Master Thesis Project
Robust real-time camera tracking

Background:

Matchmoving, also referred to as video tracking or camera tracking, is a technique that allows 3D computer graphics to be inserted into a live video stream, to provide in view information or in other ways to enhance the visual experience. In addition to increased use in film and commercial productions, matchmoving finds daily usage in sports broadcasts and it is a necessity for augmented reality applications.

This project is performed in collaboration with Protracer AB, the world-leading provider of ball tracking technology. Products include real-time analysis and graphics for TV broadcasts as well as personalized training feedback and gaming experience for golf ranges around the globe.

Project description:

To evaluate different methods for matchmoving and to implement (presumably with the aid of publicly available libraries, such as OpenCV) a system for live camera tracking. An example of how such tracking may look can be found at https://www.youtube.com/watch?v=2Vwt4q8vJ5g . Methods should aim to be applicable for real-time use, but focus will be more on theory and robustness and precision of methods, than on fast GPU implementations.

The thesis work should include

- A survey of relevant literature and selection of one or two state-of-the-art methods.
- Planning of implementation and evaluation.
- Prototype implementation (e.g. in Matlab) and offline quantitative evaluation of the method(s).
- Improved implementation of selected method and live testing and evaluation.
- Writing of the thesis report.

Conditions:

Good experience of programming is a requirement. Knowledge of computer graphics, image analysis and/or computer vision is a plus.

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