS home recording system, Mini-DV is a cassette tape format for video recording. It captures video in a resolution close to that of DVD. (see <http://techterms.com/definition/minidv>)

VHS: VHS: acronym for "Video Home System", it is a widely-adopted videocassette recording ( VCR ) technology that was developed by Japan Victor Company (JVC) and put on the market in 1976. It uses magnetic tape 1/2 inch (1.27 cm) in width. It was extremely popular in the 1980s and 1990s, and declined in use during the early 2000s. (adapted from <http://whatis.techtarget.com/definition/VHS-Video-Home-System> and <https://en.wikipedia.org/wiki/VHS>)



## Colophon

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# Declaration

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*Cambridge, Massachusetts, May 21, 2016*

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David Killeffer

