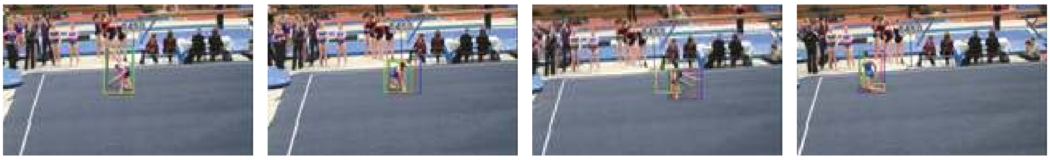
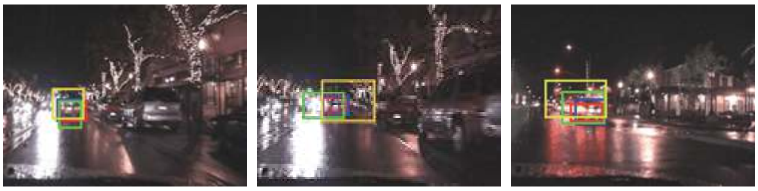
和 KCF 网络, 本文在 SiamFC 网络中引入 DPP 池化层和残差网络能很好保留数据集上的细节特征, 提升在追踪任务中的准确度, 但在综合的任务数据集中稳定性还需提高.

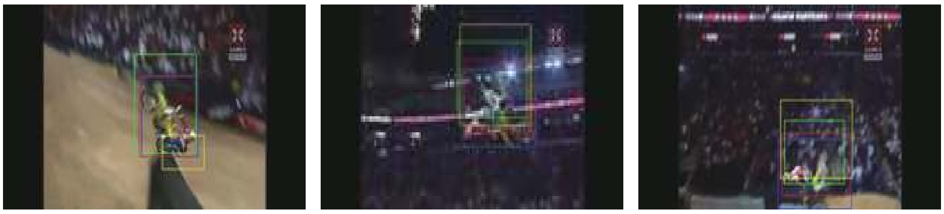


(a) 体操运动第一帧　(b) 体操运动第二帧　(c) 体操运动第三帧　(d) 体操运动第四帧



(e) 夜间车辆第一帧　(f) 夜间车辆第二帧　(g) 夜间车辆第三帧

图 6　groundtruth(蓝色)、DPP-SiamFC(红色)、KCF(相关滤波算法黄色) 和 SiamFC(绿色) 在目标变形和背景复杂条件下的追踪图像



(a) 飞车表演第一帧　(b) 飞车表演第二帧　(c) 飞车表演第三帧

图 7　groundtruth(蓝色)、DPP-SiamFC(红色)、KCF(相关滤波算法黄色) 和 SiamFC(绿色) 在摩托车特技比赛中的对比

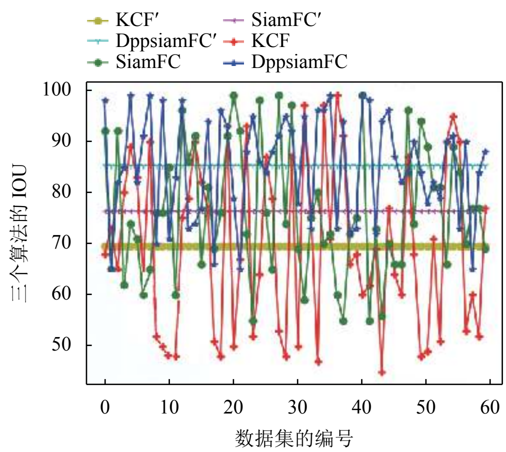


图 8　SiamFC、DPP-SiamFC 和 KCF 的 IOU 比较

4　结论与展望

实验结果证明, 通过在 SiamFC 孪生网络上引入 DPP 池化层和残差网络, 有利于网络细节特征的保留, 在 VOT2017 追踪数据集中 DPP-SiamFC 有更高精确度, 同时在背景复杂、物体变形、快速移动、遮挡等数据集中目标追踪有一定改善. 但是在多重任务追踪集的效果还有待提高. 今后我们的工作将致力于网络与数据集之间的对抗性研究.

表 2　SiamFC、DPP-SiamFC 和 KCF 精度比较 (单位: %)

算法	Siamfc	DPP-SiamFC	KCF
60 个数据集平均精度	78	87	70

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