

LiveSync: a Tool for Real Time Video Streaming Synchronization from Independent Sources

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Abstract. This work presents a tool that allows users to synchronize live videos from multiple sources such as YouTube or any other video streaming sources. The proposed approach to proceed the multiple camera video synchronization is based in crowdsourcing techniques, using the power of a crowd of collaborators to synchronize videos, requiring from each user the sync of only a pairs of videos. Additional sync relations are inferred from the known contributions, using transitivity properties and an appropriate structure for this inference, the Dynamic Alignment List.

Categories and Subject Descriptors: H.4.4.3 [Information Systems Applications]: Crowdsourcing; H.3.2.7 [Human-Centered Computing]: Synchronous editors

Keywords: live video, synchronization, crowdsourcing

1. INTRODUCTION

This paper extends the previous work [?] that won the prize of best tool in the XVI Workshop on Tools and Applications (WFA) of the XXII Brazilian Symposium on Multimedia and Web Systems (WebMedia 2016).

Multiple camera video synchronization is a research area within multimedia. Automatic video synchronization (AVS) is a form to synchronize multiple video streams. AVS can be done analysing video segments [?] or audio ones [?]. In Schweiger et.al.[?] we find these and other approaches in the area. One main contribution of this paper is the description of the challenges for automatic synchronization algorithms: wide baselines, camera motion, dynamic backgrounds and Occlusions.

We propose in this work the use of crowdsourcing techniques to synchronize these videos, instead of an automatic one. Crowdsourcing[?] in our scope refers to the use of the crowd as part of a computational problem that can be solved easily by a human than by a machine. The "easily" word can mean that the human approach: is cheaper, faster or can be done more efficiently by humans.

In video synchronization, we know that humans can fulfil all challenges presented by [?]. A person can identify if two videos are synchronized or not independently of occlusions, change of the background, camera motion or view point changes. The main challenge is how to use the human abilities to synchronize the videos, and permit that other persons can benefit from these contributions. So our tool uses the power of the crowd to synchronize live streaming videos and provide a form that other persons that want to watch those videos can receive both videos and synchronization info.

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2. APPROACH

(3) Apresentação da solução proposta - métodos/técnicas/processos usados, arquitetura, componentes, fluxo de informações, resultados gerados

* Mostrar porque os métodos automáticos teriam problemas com isso e que a solução via crowd é viável nesse momento

* Mostra-se a solução proposta por Ricardo em 2015 (Remote Couplers), com descrição dela e da arquitetura.

3. SOLUTION

(4) Estudos de caso e/ou avaliações da solução, comparando com outras existentes (1/2)

* Faz-se então uma instância da solução para sincronizar vídeos em crowdsourcing.

* Explicando-se como as contribuições são armazenadas no Remote Coupler, fala-se da DAL, etc, etc.

4. STUDY CASES

(4) Estudos de caso e/ou avaliações da solução, comparando com outras existentes (2/2)

* Terminar com os estudos de caso: (1) o que já foi publicado e filmado e (2) uma simulação.

5. FINAL REMARKS

(5) Conclusão, limitações, trabalhos futuros.

REFERENCES