מכון ויצמן למדע

THE WEIZMANN INSTITUTE OF SCIENCE

FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Vision and Robotics Seminar

Room 1 ,Ziskind Building
on Thursday, Dec 04, 2014
at 12:00

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Extended Lucas-Kanade Tracking

Abstract:

Lucas-Kanade (LK) is a classic tracking algorithm exploiting target structural constraints thorough template matching. Extended Lucas Kanade or ELK casts the original LK algorithm as a maximum likelihood optimization and then extends it by considering pixel object / background likelihoods in the optimization. Template matching and pixel-based object / background segregation are tied together by a unified Bayesian framework. In this framework two log-likelihood terms related to pixel object / background affiliation are introduced in addition to the standard LK template matching term. Tracking is performed using an EM algorithm, in which the E-step corresponds to pixel object/background inference, and the M-step to parameter optimization. The final algorithm, implemented using a classifier for object / background modeling and equipped with simple template update and occlusion handling logic, is evaluated on two challenging data-sets containing 50 sequences each. The first is a recently published benchmark where ELK ranks 3rd among 30 tracking methods evaluated. On the second data-set of vehicles undergoing severe view point changes ELK ranks in 1st place outperforming state-of-the-art methods. Joint work with Shaul Oron (Tel-Aviv University) and Aharon Bar-Hillel (Microsoft).