Extracting automatically social signals from psychotherapy sessions

Thomas Gargot[1,2,*], Giovana Varni[2], Jonathan Aigrain[2],
Mohamed Chetouani[2], Michel Spodenkiewicz[1,2], David Cohen[1,2]
1. Hôpital de la Pitié Salpêtrière, 2. Institut des Systèmes Intelligents et de la Robotique, Paris, France
* thomas_gargot@hotmail.com

Introduction and motivation

Psychotherapy is an important part of treatment of mental disorders alone or complementary with pharmacotherapy. Some techniques are now widely evidence-based and very cost effective (Layard & Clark, 2014).

Most of the studies are indirectly based on patient reported outcomes or problematic behaviors that are evaluated before and after the psychotherapy. Unfortunately, studies hardly control what is directly happening during psychotherapy, especially the interaction between the patient and the therapist that could be a predictor of the psychotherapy efficacy. Consequently, it is difficult to make precise links between theory and practice, control its application and understand which of its ingredients are the most important.

It is yet possible to annotate manually videos. However, this task is challenging since it can be either very repetitive (annotation of turn-taking or non-verbal behavior) or very technical (annotation of application of some specific techniques like in motivational interviewing (Moyers et al, 2015).

In the future, an automatic feedback of the psychotherapy could also even help a therapist, to guide him to reorganize a treatment.

Towards an automated research framework

Here we suggest a research framework (Fig 1.) to extract automatically social signals from psychotherapy videos. We focused on motor synchrony since it was found to be a predictor of psychotherapy outcome in a first study (Ramseyer, 2011) and a relevant signal on the study of mother-child interaction. Varni et al. 2015 developed the SyncPy open source python library to help researchers and practitioners to automatically analyse synchrony. It could be possible to measure synchrony even in familial therapies. Other features could be quite easily extracted manually like direction of the body, gaze direction or smiles. Here, we show an example of a video before and during a conflict between a girl and her father (Fig 2. and 3.).

Using an interdiciplinary and open science approach, we developed some modules toward this goal that could be freely and easily re-used by other teams in other databases or with other modules.

Future work

The next step would be to design a specific database anticipating some technical problems (speech segmentation, overlapping of subjects, micro-movements) and define more precisely different conditions of psychotherapy that could be contrasted.
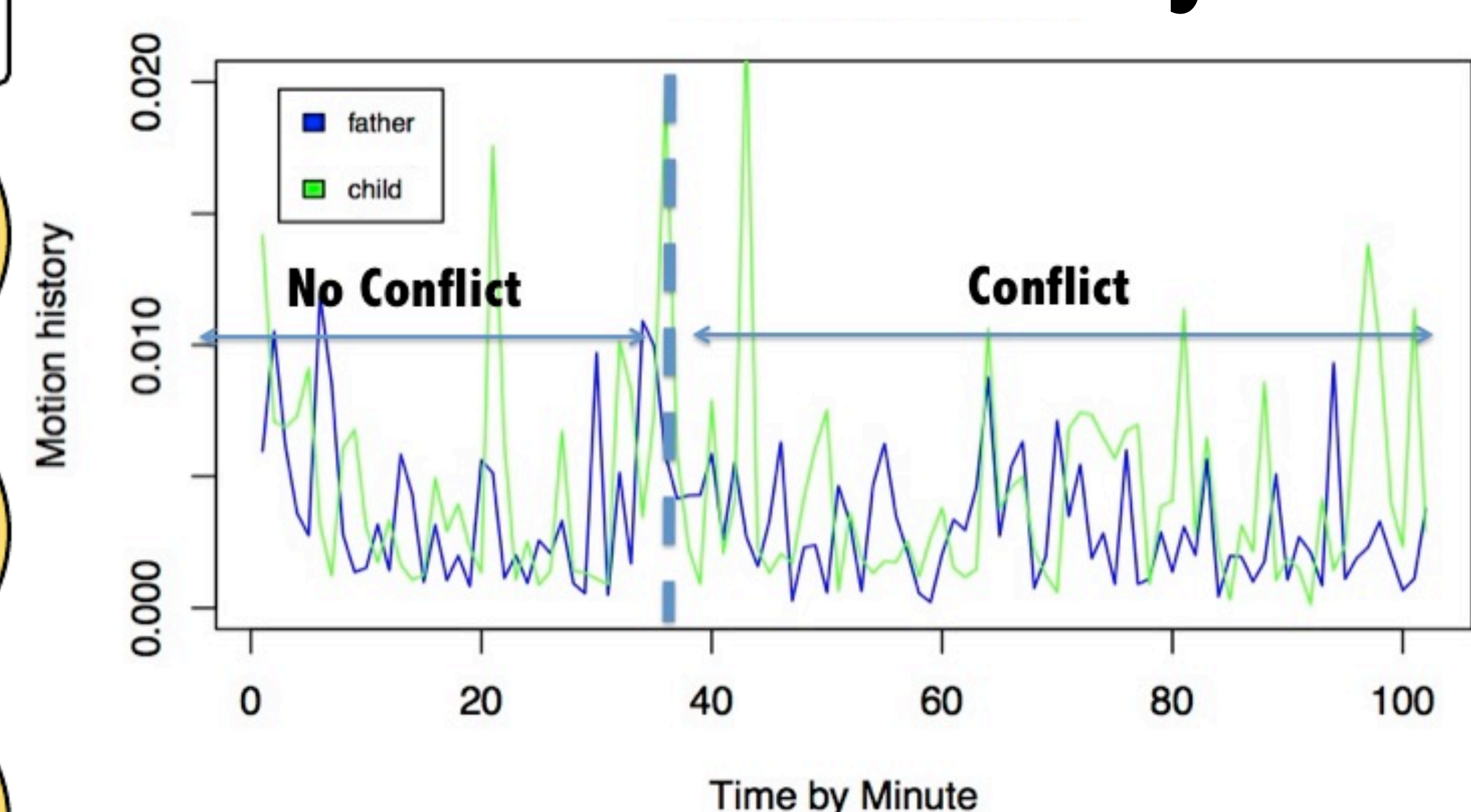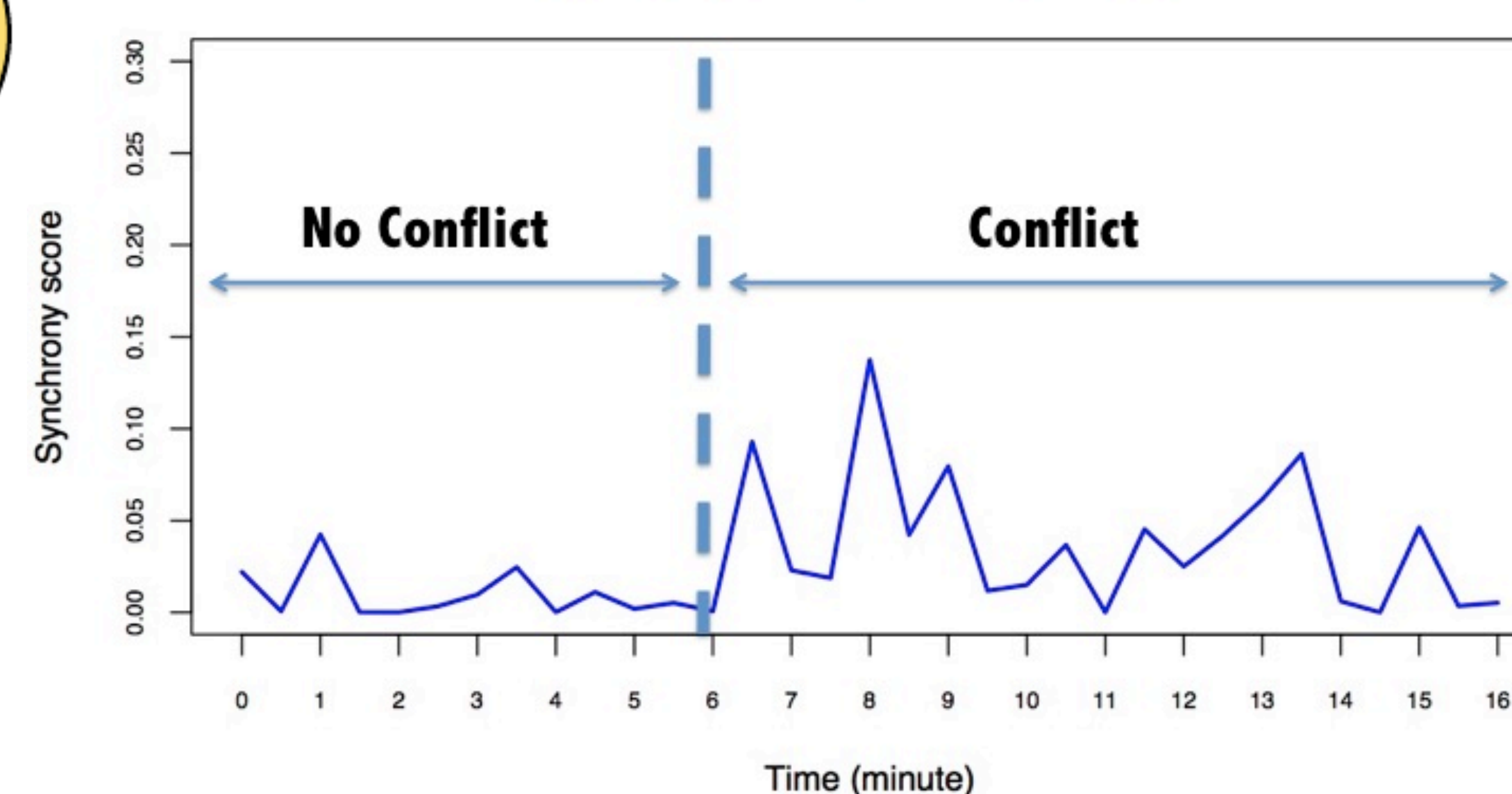
Project website

1. Procedure
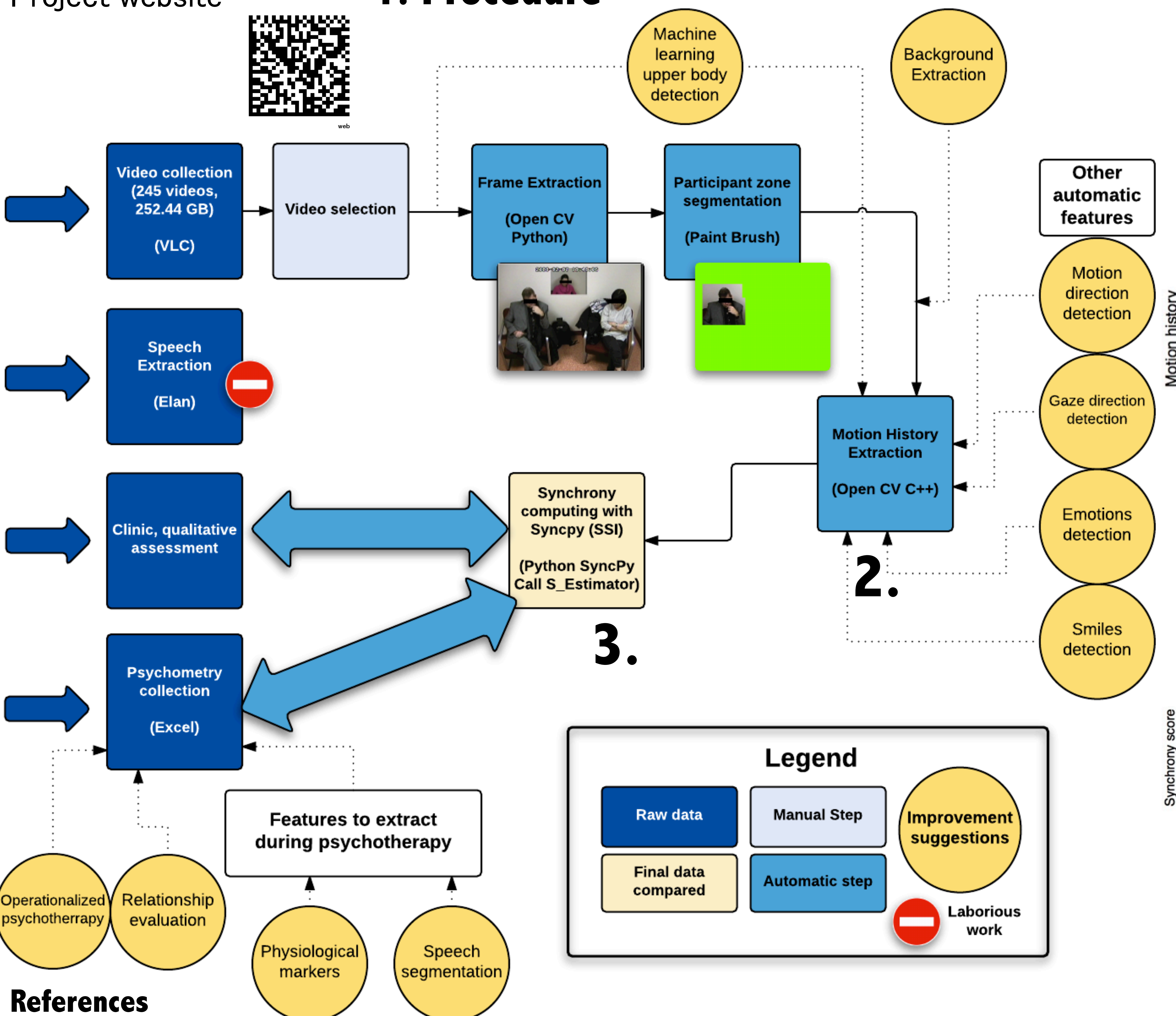
Example on a conflict video

2. Motion history

3. Synchrony score

References

Layard, R., & Clark, D. M. (2014). *Thrive: The power of evidence-based psychological therapies*. Penguin UK.

Moyers, T. B., J. K. Manuel, and D. Ernst. "Motivational Interviewing Treatment Integrity Coding Manual 4.1." (2014).

Ramseyer, Fabian, et Wolfgang Tschacher. « Nonverbal synchrony in psychotherapy: Coordinated body movement reflects relationship quality and outcome ». *Journal of Consulting and Clinical Psychology* 79.3 (2011): 284-295.

Varni, G., et al. "SyncPy: a Unified Open-source Analytic Library for Synchrony." *Proceedings of the 1st Workshop on Modeling INTERPERsonal SynchrONy And infLuence*. ACM, 2015.

No potential conflicts of interests