

SIFT based Object Tracker

Vijay Harid
EE 368 Final Project

Introduction

Object tracking requires correctly identifying a region of interest in consecutive frames of a video sequence.

Numerous applications:

Security

- Person tracking for security/military surveillance

Scientific

- Planetary body trajectory tracking from astronomical observations

Medical

- Tracking motion of possible internal blood clots to aid in surgery

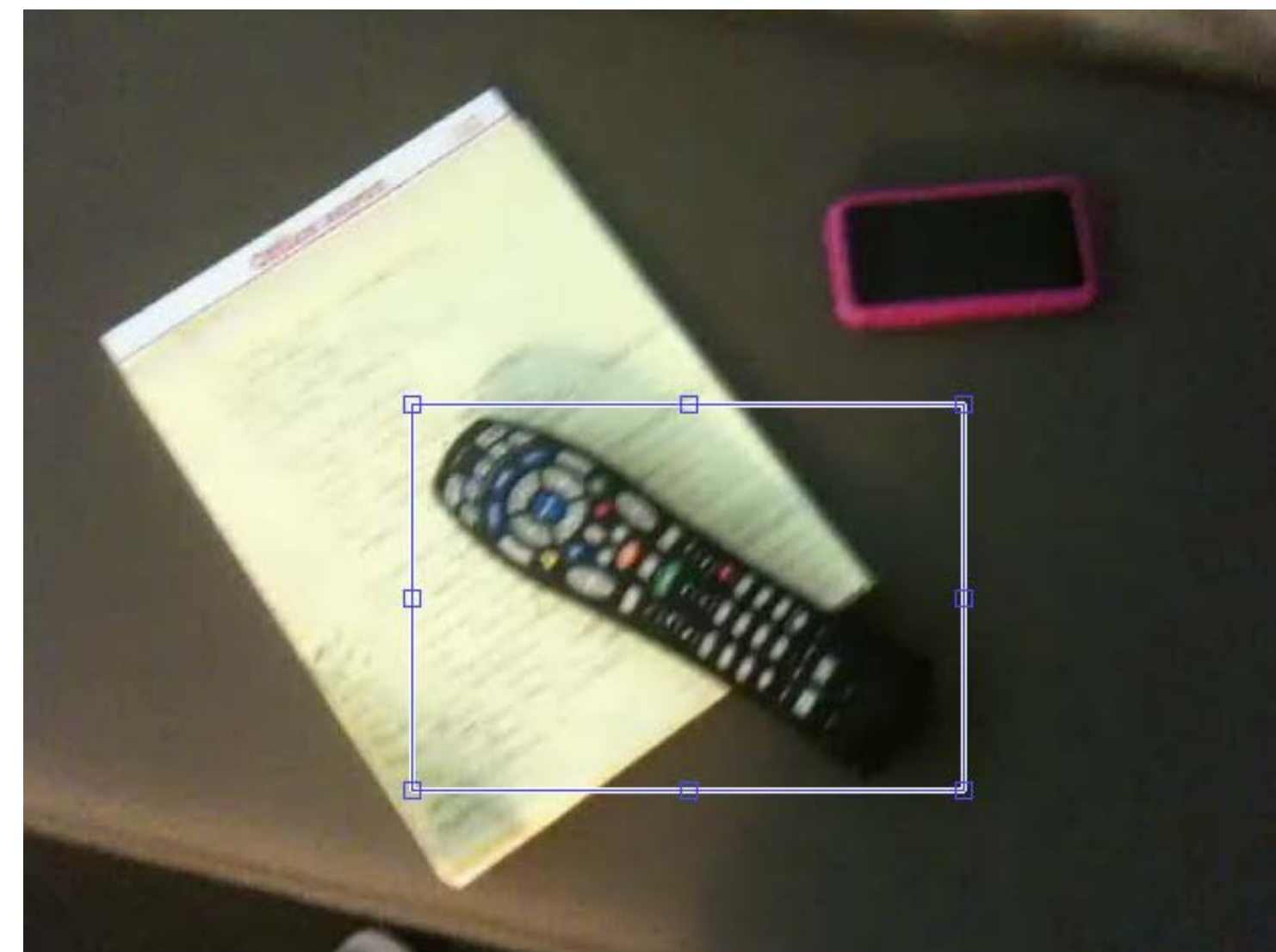
Entertainment

- Follow the trajectory, in real-time, of a football or baseball during a sports game

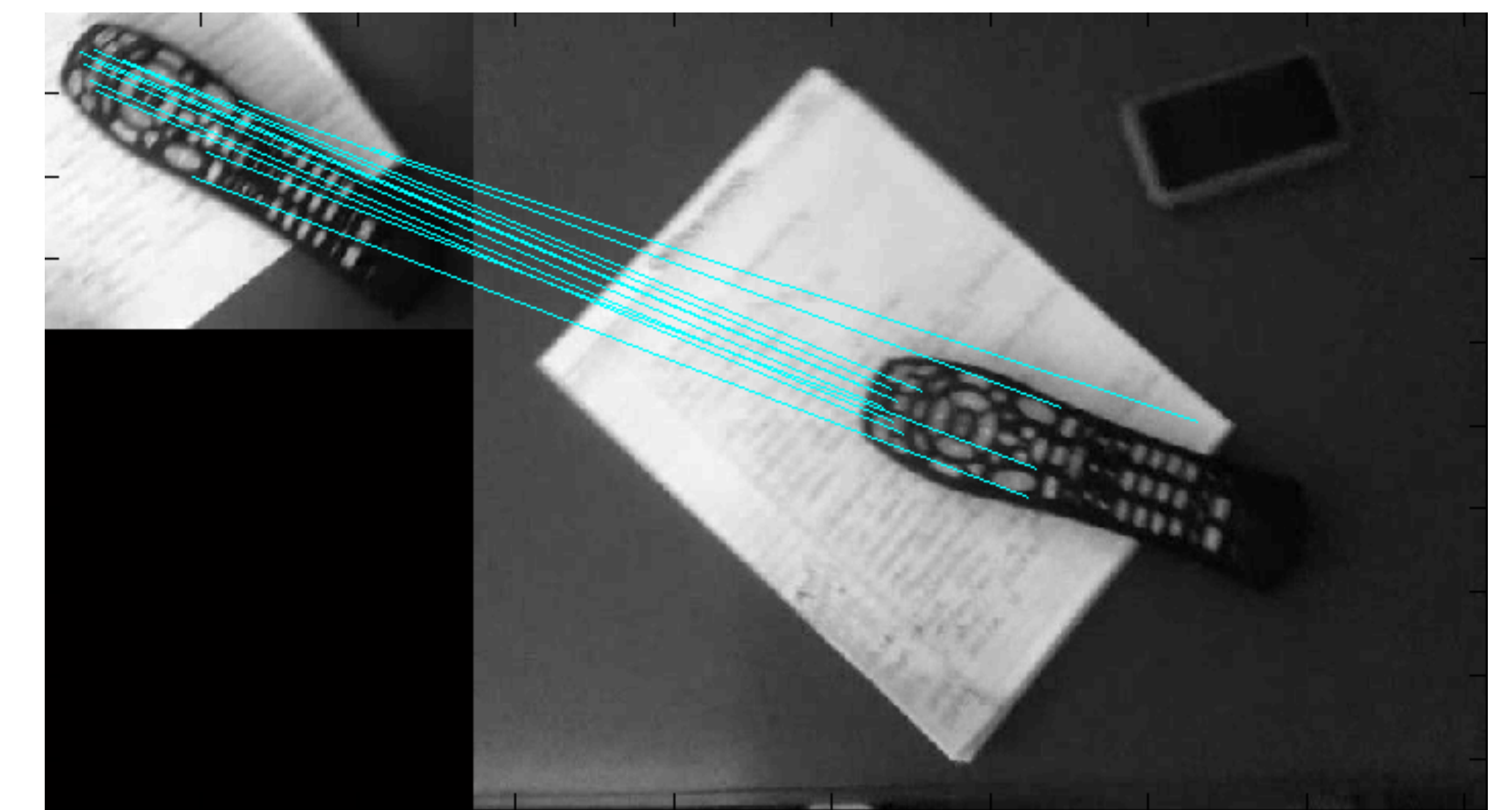


Object tracking algorithm

User selects region (template):



Keypoints found using SIFT detector:

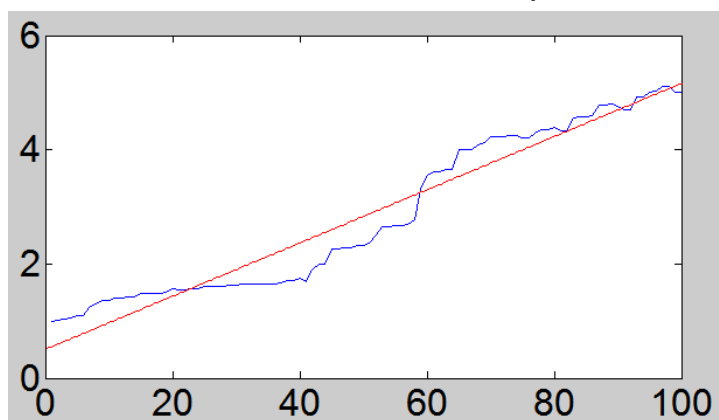


Experimental Results

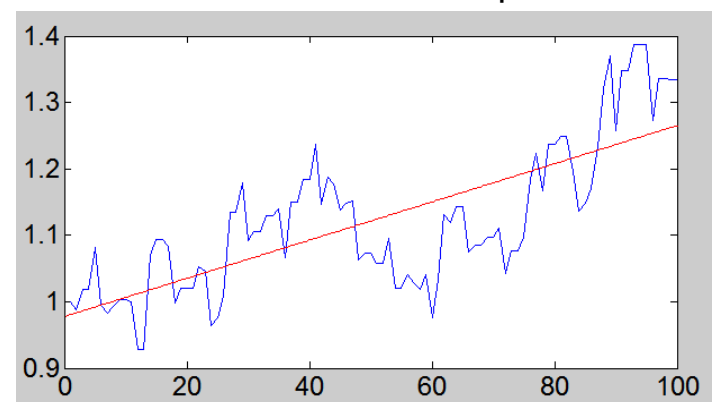
“Enlargement drift” occurs when template is updated, and tends to accumulate as video sequence evolves. This can be compensated for by periodically decreasing box area.

Results most accurate when template is not updated and when deformation of object is not too drastic.

Normalized area before compensation



Normalized area after compensation



Block Diagram of tracker:

