



Improving the TRECVID SIN runs with the uploader model

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Who is *einfeldt@gmail.com* ?

Uploaded the video `e-dv251_salk_2a_thomas_bartol_001` (also TRECVID2010_1053)

```
<?xml version="1.0" encoding="UTF-8"?>
<metadata>
<identifier>e-dv251_salk_2a_thomas_bartol_001.ogg</identifier>
<title>Digital Tipping Point: Thomas Bartol, computational
neuroscientist for the Salk Institute 01</title>
<collection>digitaltippingpoint</collection>
<collection>computersandtechvideos</collection>
<description>This is one of many short video segments...
<uploader>einfeldt@gmail.com</uploader>
```

- Uploaded **423** videos of the **dev** collection
- Uploaded **118** videos of the **test** collection

Content

- **Uploader statistics**
- **Uploader model**
- **Improving EURECOM SIN runs**
- **Improving (all) TRECVID SIN runs**
- **Conclusions**

Note: all results are for the SIN Light task

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Uploader statistics

- **Intra-collection statistics :**

	Videos	Videos with Uploader	Different uploaders
Development	19,701	19,331 (98.1%)	4,415
Test	8,263	8,073 (97.7%)	2,505

- **Inter-collection statistics :**

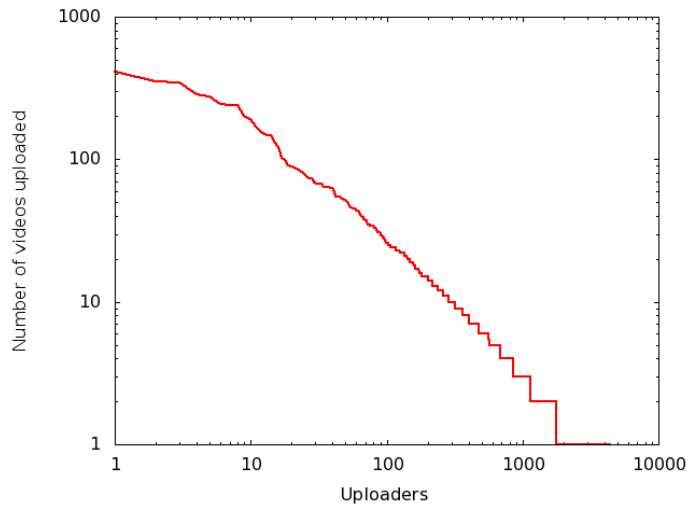
Test	Total	With dev uploader	
Videos	8,263	6,914	83.7%
Shots	145,634	118,845	81.6%

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Uploader distribution

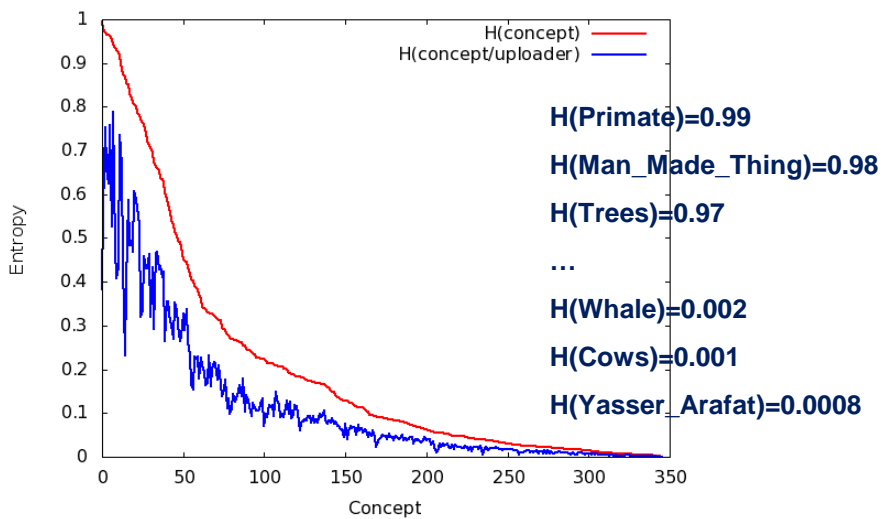


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Information gain by uploader



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Uploader model

- How to define $p(\text{concept} / \text{uploader})$?

- Video v :**

- Number of shots : $N(v)$

- Number of shots containing the concept c : $N_+(v,c)$

$$p(c / u) = \frac{\sum_{v \text{ uploaded by } u} \frac{N_+(v,c)}{N(v)}}{\#\{\text{videos uploaded by } u\}}$$

- Concept score update for a shot s from a video uploaded by u :**

$$\text{Score}_{\text{uploader}}(c,s) = \text{Score}(c,s) \times \left(1 + \max \left\{ 0, \frac{p(c|u) - p(c)}{p(c|u) + p(c)} \right\} \right)$$

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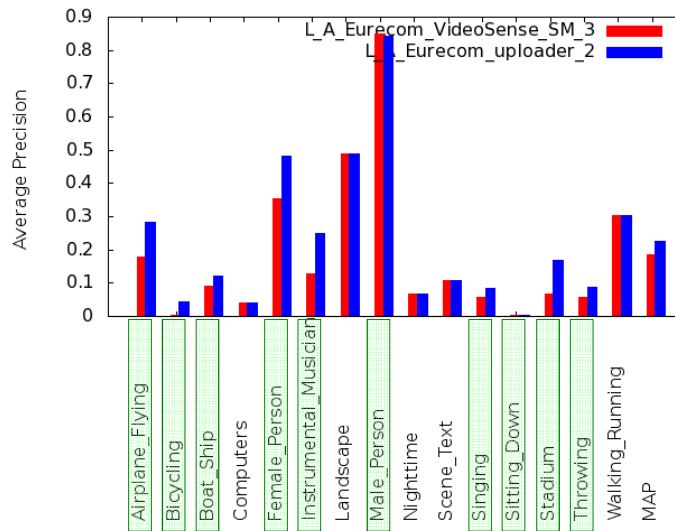
Concept with uploader model	Concepts without uploader model
Adult	Asian_People
Airplane_Flying	Building
Animal	Bus
Bicycling	Cheering
Boat_Ship	Cityscape
Car	Classroom
Dancing	Computer_Or_Television_Screens
Dark-skinned_People	Computers
Female_Person	Demonstration_Or_Protest
Flowers	Doorway
Indoor	Explosion_Fire
Indoor_Sports_Venue	Female-Human-Face-Closeup
Infants	Ground_Vehicles
Instrumental_Musician	Hand
Male_Person	Helicopter_Hovering
News_Studio	Landscape
Old_People	Military_Base
Running	Mountain
Singing	Nighttime
Sitting_Down	Plant
Stadium	Road
Swimming	Scene_Text
Telephones	Vehicle
Throwing	Walking
Waterscape_Waterfront	Walking_Running

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Improving EURECOM SIN runs



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Improving EURECOM SIN runs

Concept	Run 3	Run 2 with uploader model
Airplane_Flying	0.1750	0.2804
Bicycling	0.0001	0.0388
Boat_Ship	0.0861	0.1178
Computers	0.0381	0.0381
Female_Person	0.3514	0.4776
Instrumental_Musician	0.1253	0.2445
Landscape	0.4850	0.4850
Male_Person	0.8445	0.8379
Nighttime	0.0647	0.0647
Scene_Text	0.1033	0.1033
Singing	0.0531	0.0807
Sitting_Down	0.0015	0.0008
Stadium	0.0642	0.1653
Throwing	0.0553	0.0838
Walking_Running	0.3006	0.3006
MAP	0.1832	0.2213

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Improving (all) TRECVID SIN runs

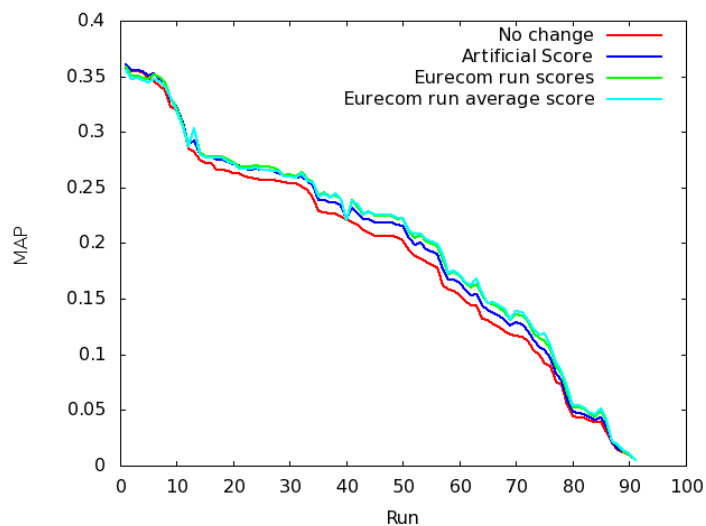
- We have the best 2000 shots for all runs of all participants, but...
- We do not have the scores
 - Artificial score from inverse rank :
$$\text{score} = \frac{100}{100 + \text{rank}}$$
 - Or use scores from other runs (ours)
- We do not have best shots after 2000
 - Just re-rank the first 2000

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Improving (all) TRECVID SIN runs



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Improving (all) TRECVID SIN runs

Run	Base	Score	Norm Score	InvRank
U_SIN_000000_000	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_001	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_002	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_003	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_004	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_005	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_006	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_007	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_008	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_009	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_010	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_011	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_012	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_013	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_014	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_015	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_016	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_017	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_018	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_019	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_020	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_021	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_022	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_023	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_024	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_025	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_026	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_027	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_028	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_029	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_030	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_031	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_032	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_033	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_034	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_035	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_036	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_037	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_038	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_039	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_040	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_041	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_042	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_043	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_044	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_045	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_046	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_047	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_048	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_049	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_050	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_051	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_052	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_053	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_054	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_055	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_056	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_057	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_058	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_059	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_060	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_061	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_062	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_063	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_064	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_065	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_066	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_067	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_068	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_069	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_070	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_071	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_072	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_073	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_074	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_075	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_076	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_077	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_078	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_079	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_080	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_081	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_082	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_083	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_084	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_085	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_086	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_087	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_088	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_089	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_090	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_091	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_092	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_093	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_094	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_095	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_096	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_097	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_098	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_099	0.2419	0.3098	0.3525	0.2705
U_SIN_000000_100	0.2419	0.3098	0.3525	0.2705

All Light task runs

No change	Inverse rank	Eurecom run scores	Eurecom run average score
19,14%	19,89%	20,29%	20,32%

Remember: we are just using the sorted list of the best 2000 shots, with no score, only half of the concepts are changed

Improving (all) TRECVID SIN runs

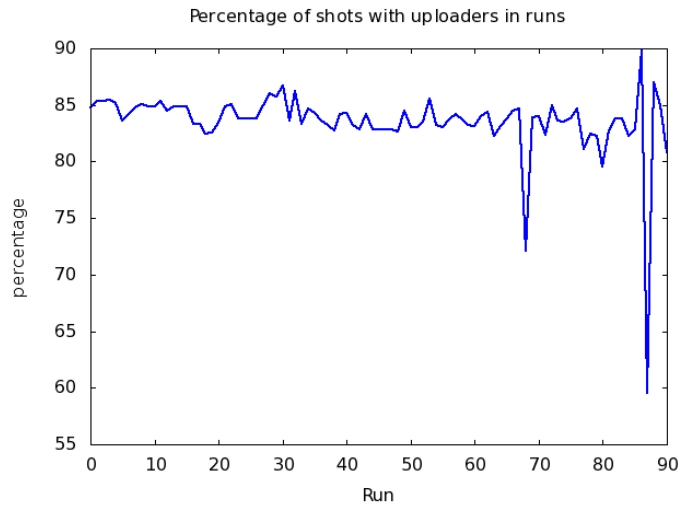
- Thanks to:
 - TokyoTech team
 - University of Amsterdam team
 - Aalto team

We got the full results (all scores for all shots in the test) for three runs (among the best ones)

Team	Run	Base	Score	Norm Score	InvRank
TokyoTechCanon	TokyoTechCanon2	0.3535	0.2419	0.3098	0.3525
UniversityOfAmsterdam	Sheldon_1	0.3457	0.2826	0.2826(0.3315)	0.3548
Aalto	PicSOM_1	0.2602	0.2377	0.2348	0.2705

We haven't found the good way to use the score (yet)

Do better runs implicitly use uploaders more ?

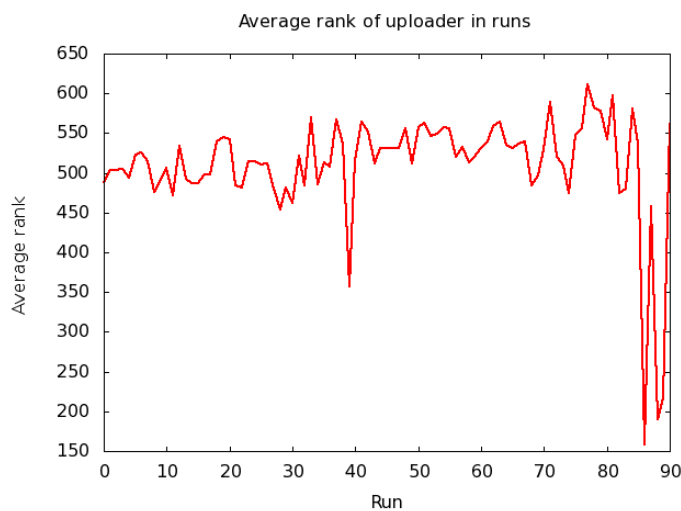


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Do better runs implicitly use better uploaders ?

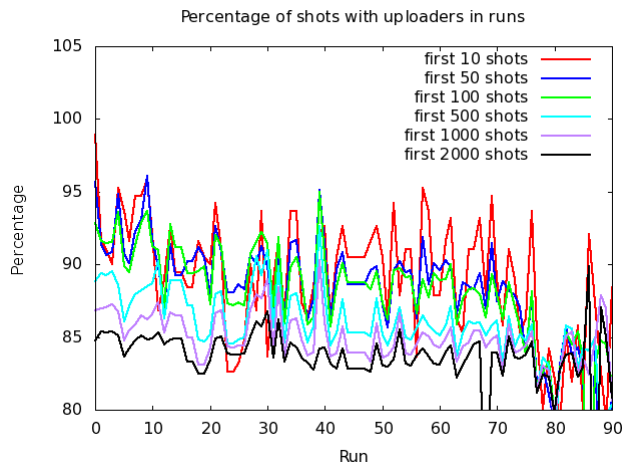


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Do better runs implicitly use uploaders more ?



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Conclusions

- **Correlation between concept and uploader**
- **If we want better TRECVID performance, use uploader model**
 - What is the best model ?
 - How to update scores ?
- **If we want better multimedia detectors, build dev and test collections with disjoint uploader sets**

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Thank you !



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