



**Selected Papers of #AoIR2018:  
The 19<sup>th</sup> Annual Conference of the  
Association of Internet Researchers**  
Montréal, Canada / 10-13 October 2018

## **STUDYING 'LIVE' CROSS-PLATFORM CIRCULATION OF IMAGES WITH A COMPUTER VISION API: AN EXPERIMENT BASED ON A SPORTS MEDIA EVENT**

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### **Introduction**

Understanding cross-platform circulation of web contents is one of the current challenges of digital methods-oriented research. While most studies still focus on specific sociotechnical practices enacted within platforms such as Facebook, Instagram or Twitter, scholars have highlighted the importance of going beyond what Rogers (2018) referred to as a "single-platform approach". According to Elmer and Langlois (2013, p.50), the transition from 'Web 1.0 studies' to Web 2.0 cross-platform methods reveals the importance of mapping 'traffic tags' that organize the online activity. Most of such studies focus on hashtags, "likes" and/or URLs as 'traffic tags', consolidating a "co-linked, inter-liked and/or cross-hashtagged" research design (Rogers, 2018). Aiming to expand this perspective, in this study we focus on the potential of visual digital objects – static images in particular – as traces of these connections.

Visual objects bear high potential to operate as 'traffic tags' due to their ubiquitous presence and their relative consistency across reproductions.. However, visual content is not retrievable through common querying mechanisms. Due to what Levin (2006) has referred to as the "computational opacity" of the visual, an image has to undergo several computational processes to become searchable. This is commonly defined as "reverse image search", and it has existed on the web for at least the past decade, with services such as TinEye or Google's "Search by image".

In this study, we experiment with a more recent development by employing Google Cloud Vision API – one of several cloud computing frameworks recently released for the analysis of visual content. Its Web Detection module, in particular, pairs typical

Suggested Citation (APA): D'ANDRÉA, C; MINTZ, A. (2018, October 10-13). *Studying 'live' cross-platform circulation of images with a computer vision API: an experiment based on a sports media event*. Paper presented at AoIR 2018: The 19<sup>th</sup> Annual Conference of the Association of Internet Researchers. Montréal, Canada: AoIR. Retrieved from <http://spir.aoir.org>.

computer vision operations with Google's search mechanism, partly performing as a more specialized batch reverse image search engine. Therefore, mediated by Google's "massive indexing machine" (Rogers, 2018), one could, potentially, retrieve some traces of an image's spread across the web.

In this paper, we experimentally pursue this goal by attempting to track the 'live' cross-platform circulation of images shared on Twitter in the context of 2018 FIFA World Cup Final Draw ceremony, held in Moscow on 1st December 2017. Through this empirical study, we aim to discuss the potentials and limitations of this non-verbal methodological approach.

## **Empirical study and analysis**

Considering that Twitter may be taken as an initial epicenter of online discussions regarding this kind of 'deep-mediatized' event (Coudry & Hepp, 2017), we extracted the images for our analysis from a dataset of 395,016 tweets collected during a three-hour period on the day of the ceremony. This data was retrieved through Streaming API using a set of multilingual hashtags (e.g. #2018WorldCup, #TirageauSort and #2018روسيا).

Following a novel methodological protocol, at predetermined intervals during data collection we extracted the list of most shared 'media uploads' - a sub-dataset generated by DMI-TCAT tool - and processed a range of them through Google Vision API. These iterations continued after the Twitter data collection for three weeks after the event. Through this process, we collected a time series of URL lists pointing to pages at which – at each moment – the Vision API was able to identify the presence of images matching those collected on Twitter.

Four images approached in depth in our study: two backstage photos which portray renowned veteran Brazilian player Pelé using a wheelchair, surrounded by fellow sportsmen, politicians and authorities. The other two pictures are "photo-based memes" (Shifman, 2014) directed at particular national publics: a photomontage featuring former Italian player Cannavaro made to tease Chilean team, which was not qualified for the World Cup; and a meme about the Arabic derby between Egypt and Saudi Arabia, which was defined by the draw (Figure 1).

The analysis observes the pictures' incidence both on known social media platforms and in the open web. In a first analytical effort, the domains were taken as identifiers of 22 social media platforms - occurrences of the tracked images were found in 11 of them. In a second analytical effort, the segment of URL syntax (i.e., ".br", ".uk" or ".jp") on the different top-level domains (TLD) was taken as a relevant marker for analyzing the national and regional circulation of the pictures, given that they are commonly attributed according to the web site's geographical location. In order to compare how the selected four popular images circulated on social media platforms and on the open web over time, streamgraph visualizations (Figure 2) were created, using RAWGraphs.



Figure 1: Pictures selected from the dataset for analysis.

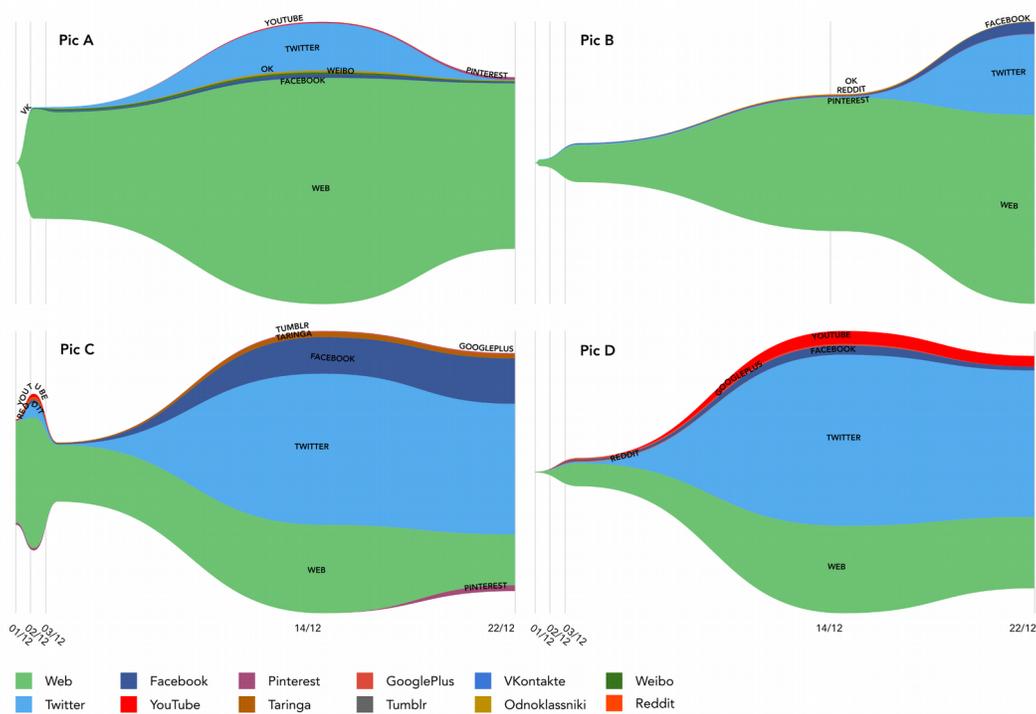


Figure 2: Streamgraphs for the URLs of pages with matching images categorized by social media platforms, over time. In left-right direction, top-row is relative to pictures A and B and bottom row is relative to pictures C and D. The vertical scale is not quantitatively comparable among the graphs. For each of them, it has been set to match the peak number of tracked occurrences to the height of the graph.

The empirical study thus provides a meaningful substrate for discussing the specificities of the live analytical procedures adopted (Marres & Weltevrede, 2013). Several aspects of the data may be attributed to Google Vision API's operation and, thus, highlight the issue of its opacity. Some of the most evident of those are: the seemingly counterintuitive decrease of the total number of URLs retrieved in some of the iterations, and the late indexation of the selected pictures on social media platforms (including Twitter occurrences). These seeming inconsistencies shed light onto Google Vision API's role as an active mediator in our methodological design as well as raises questions regarding the implications of applying it in this kind of research.

Thus, taking such cautions, there are several takeouts from this study's empirical findings, such as the possibility of going beyond language barriers and mainstream platforms in a cross-platform study. The live reverse image search allowed the observation of highly different contexts of internet use otherwise difficult to reach from the perspective of the researchers. The presence of regionally-oriented social media platforms such as Weibo (China), VK (Russia) and Taringa (South America) and the occurrences of some specific top-level domains among open web occurrences can be pointed as the most significant examples of how geographically situated and politically oriented was the circulation of some of the pictures related to the World Cup Final Draw.

## References

- Couldry, N., & Hepp, A. (2017). The continuing lure of the mediated centre in times of deep mediatization: Media Events and its enduring legacy. *Media, Culture & Society*, 40(1), 114-117.
- Elmer, G., & Langlois, G. (2013). Networked campaigns: Traffic tags and cross platform analysis on the web. *Information Polity*, 18(1), 43–56.
- Levin, G. (2006). Computer vision for artists and designers: pedagogic tools and techniques for novice programmers. *AI & SOCIETY*, 20(4), 462–482.
- Marres, N., & Weltevrede, E. (2013). Scraping the Social? Issues in live social research *Journal of Cultural Economy*, 6(3), 313–335.
- Rogers, R. (2018). Digital methods for cross-platform analysis. In J. Burgess, A. Marwick & T. Poell (eds.) *The sage handbook of social media* (pp.91-108). London: SAGE.