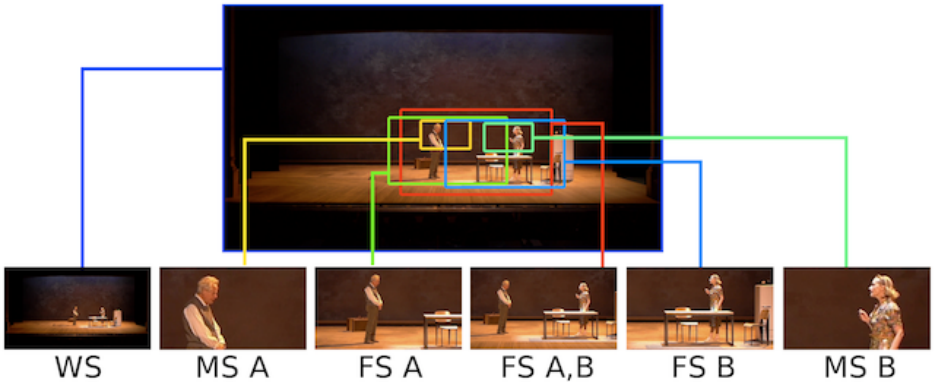
Automatic video editing of live performancess



Advisor

Rémi Ronfard, IMAGINE team, INRIA, Univ. Grenoble Alpes, LJK.

Email: remi.ronfard@inria.fr

Context

This internship is a continuation of a previous project at INRIA on automatic generation of cinematic rushes from ultra high definition video recordings of live performances [1]. Here, we would like to propose techniques to automatically make a fully edited movie from the generated rushes, based on an analysis of the script of the performance and a formalization of the rules of film editing.

Objectives

The goal of the internship will be to adapt the optimization-based approach we proposed in previous work for automatically creating well-edited movies from a 3D animation [2]. The proposed framework uses dynamic programming to minimize, under a semi-Markovian hypothesis, the errors made along three criteria: the quality of the shots (with respect to the unfolding actions), the respect of continuity editing rules, and the respect of a well-founded model of rhythm (cutting pace).

The same model is applicable to live-action video because the quality of the shots and cuts were carefully designed to take into account only measurable qualities in camera screen coordinates, which can be obtained with video analysis. The main difference to be worked out during the internship is that those measurements may be unreliable in the case of live-action video, due to tracking and video analysis errors. We will propose a probabilistic version of our algorithm, and tools to solve them using Viterbi decoding.

The internship will use existing annotated video rushes of live performances recorded by our lab as a proof of concept for the proposed methodology. The recent work of Leake et al. [3] will be used as a baseline for experimental validation. If successful, the internship is likely to lead to a PhD thesis on the same topic.

References

[1] Vineet Gandhi, Rémi Ronfard, Michael Gleicher. Multi-Clip Video Editing from a Single Viewpoint. CVMP 2014 - European Conference on Visual Media Production, Nov 2014.

[2] Quentin Galvane, Rémi Ronfard, Christophe Lino, and Marc Christie. Continuity Editing for 3D Animation. In AAAI Conference on Artificial Intelligence, AAAI Press, Austin, Texas, United States, January 2015.

[3] Mackenzie Leake, Abe Davis, Anh Truong, and Maneesh Agrawala. Computational video editing for dialogue-driven scenes. *ACM Trans. Graph.* 36, 4, July 2017.