



Semantic video annotations in the Topics API

Theory and practice

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We want to help content creators make their content more easily discoverable and help API developers to get the most out of semantic annotations on YouTube.



YouTube Topics API

YouTube associates resources (videos, channels) with Freebase topics.

The Topics API exposes the following functions:

- See the Freebase topics associated with YouTube resources
- Find YouTube resources associated with Freebase topics.



Outline

- Existing consumers of video annotations and the Topics API
- Video annotation example: before and after
- Video annotation process
- Tips for improving annotations
- Walkthrough of a demo application
- Future work





Who uses this

(Hint: cool kids)

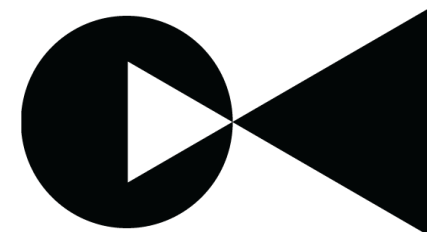
YouTube and API users

- Homepage content and clustering
- Video and Channel recommendations
- Search
- YouTube house channels
- YouTube's channel browser



interessante

seevl



SHOWYOU





Annotations for uploads

What's this video about?



What's this video about: Topics API



<https://www.googleapis.com/>



What's this video about: Topics API



<https://www.googleapis.com/youtube/v3>



What's this video about: Topics API



<https://www.googleapis.com/youtube/v3/videos?id=wN7UusS8Hfc>



What's this video about: Topics API



[https://www.googleapis.com/youtube/v3
/videos?id=wN7UusS8Hfc&part=topicDetails&key={YOUR_API_KEY}](https://www.googleapis.com/youtube/v3/videos?id=wN7UusS8Hfc&part=topicDetails&key={YOUR_API_KEY})



What's this video about: Topics API

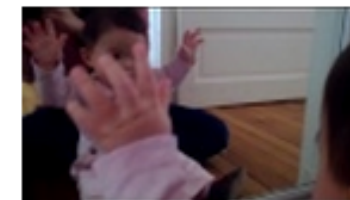
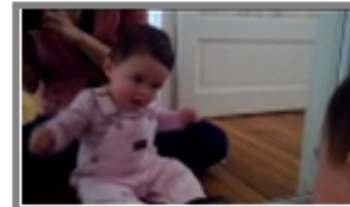
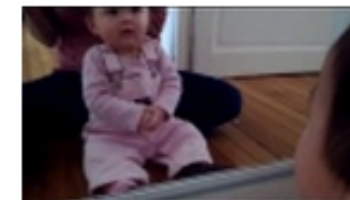


https://www.googleapis.com/youtube/v3/videos?id=wN7UusS8Hfc&part=topicDetails&key={YOUR_API_KEY}

```
{
  "kind": "youtube#videoListResponse",
  "etag": "\"q5EFha4MlIFsv3CHCRICCAU0wsE/HSzxDIrgAGSrsav253CQA4GOUC0\"",
  "items": [
    {
      "id": "wN7UusS8Hfc",
      "kind": "youtube#video",
      "etag": "\"q5EFha4MlIFsv3CHCRICCAU0wsE/xIRcDuUgoIKWAgIL3j_Kp9JKdkw\""
    },
    ...
  ]
}
```



Infant seeing herself while playing in front of a mirror.



VIDEO INFORMATION

Uploaded time: Apr

Duration: 0:1

Raw File: yt-e

Views:

Likes:

Dislikes:

Comments:

Video URL:

Basic Info [Advanced Settings](#)

Title

Infant seeing herself while playing in front of a mirror.

Description

Here is my little cutie pie (then 9-months old baby) was playing in front of our mirror. With her big eyes, she's an especially adorable infant, the attractiveness is inherited! She is so cute when she does a little shake in front of her reflection, she looks like she has her own dance moves. She's in love: the kid looks like she is trying to kiss herself.

Tags

Cuteness (Website Category) Playing cute baby funny

Suggested tags:

[+ Infant \(Risk Factor\)](#) [+ Website \(Industry\)](#) [+ Baby \(musical\)](#)

[+ Laughing](#) [+ Toy](#) [+ Laugh](#) [+ Guitar](#) [+ Toys](#)

Privacy Settings

Public

Anyone can search for and view

Post to your subscribers



Customize your message

Category

Entertainment



What's this video about: Topics API



https://www.googleapis.com/youtube/v3/videos?id=uyK2LOMSH7I&part=topicDetails&key={YOUR_API_KEY}

...

{

"id": "uyK2LOMSH7I",

"kind": "youtube#video",

"etag": "\"q5EFha4MIIFsv3CHCRICCAU0wsE/V3USZrU1QmCPUleydY5z08p78Fw\"",

"topicDetails": {

"topicIds": [

"/m/0jnvp",

"/m/04h3kx"

]

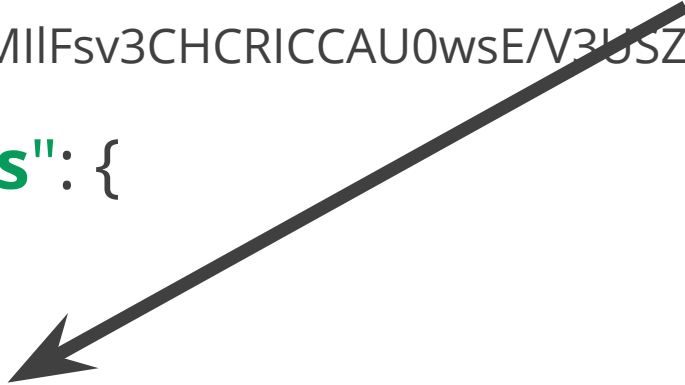
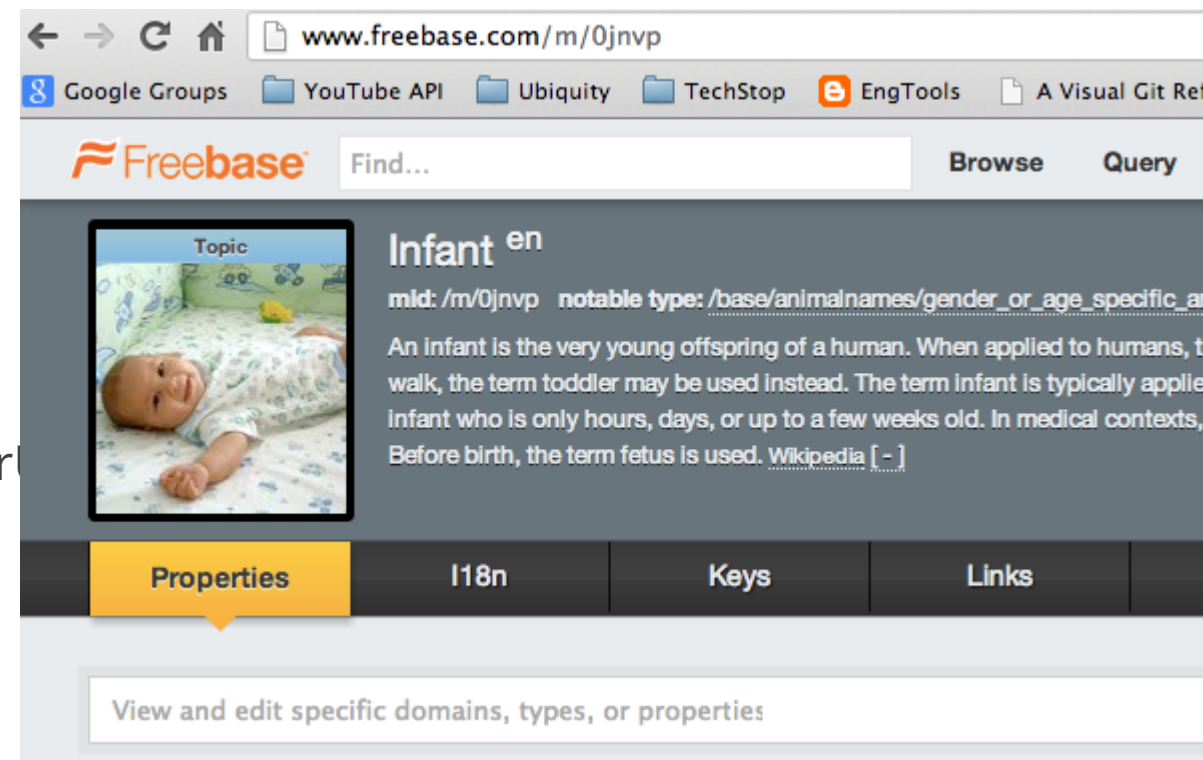


What's this video about: Topics API



https://www.googleapis.com/youtube/v3/videos?id=uyK2LOMSH7I&part=topicDetails&&key={YOUR_API_KEY}

```
...
{
  "id": "uyK2LOMSH7I",
  "kind": "youtube#video",
  "etag": "\"q5EFha4MIIFsv3CHCRICCAU0wsE/V3USZr...",
  "topicDetails": {
    "topicIds": [
      "/m/0jnvp",
      "/m/04h3kx"
    ]
  }
}
```



What's this video about: Topics API



https://www.googleapis.com/youtube/v3/videos?id=uyK2LOMSH7I&part=topicDetails&&key={YOUR_API_KEY}

...

{

"id": "uyK2LOMSH7I",

"kind": "youtube#video",

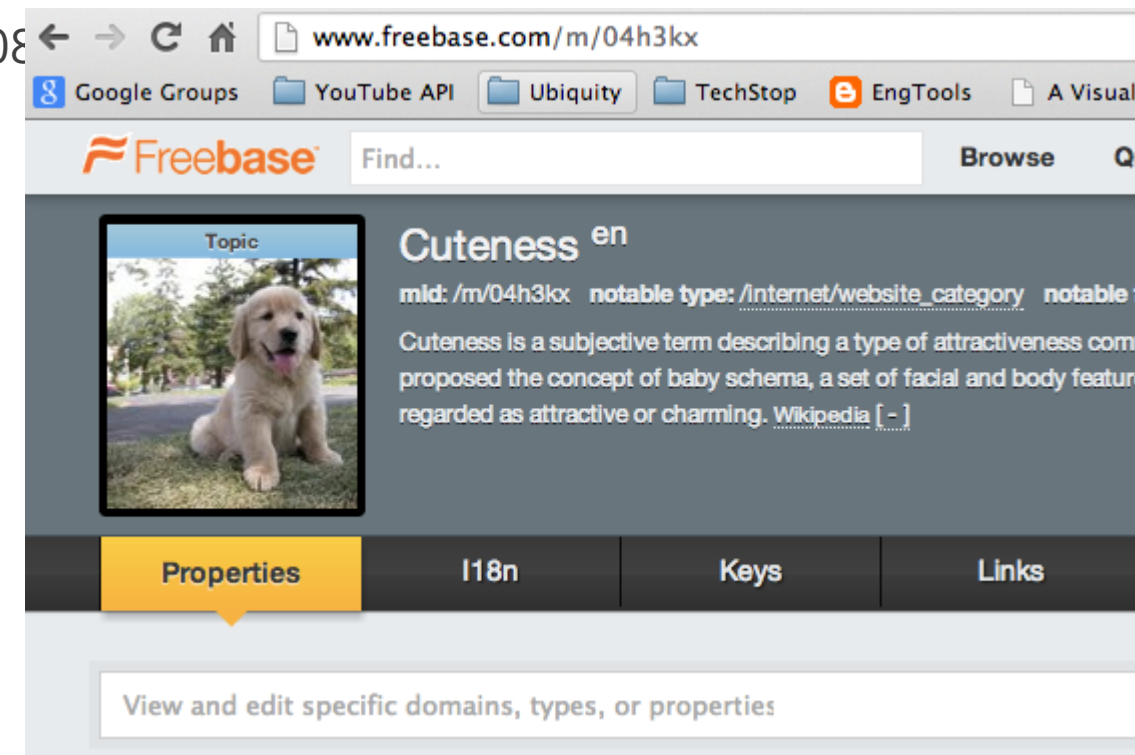
"etag": "\"q5EFha4MIIFsv3CHCRICCAU0wsE/V3USZrU1QmCPUleydY5z08"

"topicDetails": {

"topicIds": [

"/m/0jnvp",

"/m/04h3kx"

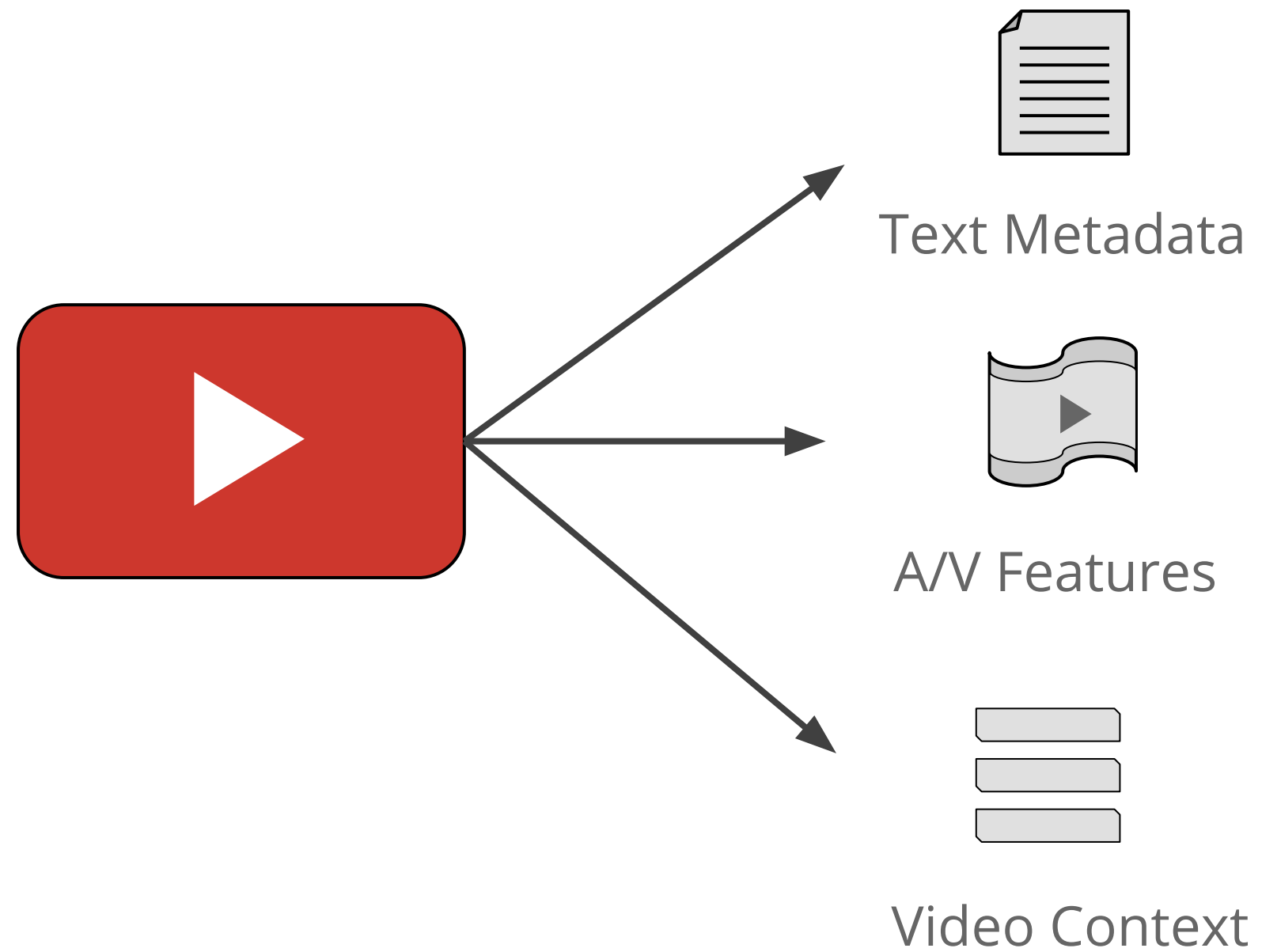




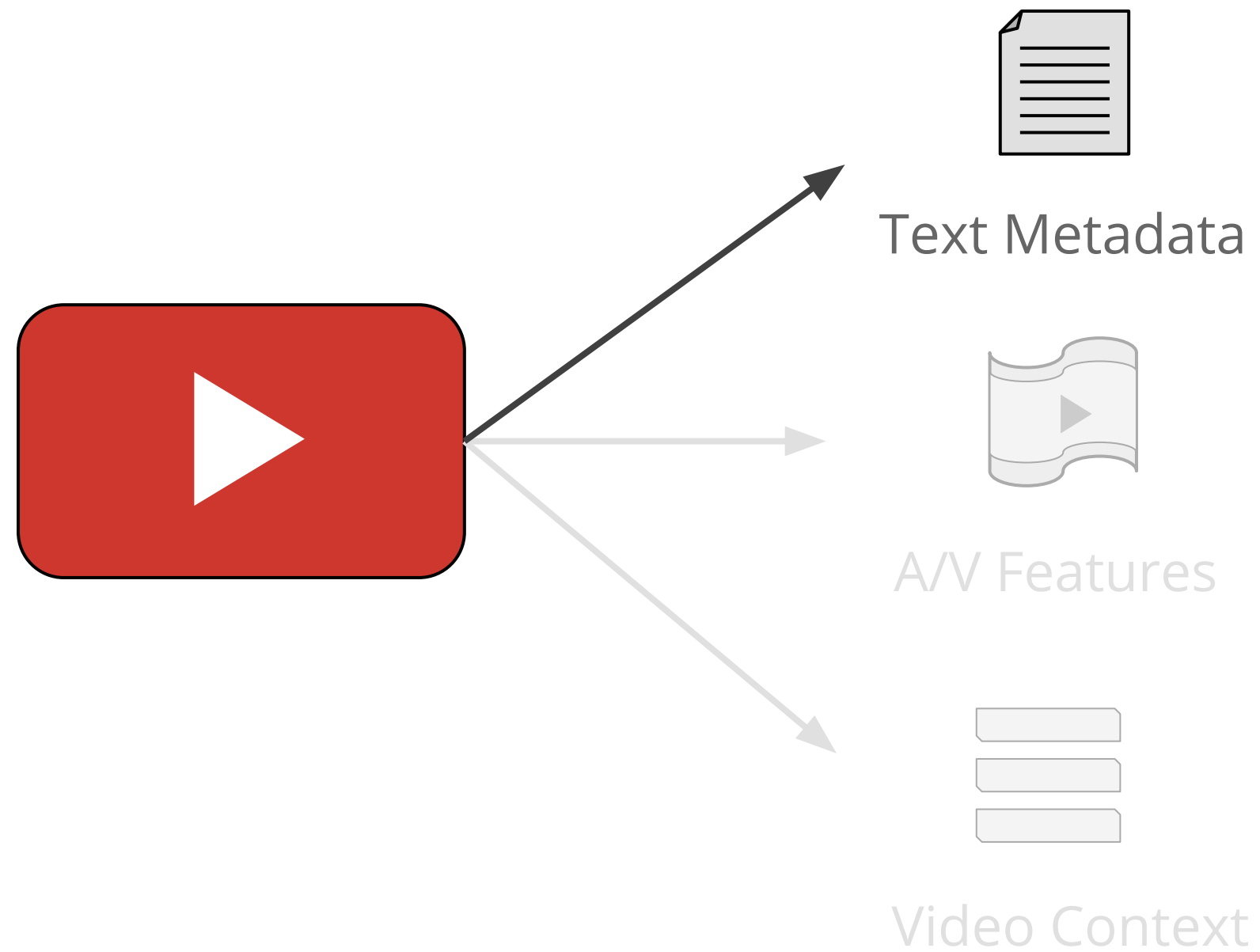
How videos are annotated

Annotation by example

Video Annotation Data Sources



Video Annotation Data Sources: Text Metadata



Video Annotation Data Sources: Text Metadata

- Title, Description, Tags
- Many-to-many associations
- Entity extraction from consistent text
- Availability: Immediate



0:45 / 1:55

Infant seeing herself while playing in front of a mirror.

Shirley Gaw · 1 video 15 views

Subscribe 0

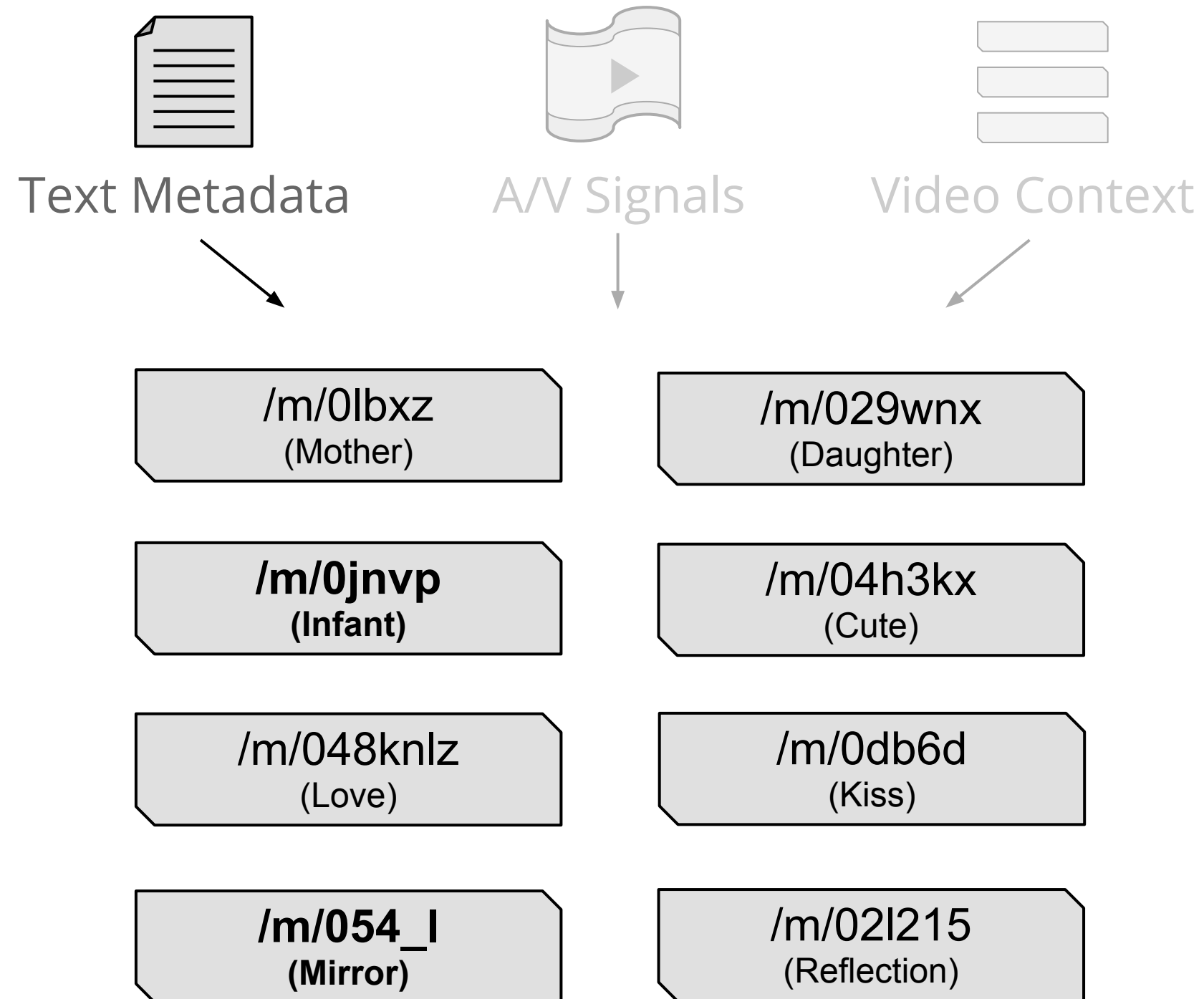
Like About Share Add to

Published on Apr 10, 2013
Here is my daughter (then 9-months old baby) was playing in front of our mirror. Totally adorable infant! She is so cute when she does a little shake in front of her reflection, she looks like she has her own dance moves. She's in love: the kid looks like she is trying to kiss herself. Mommy is recording the event in the background.

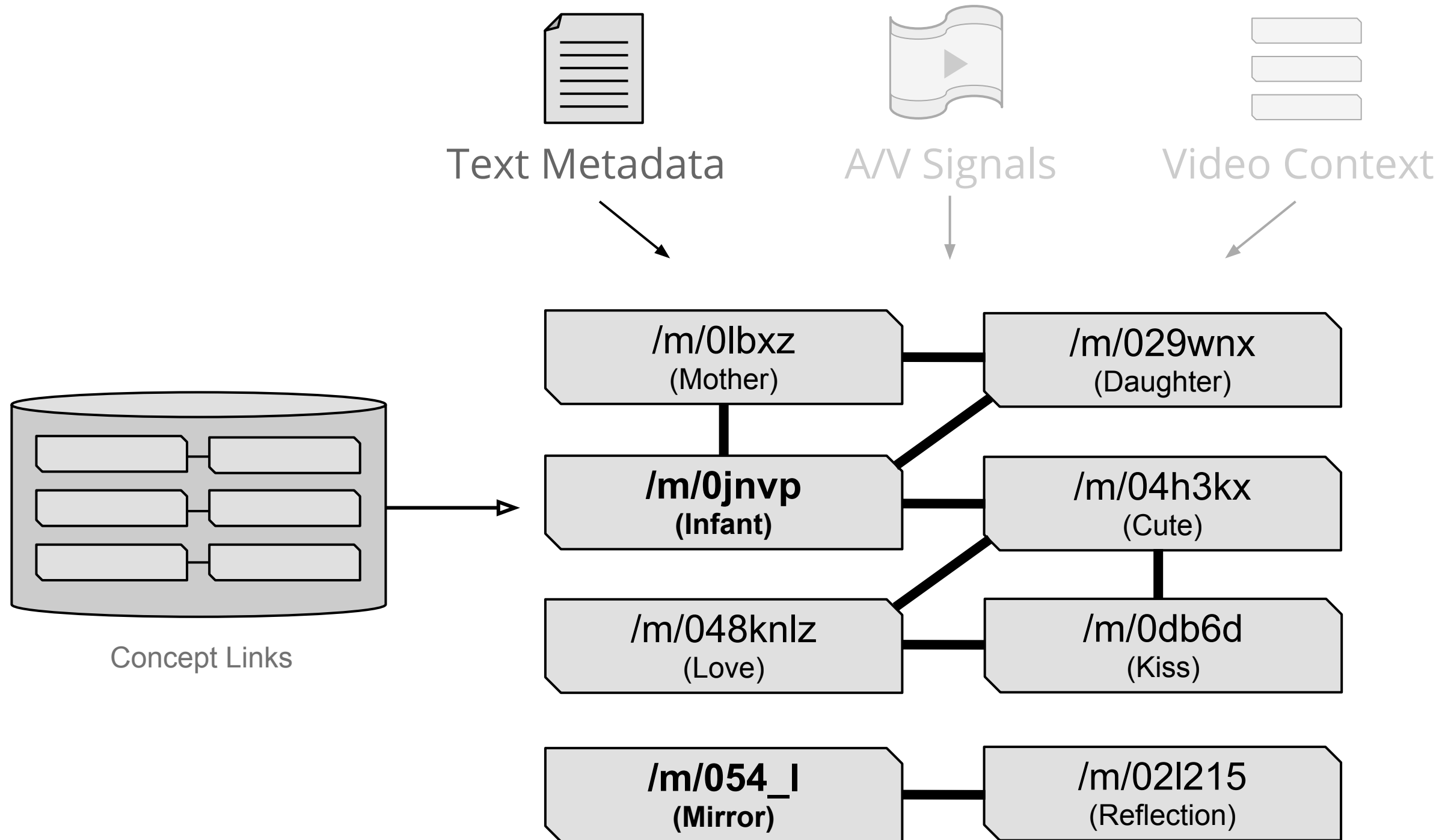
Category Entertainment
License Standard YouTube License



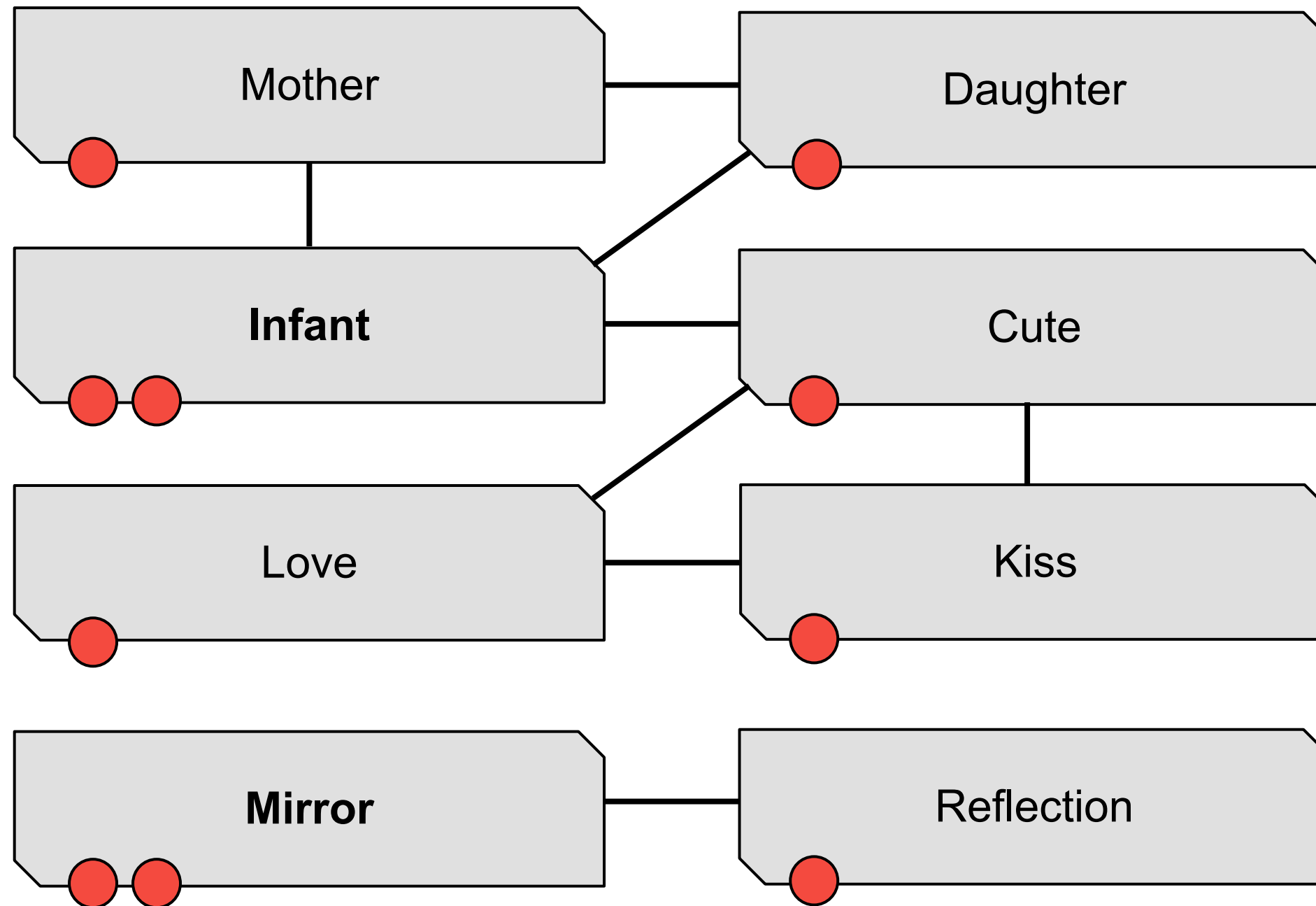
Video Annotation: Graph Building



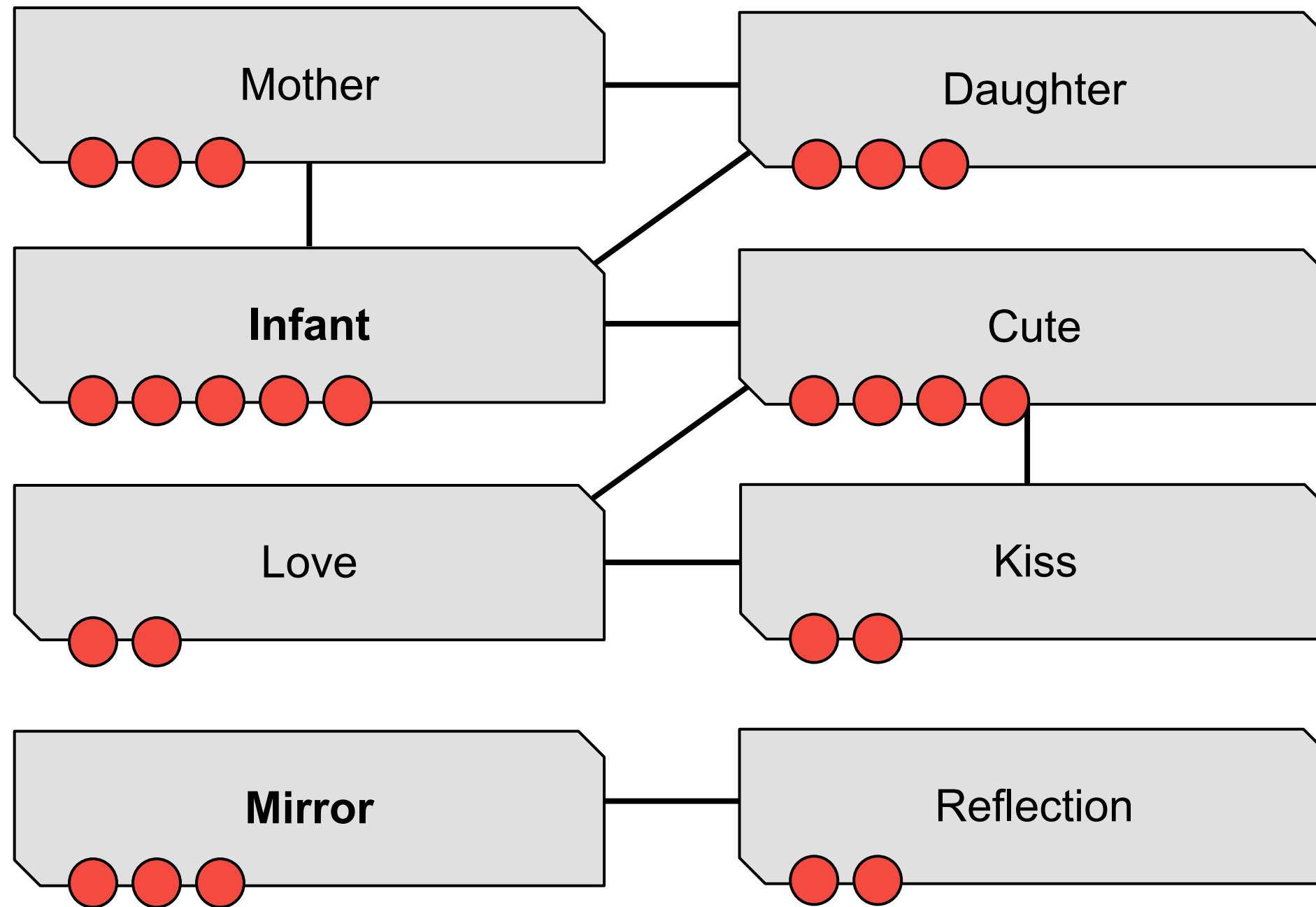
Video Annotation: Graph Building



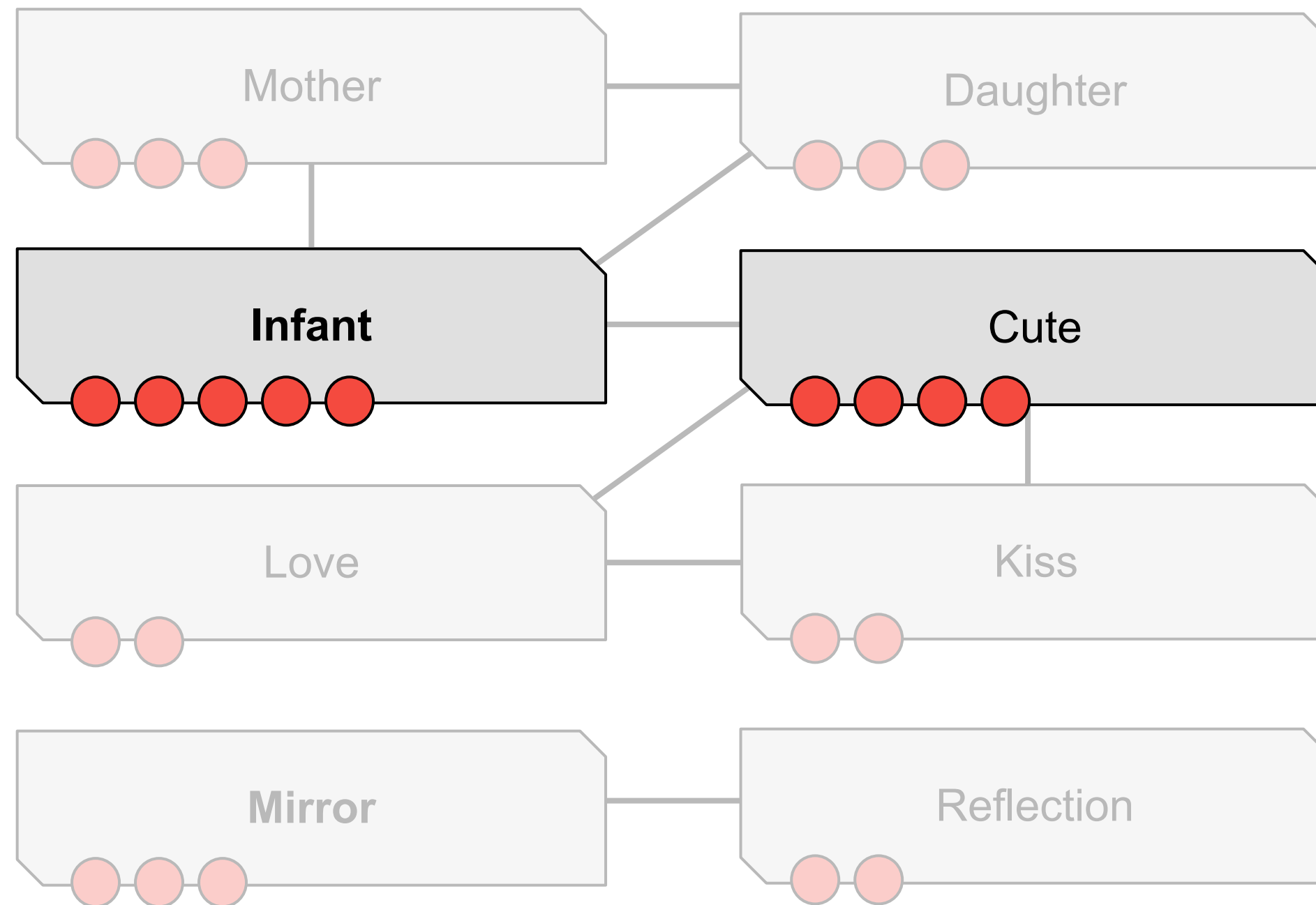
Video Annotation: Scoring and Ranking



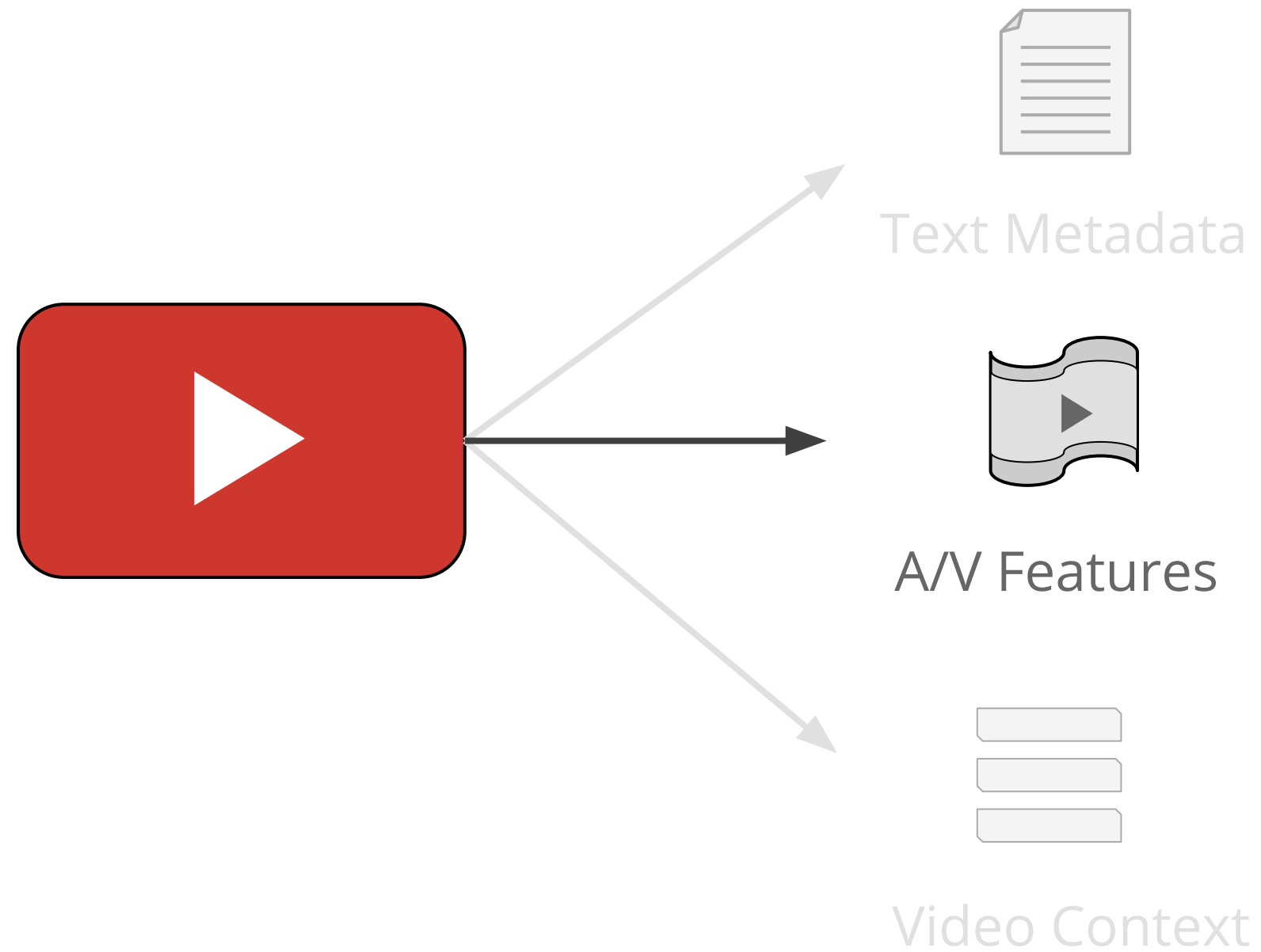
Video Annotation: Scoring and Ranking



Video Annotation: Scoring and Ranking

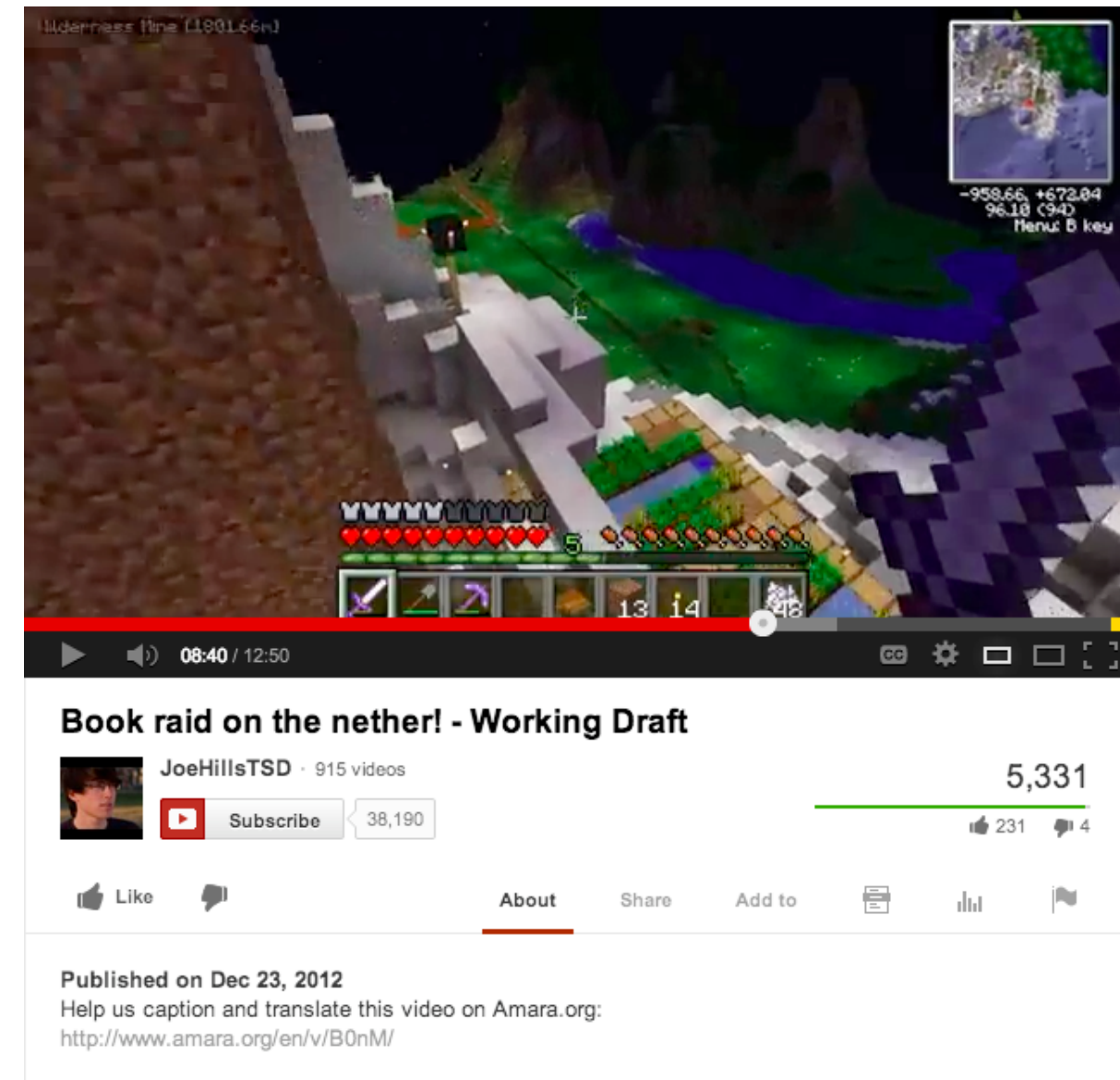


Video Annotation Data Sources: A/V Features

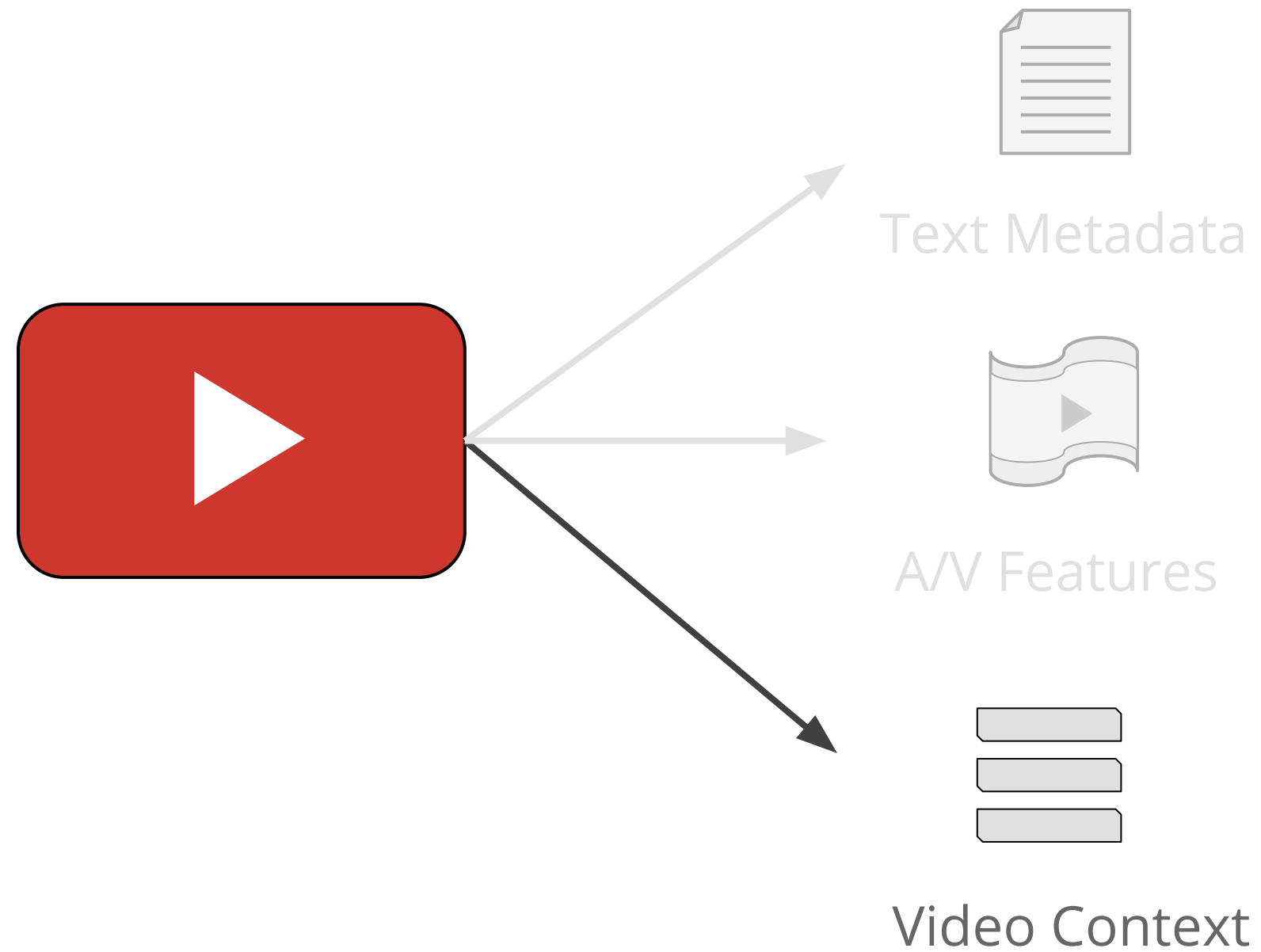


Video Annotation Data Sources: A/V Features

- Audio and Video signal classification
 - Ideal for games
 - Less ideal for general content
 - Active development
- Availability: Minutes after upload




Video Annotation Data Sources: Video Context



Video Annotation Data Sources: Video Context

- Entities from context
 - Comments
 - Web embeds
 - User engagement
- Noisy but useful signals
 - "Jawed Karim"
 - Web embeds and comments agree
- Availability: Function of popularity



0:09 / 0:20

Me at the zoo

jawed · 1 video

Subscribe 35,853

10,981,771

79,487 5,447

Like About Share Add to

Uploaded on Apr 23, 2005

The first video on YouTube, uploaded at 8:27 P.M. on Saturday April 23rd, 2005. The video was shot by Yakov Lapitsky at the San Diego Zoo.

Remix this video!

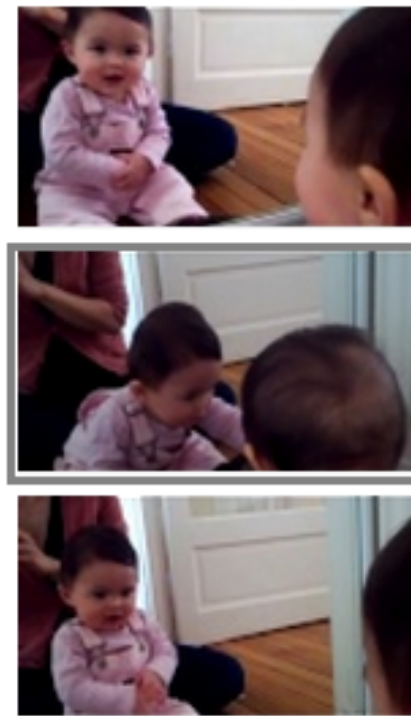




Annotations in Practice

Playing in front of the mirror

Cancel Saved



VIDEO INFORMATION

Uploaded time: November 13, 2012 8:37 PM
Duration: 1:55
Raw File: VID_20120314_135602.mp4
Views: 15
Likes: 0
Dislikes: 0
Comments: 0
Video URL:

Annotations are only on public videos

Basic Info Advanced Settings

Title

Playing in front of the mirror

Title does not accurately describe content.

Description

No tags nor description

Tags

Separate tags with commas

Privacy Settings

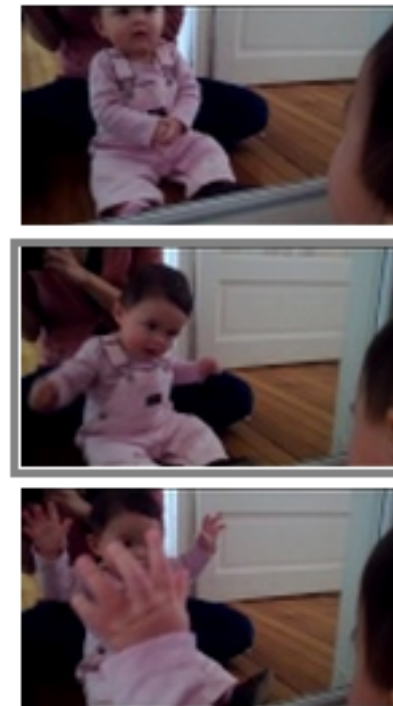
Unlisted

Anyone with the link can view

Category

People & Blogs

Infant seeing herself while playing in front of a mirror.



VIDEO INFORMATION
Uploaded time: Apr
Duration: 0:1
Raw File: yt-
Views:
Likes:
Dislikes:
Comments:
Video URL:

Annotations are only on public videos

Basic Info Advanced Settings

Title

Infant seeing herself while playing in front of a mirror.

Title includes subject

Description

Here is my little cutie pie (then 9-months old baby) was playing in front of our mirror. With her big eyes, she's an especially adorable infant, the attractiveness is inherited! She is so cute when she does a little shak has her own dance moves. She's in love!

Tags, description reinforce title

Tags

Cuteness (Website Category) ✕ Playing ✕ cute ✕ baby ✕ funny ✕

Privacy Settings

Public

Anyone can search for and view

Post to your subscribers

Customize your message

Entertainment



Understanding centrality

- Central: complete, specific, compact
- Ex: Semantic Video Annotations in the YouTube Topics API: Theory and Applications
 - [Semantic Annotation], [Google IO 2013], [Youtube API]
 - [Semantic Annotations in the Youtube API at Google IO 2013]
- Would you include it...
 - ...in your summary of this video
 - ...on a channel about this topic
- Relevant is not central
- Related is not central



What to expect with annotations

- 1-3 specific annotations
- Annotation consumers can use canonical types, freebase data dumps
- Annotation quality increases with video popularity
- Uploaders can bootstrap annotations
 - Precise titles
 - Cohesive descriptions
 - NOT: song lyrics, video production details, etc.





Demo

Grouping videos by canonical type

What just happened?

- Search for 100 videos that were annotated with Origami
- Look up the notable types of each video-entity annotation
- Cluster entities by notable types (ex: Cat, Bat, etc. in Organism)
- Show videos with Organism-type entities grouped by entity



Demo API calls

Freebase suggest widget



topic id



video ids



central topic ids



Universal search (topicId=...)



Freebase search

Freebase suggestion widget

<https://developers.google.com/freebase/v1/search-widget>




Francis Ford

Select an item from the list:

Francis Ford Coppola	Film director
Francis Ford	Film director
Jeremy Clarkson	Film director
Philip Ford	Film director


[view more](#)



Francis Ford Coppola
Date of birth: **Apr 7, 1939**
Place of birth: **Detroit**
Country of nationality: **United States of America**

Francis Ford Coppola (/ˈkoʊpələ/ koh-pə-lə; born April 7, 1939) is an American film director, producer and screenwriter. He is widely acclaimed as one of Hollywood's most celebrated and influential film directors. He epitomized the group of filmmake...

Film producer, Film director, Film writer





Demo functionality

- Generalize from specific annotations
- Leverage domain-specific knowledge
- Ex: Movie site, look for trailers, interviews with actors, etc.





Search for services, methods, and recent requests...

Loading...



APIs Explorer



☰ **Services**

☰ All Versions

🕒 Request History

youtube.playlists.list

Returns a collection of playlists that match the API request parameters. If authenticated user owns, or you can retrieve one or more playlists by the

youtube.playlists.update

Modifies a playlist. For example, you could change a playlist's title, descr

youtube.search.list

Returns a collection of search results that match the query parameters sp result set identifies matching video, channel, and playlist resources, but y specific type of resource.

youtube.subscriptions.delete

Deletes a subscription.

youtube.subscriptions.insert

Adds a subscription for the authenticated user's channel.

youtube.subscriptions.list

Returns subscription resources that match the API request criteria.

youtube.subscriptions.unsubscribe

youtube.videoCategories.list

Returns a list of categories that can be associated with YouTube videos.

youtube.videos.delete

Deletes a YouTube video.

youtube.videos.getRating

Get user ratings for videos.

youtube.videos.insert

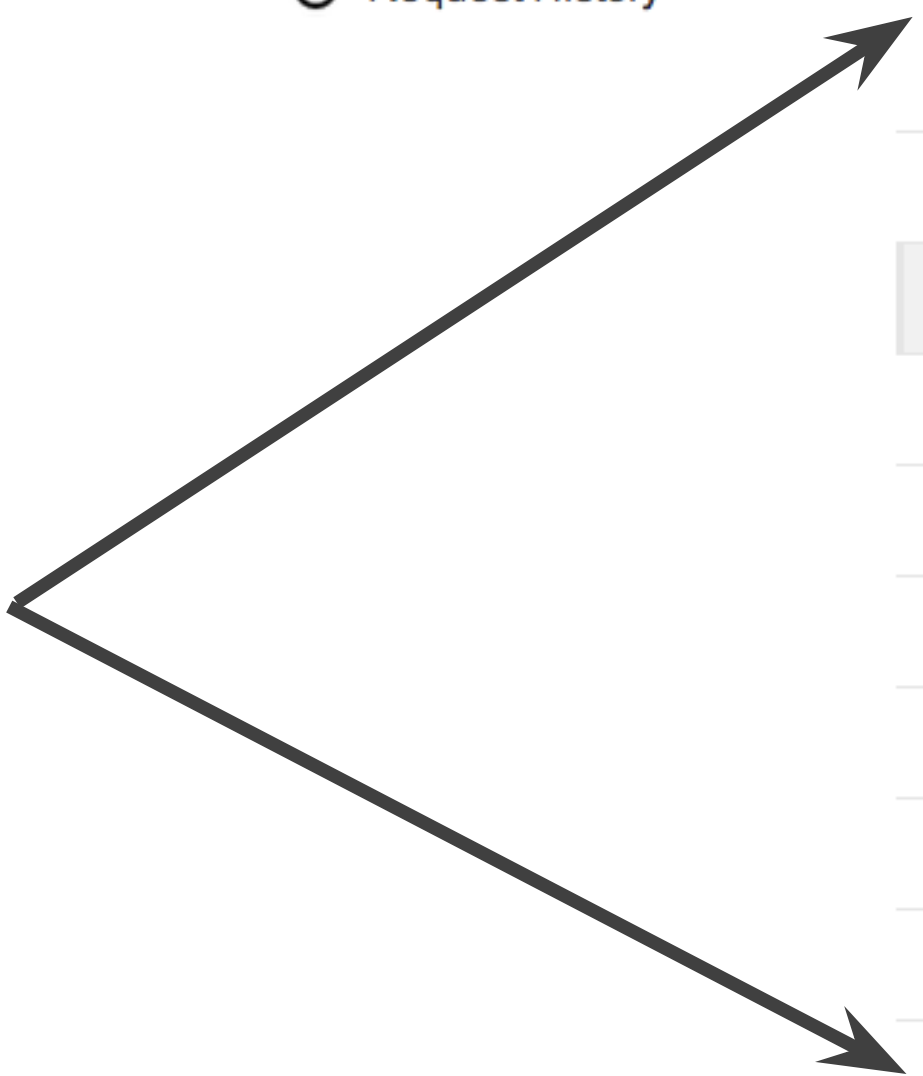
Uploads a video to YouTube and optionally sets the video's metadata.

youtube.videos.list

Returns a list of videos that match the API request parameters.

youtube.videos.rate

Like, dislike, or remove rating from a video.



Find YouTube resources by a Freebase topic



topicId	<input type="text" value="/m/0drh_"/>	The topicId parameter indicates that the API response should only contain resources associated with the specified topic. The value identifies a Freebase topic ID. (string) <small>This parameter was URL encoded.</small>
type	<input type="text"/>	The type parameter restricts a search query to only retrieve a particular type of resource. (string)
videoCaption	<input type="text"/>	The videoCaption parameter indicates whether the API should filter video search results based on whether they have captions. (string)
videoCategoryId	<input type="text"/>	The videoCategoryId parameter filters video search results based on their category. (string)

https://developers.google.com/apis-explorer/#p/youtube/v3/youtube.search.list?part=id%2Csnippet&topicId=%252Fm%252F0drh_&_h=2&



Response

200 OK

- Show headers -

```
- {
  "kind": "youtube#searchListResponse",
  "etag": "\"RNBpvJz2tqU7ewUf9qwA7GjgO78/JwFs4I-VzJ1Q4t9vVG01VE01Z2w\"",
  "pageInfo": {
    "totalResults": 91266,
    "resultsPerPage": 5
  },
  "nextPageToken": "CAUQAA",
  "items": [
    - {
      "kind": "youtube#searchResult",
      "etag": "\"RNBpvJz2tqU7ewUf9qwA7GjgO78/vJSHMRJIOoHT5gyvMh1Yp1Y3pfg\"",
      "id": {
        "kind": "youtube#video",
        "videoId": "X4L5nDDgEEk"
      },
      "snippet": {
        "publishedAt": "2009-06-12T00:37:48.000Z",
        "channelId": "UCGCo75oFuO_g6dqxtLZwu7g",
        "title": "How to Make an Origami Butterfly",
        "description": "In this tutorial, I explain how to make an origami butterfly (designed by Akira Yoda) out of a sheet of printer paper. We must first make the paper square...",
        "thumbnails": {
          "default": {
```



Video annotations

See what Freebase topics are associated with a video



Services > YouTube Data API v3 > youtube.videos.list

part

topicDetails

The part parameter specifies properties that the API returns. If the parameter identifies a property, the response contains the channelId, the video's ID, and the video's title. If you set part=snippet, the API

id

X4L5nDDgEEk

The id parameter specifies the resource(s) that are being requested. It is the video's ID. (string)

https://developers.google.com/apis-explorer/#p/youtube/v3/youtube.videos.list?part=topicDetails&id=X4L5nDDgEEk&_h=3&



Response

200 OK

- Show headers -

```
- {
  "kind": "youtube#videoListResponse",
  "etag": "\"RNBpvJz2tqU7ewUf9qwA7GjgO78/K176TnScMDWKe3ZKKlyOpwtPoPc\"",
  "items": [
    - {
      "id": "X4L5nDDgEEk",
      "kind": "youtube#video",
      "etag": "\"RNBpvJz2tqU7ewUf9qwA7GjgO78/jCFZtpp0zk7NixmuYCCutFo18Sc\"",
      "topicDetails": {
        "topicIds": [
          "/m/0drh_"
        ]
      }
    }
  ]
}
```



Notable names for Freebase topics

Filter: (any mid:<topic id>)

Freebase Search API

Query:

Limit:

Cursor:

Indent:

Exact:

Prefixed:

Filter:

Output:

Request: [https://www.googleapis.com/freebase/v1/search?query=&limit=10&filter=\(any+mid%3A%2Fr](https://www.googleapis.com/freebase/v1/search?query=&limit=10&filter=(any+mid%3A%2Fr)

```
Results:
{
  "status": "200 OK",
  "result": [
    {
      "mid": "/m/0drh_",
      "id": "/en/origami",
      "name": "Origami",
      "notable": {
        "name": "Hobby",
        "id": "/interests/hobby"
      },
      "lang": "en",
      "score": 21.161243
    }
  ],
  "total": 1,
  "hits": 1
}
```



<http://api-examples.freebaseapps.com/search>

<https://www.googleapis.com>

[/freebase/v1/search?query=&limit=10&filter=\(any+mid:/m/0drh_\)](https://www.googleapis.com/freebase/v1/search?query=&limit=10&filter=(any+mid:/m/0drh_))



Want more code? Codelab! Friday

YouTube Topics API + Freebase API





Open Issues and Future Work

Quality

- Human Evaluations
 - Video-Entity pairs
 - Off-topic, Relevant, Central per language
- Feedback
 - @YouTubeDev
 - <https://code.google.com/p/gdata-issues>
- Work in progress
 - Reducing off-topic
 - Maintaining coverage



Open Issues

- Common Knowledge
 - Rarely linked
 - Assumed well-known
- New Topics
- Local facts
- Overlapping names



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Esperanto
Euskara
Français
한국어
Hrvatski
Igbo
עברית
Ligure
Nederlands
Nedersaksies
日本語
اڙٽوٽو
پښتو
Polski
Română
Русский
Simple English
Slovenčina
Srpskohrvatski / српскохрватски
Svenska
தமிழ்
Татарча/tatarça
தெலुగు
ไทย
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اردو
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Daughter

From Wikipedia, the free encyclopedia

For other uses, see [Daughter \(disambiguation\)](#).

A **daughter** is a *female offspring*; a *girl*, *woman*, or female animal in relation to her **parents**. **Daughterhood** is the state of being a daughter. The masculine counterpart is a **son**. Analogously the name is used in several areas to show relations between groups or elements.

In *patriarchal* societies, daughters often have different or lesser familial rights than sons. A family may prefer to have sons rather than daughters, with the daughters subjected to *female infanticide*.^[1] In some societies it is the custom for a daughter to be 'sold' to her husband, who must pay a *bride price*. The reverse of this custom, where the parents pay the husband a sum of money to compensate for the financial burden of the woman, is found in societies where women do not labour outside the home, and is referred to as *dowry*.

In the United States, the birth rate is 105 sons to 100 daughters which has been the natural birth rate since the 18th century. About 80 percent of prospective adoptive parents from the US will choose a girl over a boy.

In the Bible

See also: [Lot and his daughters](#)

The Bible uses the Hebrew word *ben* ("son") about ten times as often as *bat* ("daughter"). In the Bible, a girl's father had the right to sell^[2] or give his daughter's hand in marriage. Once married off, authority over the girl passed to her new husband, who was called *ba'al* ("husband/master").^[3]

See also

- [Nurture kinship](#)

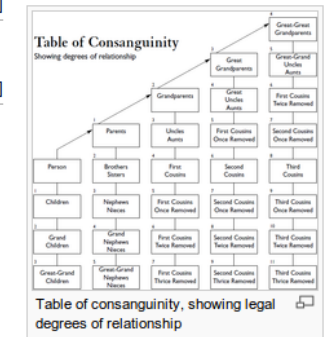
References

- ↑ Stein, Dorothy: *Burning widows, burning brides: The perils of daughterhood in India*. Pacific Affairs, Vol 61, No. 3, p. 465. University of British Columbia.
- ↑ Exodus 21:7-11
- ↑ Bronner, Leila Leah: *From Eve to Esther: Rabbinic Reconstructions of Biblical Women*. Westminster John Knox Press, 1994. ISBN 0-664-25542-6. Pages 111-112.

Look up ***daughter*** in Wiktionary, the free dictionary.



Four generations of mothers and daughters, 1931.



Wikimedia Commons has media related to: [daughters](#)

Family	
Household · Nuclear family · Extended family · Conjugal family · Stepfamily · Dysfunctional family	
Immediate family	Spouse (Husband · Wife) · Parent (Father · Mother) · Child (Son · Daughter) · Sibling
Extended family	Grandparent · Aunt · Uncle · Cousin · Nephew and niece · Common ancestor
Family-in-law	Parent-in-law · Brother-in-law · Sister-in-law
Kinship	Adoption · Affinity · Consanguinity · Disownment · Divorce · Fictive kinship · Marriage
Lineage	Bilateral descent · Family name · Family tree · Genealogy · Heirloom · Heredity · Inheritance · Matrilineality · Patrilineality · Pedigree chart
Relationships	Agape (parental love) · Eros (marital love) · Filial piety · Philia (friendly love) · Storge (familial love) · Veneration · Matrifocal family
Theories	Anti-Oedipus · Kommune 1

Categories: [Family](#) | [Women](#)

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Open Issues

- Common Knowledge
- New Topics
 - Not in Freebase / KG
 - Weak supports
- Local facts
- Overlapping names



UGA Men's Swim & Dive Harlem Shake

GeorgiaMens SwimmingDiving · 1 video

36,654,610

172,425 likes · 6,831 dislikes

Subscribe 16,890

Like Comment

About Share Add to playlist

Published on Feb 11, 2013
UGA Men's Swim and Dive Harlem Shake. SKOOO

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Buy "Harlem Shake" on

Google Play
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AmazonMP3
eMusic

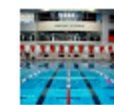


Open Issues

- Common Knowledge
- New Topics
 - Not in Freebase / KG
 - Weak supports
- Local facts
- Overlapping names



UGA Men's Swim & Dive Harlem Shake



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Harlem shake^{en}

mid: /m/0fwptq on the web: [Wikipedia.org](https://www.wikipedia.org)

The Harlem shake, originally called the albee, is a dance introduced in 1981 by a Harlem resident referred to as "albee" after his name, but later became known as the Harlem shake as its promoter. The dance became mainstream in 2001 when G. Dep featured the Harlem shake in his music video "Ghetto Club".

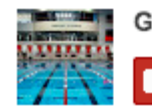


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Harlem Shake^{en}

mid: /m/0r3vbqy on the web: [Wikipedia.org](https://en.wikipedia.org)

The Harlem Shake is an Internet meme in the form of a video in which a group of people perform a short excerpt from the song "Harlem Shake". As a meme, the video was replicated by many others and rapidly led to it becoming viral in early February 2013, with thousands of "Harlem Shake" videos being uploaded every day at the height of its popularity. The form of the meme was established in a video uploaded in Queensland, Australia known on YouTube as The Sunny Coast Skate. The video started a trend of "Harlem Shake" videos to YouTube. The teenagers' video was a follow-up to a video by a user named @PeakPride which featured a section where several costumed people danced to the song "Harlem Shake".



Open Issues

- Common Knowledge
- New Topics
- Local facts
 - Limited supports
 - Increased ambiguity
- Overlapping names



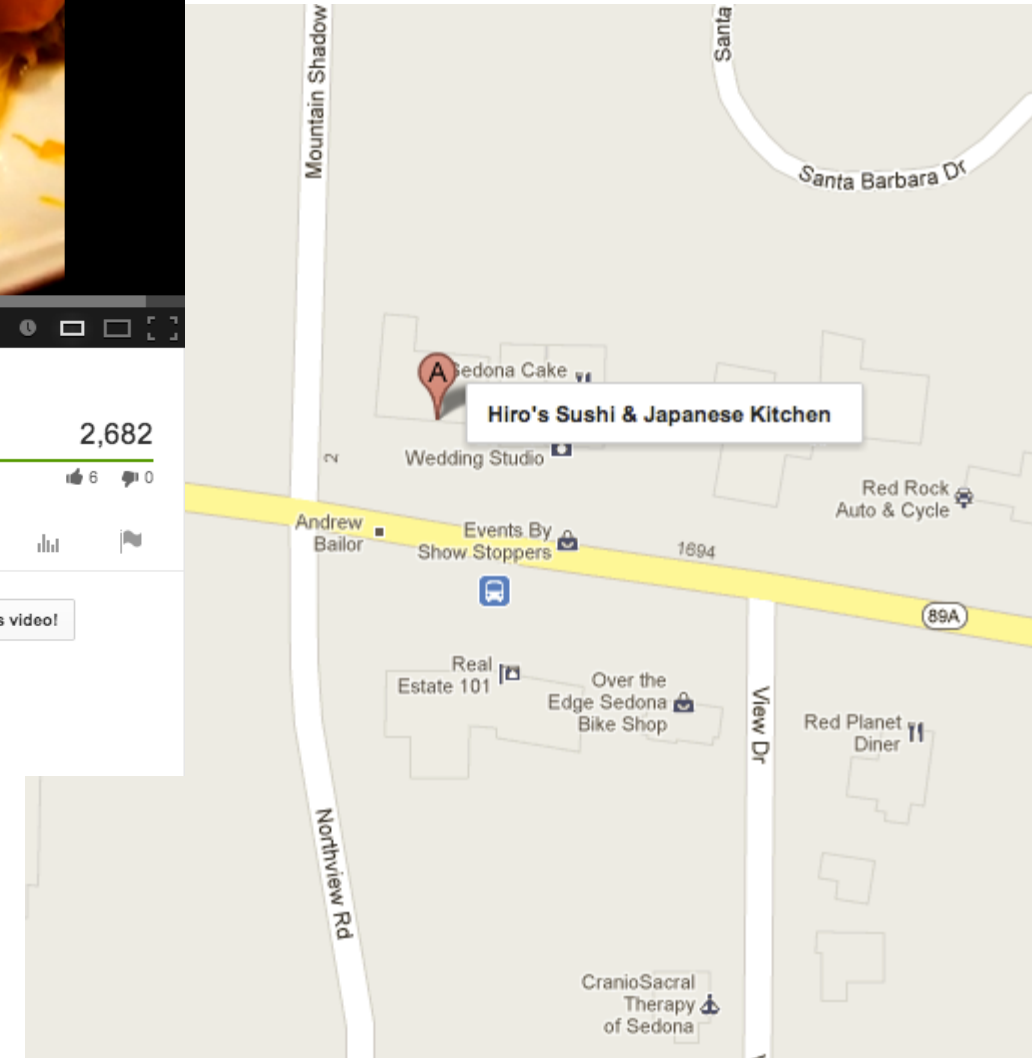
Hiro's Sushi Restaurant - "Omakase" Style - Sedona Arizona

GoalBusters · 106 videos 2,682

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Like About Share Add to Remix this video!

Uploaded on Jan 24, 2010
Sedona, AZ - Hiro's Sushi - I love to order "Omakase style." Omakase is a Japanese phrase that means "It's up to you" Or, "Chef's Choice" You offer the chef the opportunity to perform creatively and generally you pay less for more. Let me know what you think.



Open Issues

- Common Knowledge
- New Topics
- Local facts
- Overlapping names
 - Synonymous entities
 - Same concept space
 - Ex: Nirvana




Future Work

- Relevant annotations
 - Ex: Location of a live event, band members
 - Relevant is NOT low-confidence central
 - Relevant is NOT related
- Taxonomy annotations
 - Multi-tier taxonomy
 - Ex: Tennis, Racket Sports, Sports



Future Work


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A woman with blonde hair, wearing a shiny, sequined pink dress and Google Glass, is smiling and adjusting her glasses. She is in a crowded fashion show setting with other people in the background.

2:11 / 3:50

DVF [through Glass]

Google  · 1,553 videos

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Subscribe 1,570,410

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Published on Sep 13, 2012

Experience the DVF Spring 2013 show at New York Fashion Week through the eyes of the people who made it happen—the stylists, the models and Diane von Furstenberg herself. All the footage you see here was filmed using only Glass, Google's latest technology that lets you capture moments from a unique, new perspective. See what happens when fashion and technology come together like you've never seen before.



Future Work


- Central
 - Google Glass
 - Diane von Furstenberg
- Relevant
 - New York Fashion Week
- Taxonomy
 - Gadgets
 - Technology



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Thank You!

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