CSE 252C Project Proposal

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1 Introduction

This project aims re-implement Struck, an state of art visual paper using adaptive tracking by detection. The rest of this document will list the milestones we hope to meeting in the next few weeks and some questions we hope to answer by the end of the project.

2 Milestones

In this section, we set 5 milestones that we will keep tracking when implementing the project.

1. Feature Extraction
   We will use Haar feature to detect the initial position of the object. The Haar feature extraction code will be implemented no later than May 7th, 2017.

2. Gaussian Kernels
   By May 7th, 2017, we will implement the Gaussian kernel which corresponds to the Haar feature we use.

3. LaRank
   We will use LaRank approach, which is an SVM solver based on the sequential minimal optimization(SMO), to perform online optimization the the SVM. The LaRank algorithm will be implemented by May 17th, 2017.

4. Budget Maintenance
   The budget maintenance mechanism is used to prevent the so-called "curse of kernelization", which is the unbounded growth of the number of support vectors. We will implement this mechanism no later than May 21st, 2017.

5. Multi-Kernels
   We will investigate into multi-kernel learning, as well as feature selection, to improve the tracker's performance. The investigation will be done by May 31st, 2017.

3 Questions

In this section, we will list 6 questions which will be answered during the implementation of this project.

1. Why is Struck expected to be better than previous methods?

2. What is Struck's time and space complexity, and scalability?

3. What method should be used to evaluate tracking accuracy?

4. How much better does Struck perform compares to previous methods?

5. What are the limitations of Struck?

6. What are potential ways to further improve Struck's performance?

4 Experiments

Our project will use OpenCV 2.4.13 and Eigen 3.2.8 to build our model. The tracking will be performed on sequences of images, which are available in the dataset of Visual Tracker Benchmark[8].

References

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