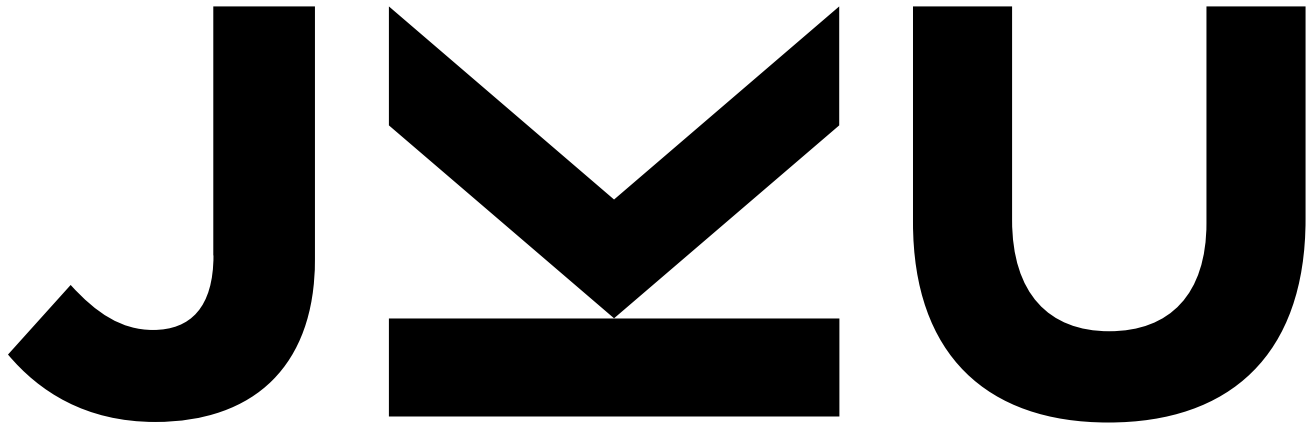
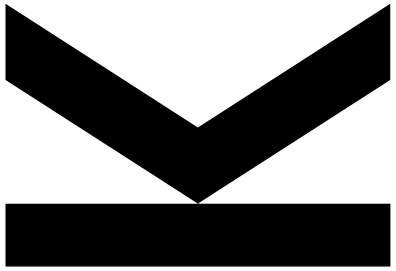

JOHANNES KEPLER
UNIVERSITY LINZ

INTRODUCTION TO SEMINAR PROJECT



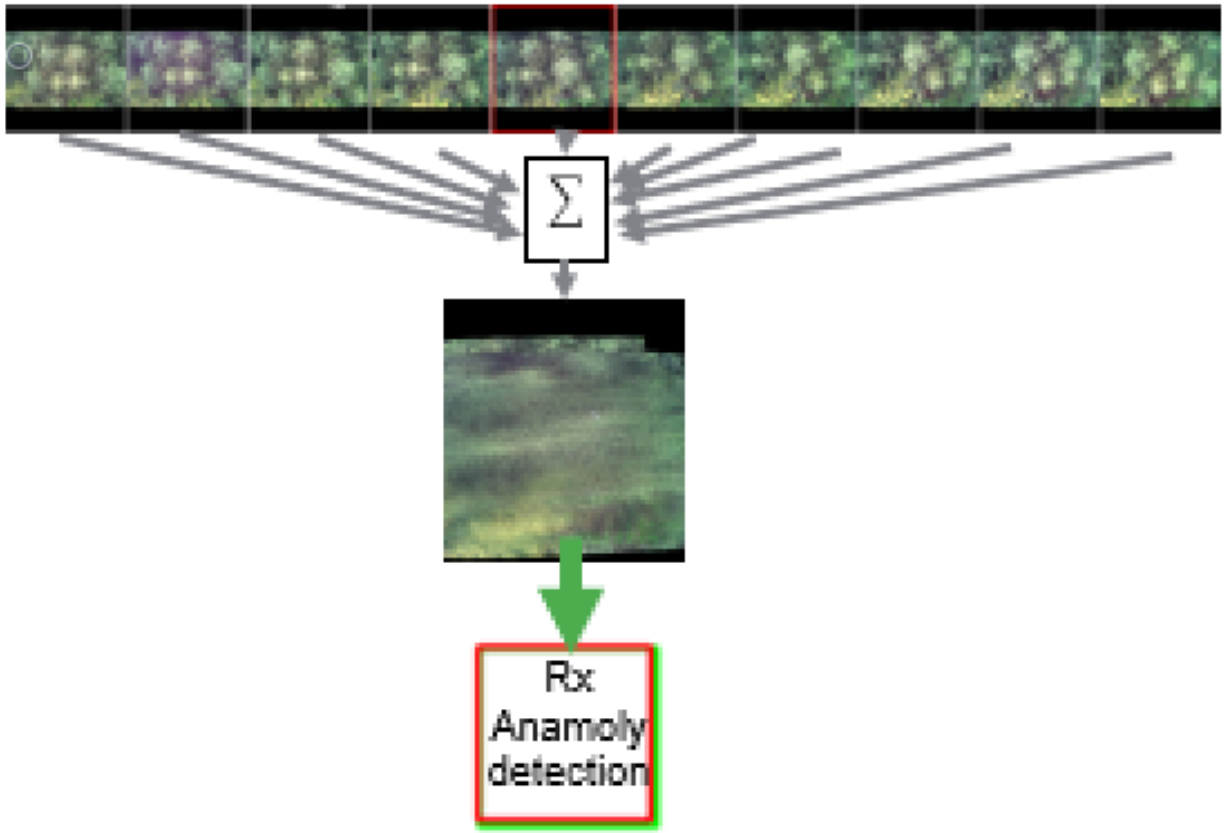
Team B0:
Philipp Eberstaller
Dominik Heindl
Carson Wittwer
Hasan Alper Yaprak

CONTENTS

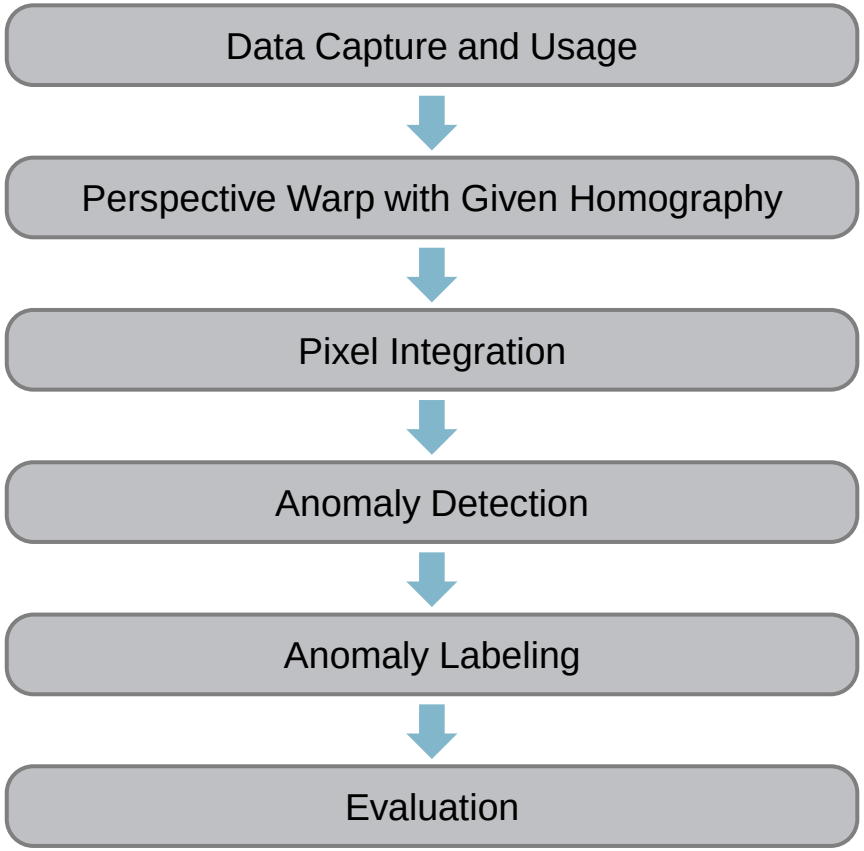
CONTENTS

PROBLEM DEFINITION

- Presented Problem:
  - Object(People) detection, via drone aerial photography, given strong occlusion
- Given Solution:



Given Algorithm

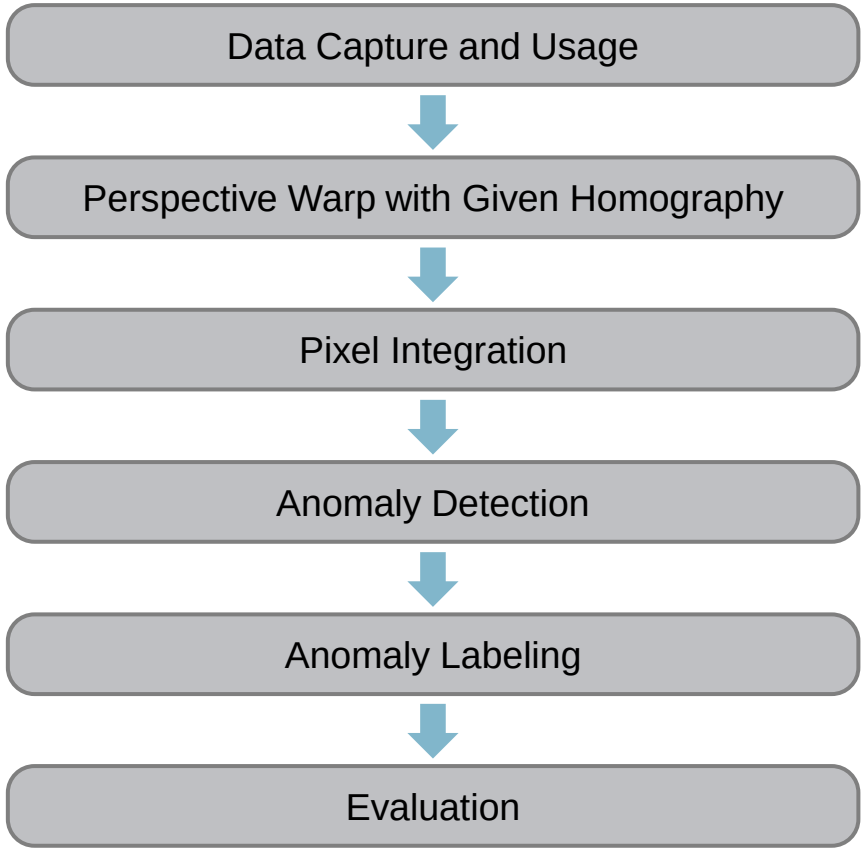


PROBLEM DEFINITION

- Presented Problem:
  - Object(People) detection, via drone aerial photography, given strong occlusion

- Given Solution:

Given Algorithm



Project Objective

Learn

Learn about the subject, implement topics, and gain practical education

Fail

Failures provide opportunity to learn and improve

Improve

Improve on both the given solution and our knowledge

Constraints:

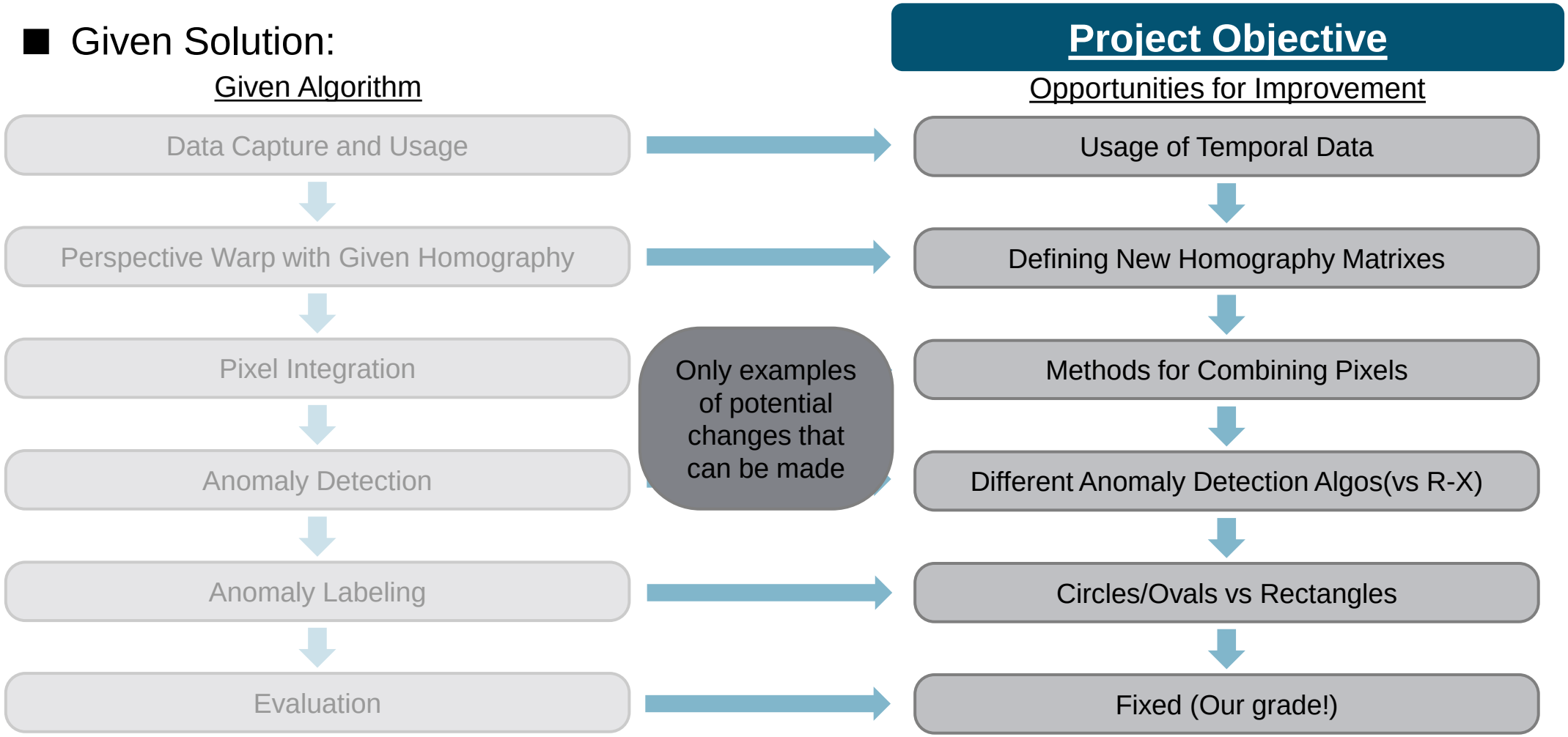
- Provided dataset of temporal images
  - 10 cameras, 7 frame sequence
- Unsupervised algorithms
- Defined evaluation criteria
  - Precision & Recall -> Average Precision(AP)

CONTENTS

OPPORTUNITIES FOR IMPROVEMENT

- Presented Problem:
  - Object(People) detection, via drone aerial photography, given strong occlusion

- Given Solution:

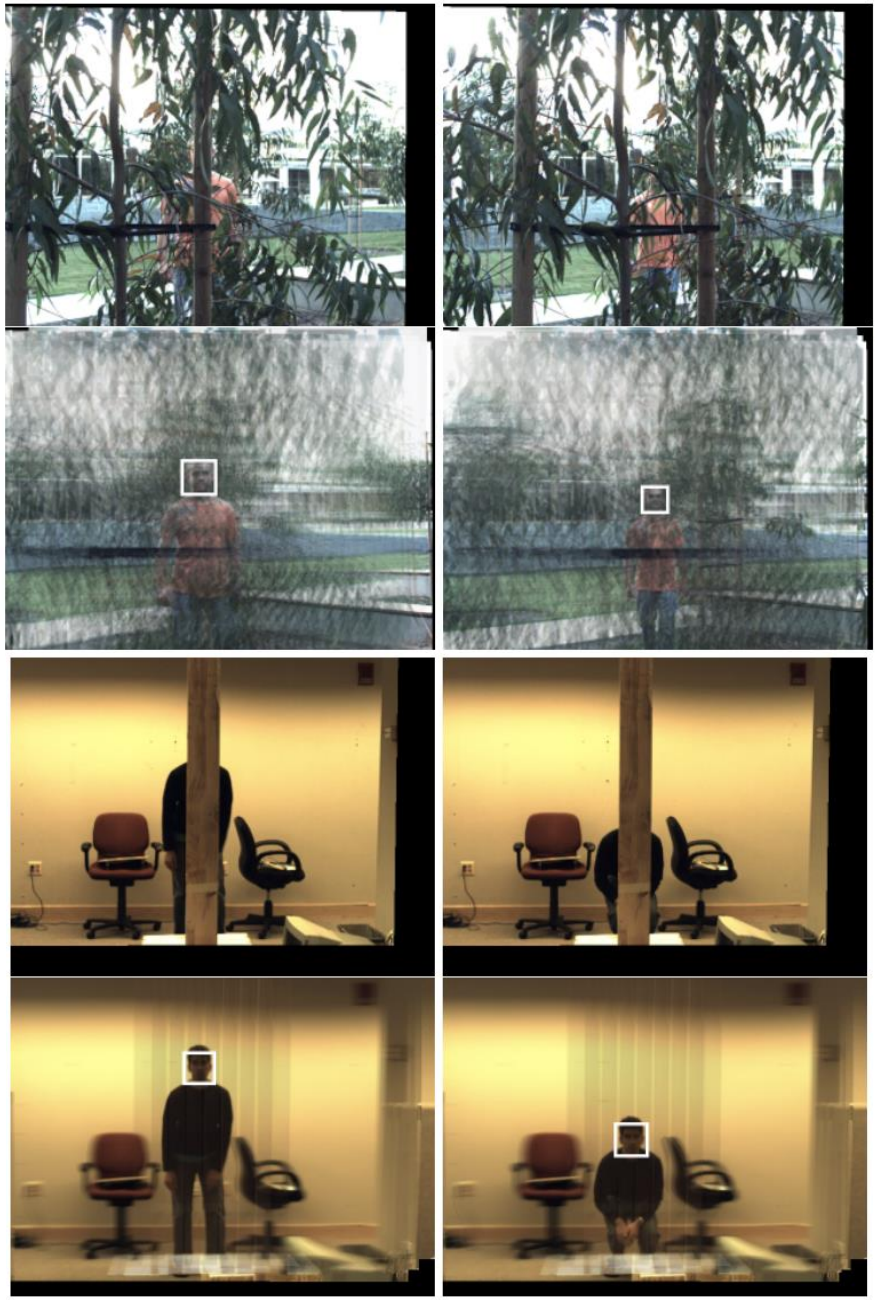


CONTENTS

RELEVANT ACADEMIC PAPERS

“Synthetic Aperture Tracking: Tracking through Occlusions”

- This method tries to deal with larger occlusions and works even if all viewpoints have some occlusion.
- It detects occlusions in each frame individually before matching and combining the images.
- It does the occlusion detection and matching by transforming the image-data into a eigenspace.



N. Joshi, S. Avidan, W. Matusik and D. J. Kriegman, "Synthetic Aperture Tracking: Tracking through Occlusions," *2007 IEEE 11th International Conference on Computer Vision*, 2007, pp. 1-8, doi: 10.1109/ICCV.2007.4409032.

JKU

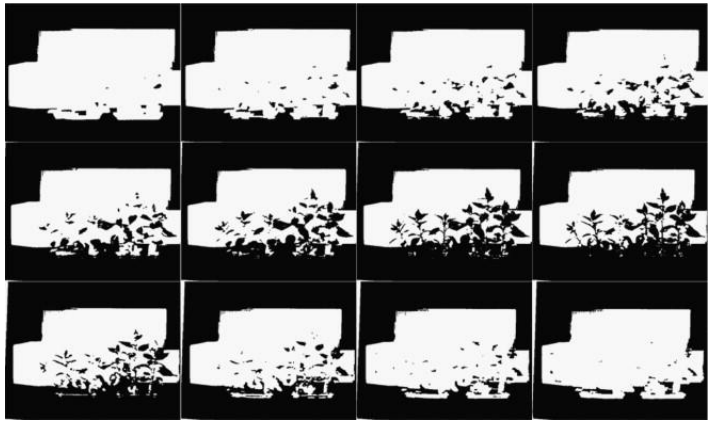
RELEVANT ACADEMIC PAPERS

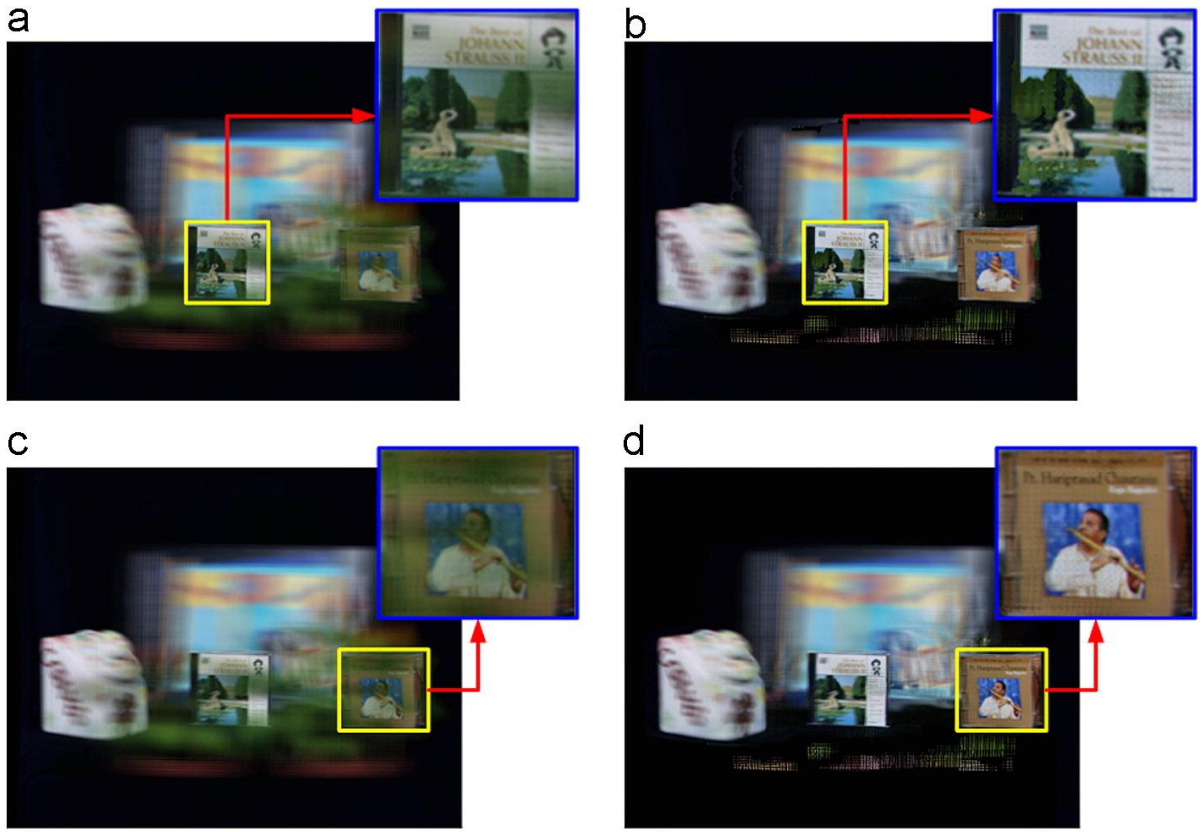
Methods for Combining Pixels

"Synthetic aperture imaging using pixel labeling via energy minimization"

Summary of Relevant Topics:

- The paper proposes a methodology to improve the resulting image in synthetic aperture image
- Every pixel is assigned a label using the framework of minimizing an energy function
- The energy function is a combination of a data term and smoothness term
- Labels are created at different depth planes and merged





Zhao Pei, Yanning Zhang, Xida Chen, Yee-Hong Yang"Synthetic aperture imaging using pixel labeling via energy minimization". Pattern Recognition, Volume 46, Issue 1, 2013, Pages 174-187, ISSN 0031-3203, https://doi.org/10.1016/j.patcog.2012.06.014.

RELEVANT ACADEMIC PAPERS

"Reducing Anomaly Detection in Images to Detection in Noise"

Summary of Relevant Topics:

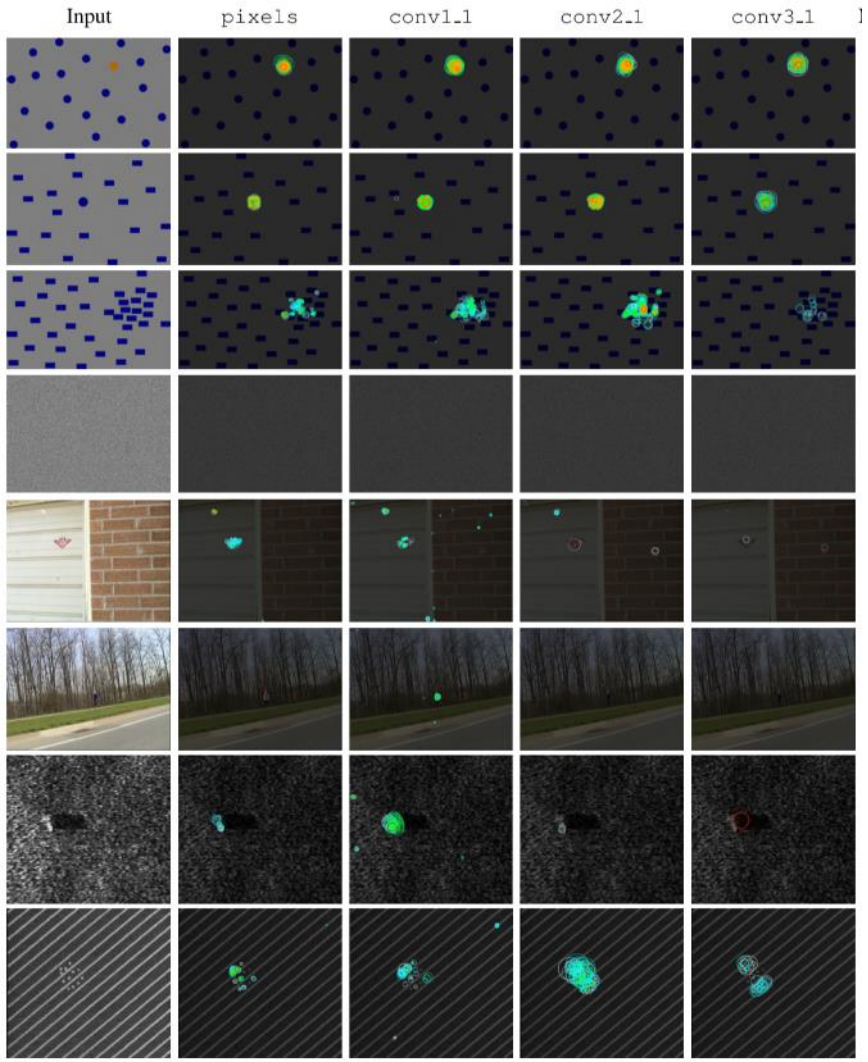
- Convert background modeling to a noise modeling problem
  - anomaly detection in noise is easier

- Apply algorithm on a *residual* image
  - residual = difference between self-similar version of original image and original image

- Use of statistical test to find non-repeating regions of an image

A. Davy, T. Ehret, J. Morel and M. Delbracio, "Reducing Anomaly Detection in Images to Detection in Noise," 2018 25th IEEE International Conference on Image Processing (ICIP), 2018, pp. 1058-1062, doi: 10.1109/ICIP.2018.8451059.

Different Anomaly Detection Algos(vs R-X)



QUESTIONS?