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CV Lab Project

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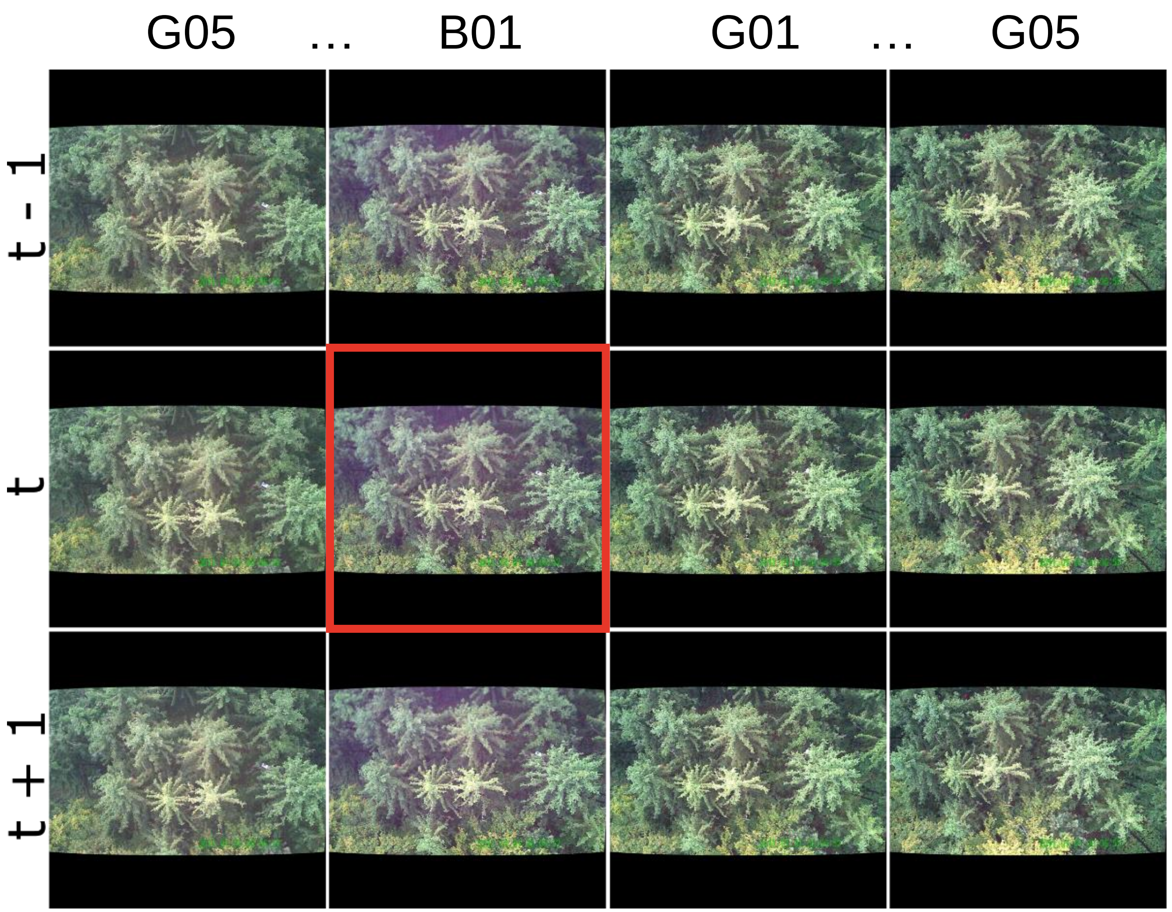
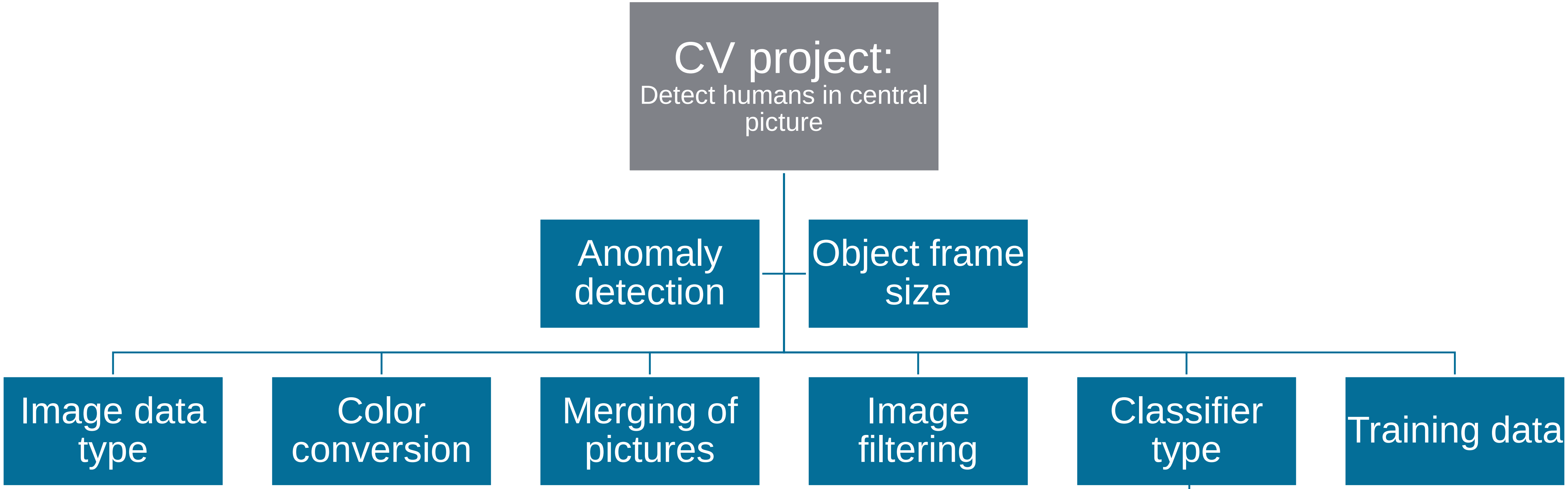
Training, Validation, and Test data

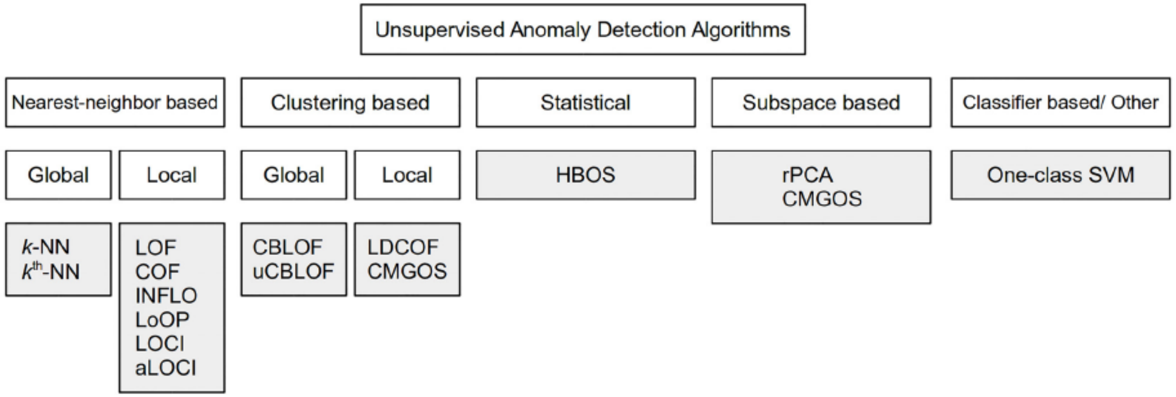
- 26 training sets with 70 pictures each
- 11 validation sets with 70 pictures each
- 13 test sets with 70 pictures each

- Goal: Bounding boxes in the 13 central pictures of the test set



Structuring the problem





[Goldstein and Uchida, „A Comparative Evaluation of Unsupervised Anomaly Detection Algorithms for Multivariate Data"]

Seitz et Dyer : View Morphing

- View morphing allows the computation of virtual cameras
- Maybe useful due to height difference of trees and humans on the ground

View Morphing

Steven M. Seitz   Charles R. Dyer

Department of Computer Sciences
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ABSTRACT

Image morphing techniques can generate compelling 2D transitions between images. However, differences in object pose or viewpoint often cause unnatural distortions in image morphs that are difficult to correct manually. Using basic principles of projective geometry, this paper introduces a simple extension to image morphing that correctly handles 3D projective camera and scene transformations. The technique, called *view morphing*, works by prewarping two images prior to computing a morph and then postwarping the interpolated images. Because no knowledge of 3D shape is required, the technique may be applied to photographs and drawings, as well as rendered scenes. The ability to synthesize changes both in viewpoint and image structure affords a wide variety of interesting 3D effects via simple image transformations.

CR Categories and Subject Descriptors: I.3.3 [Computer Graphics]: Picture/Image Generation– viewing algorithms; I.3.7 [Computer Graphics]: Three-Dimensional Graphics and Realism– animation; I.4.3 [Image Processing]: Enhancement– geometric correction, registration.

Additional Keywords: Morphing, image metamorphosis, view interpolation, view synthesis, image warping.

1 INTRODUCTION

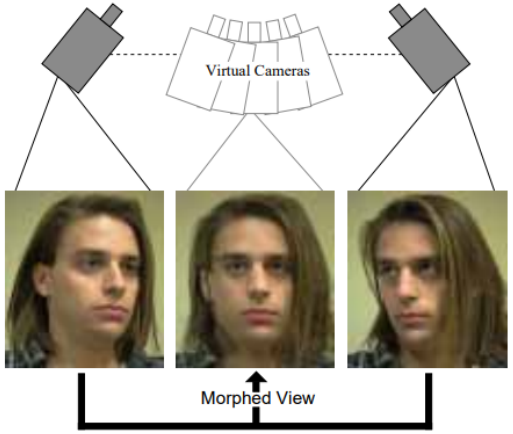


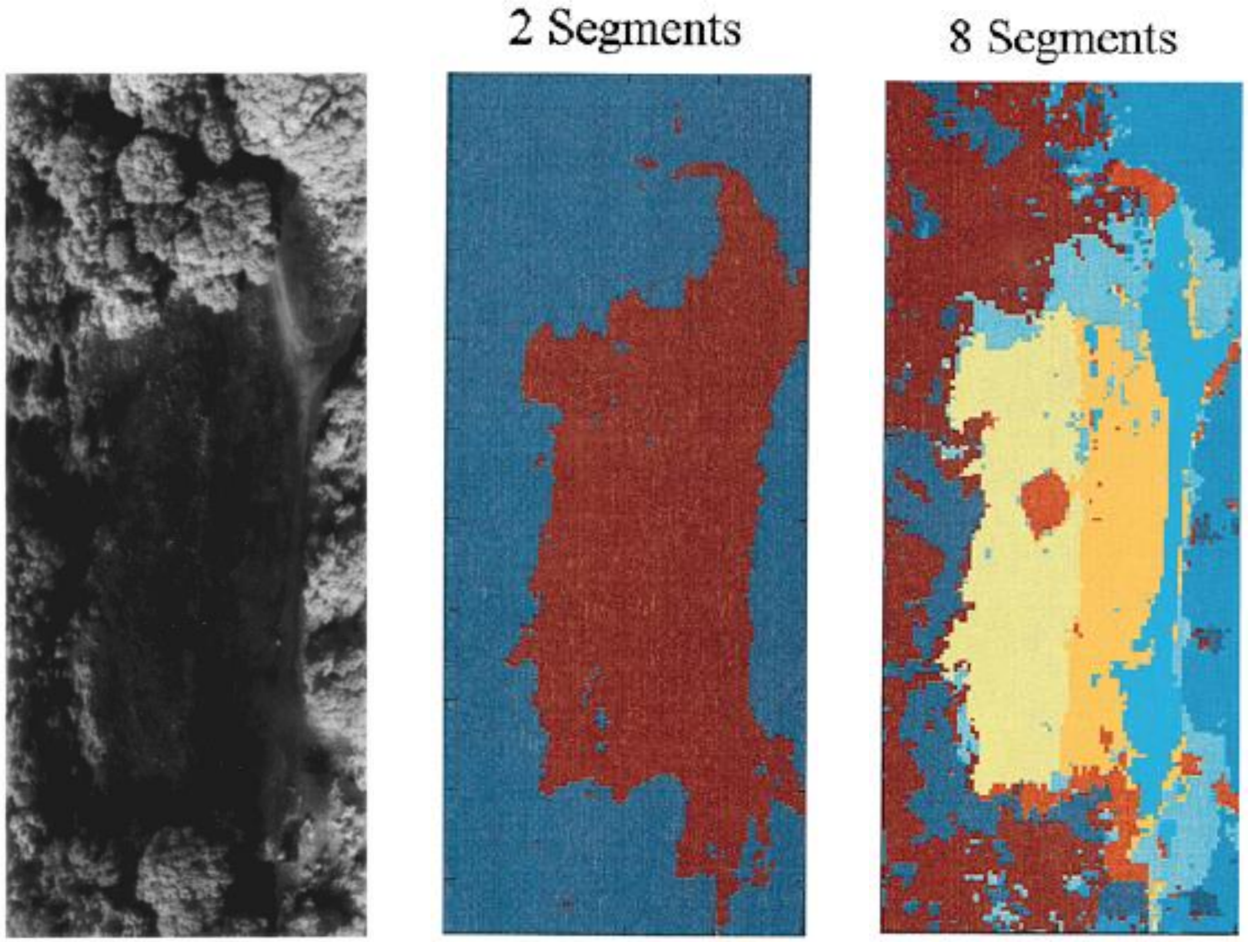
Figure 1: View morphing between two images of an object taken from two different viewpoints produces the illusion of physically moving a virtual camera.

tion and to design the interpolation to achieve the best results. Part of the problem is that existing image morphing methods do not ac-

Seitz and Dyer, „View Morphing“

Hazel : Multivariate Gaussian MRF for Multispectral Scene Segmentation and Anomaly Detection

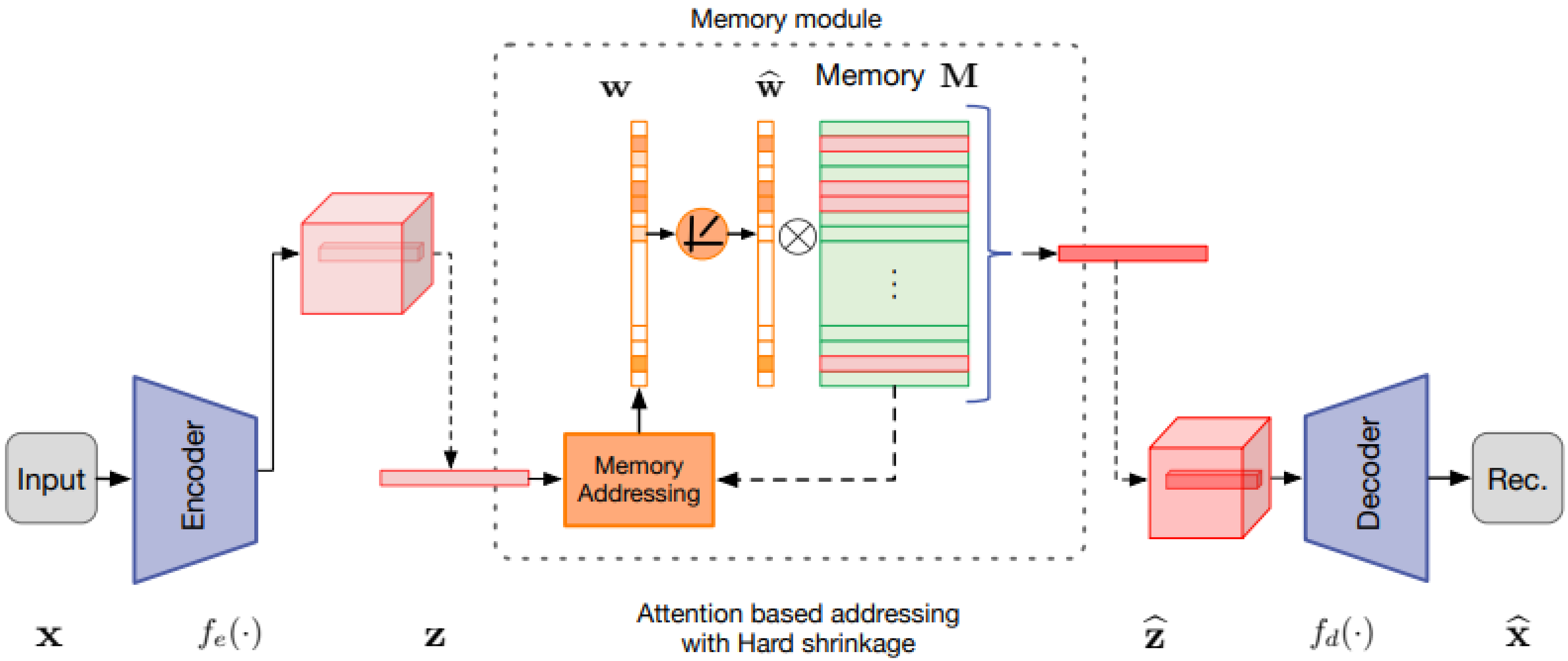
- Detect regions anomalous to the rest
- Detection by Multivariate Gaussian Random Fields
- Idea: each pixel belonging to an anomalous region of the image is also a contextual anomaly within its segment



Hazel: "Multivariate Gaussian MRF for Multispectral Scene Segmentation and Anomaly Detection"

Gong et al.: Memorizing Normality to Detect Anomaly: Memory-augmented Deep Autoencoder for Unsupervised Anomaly Detection

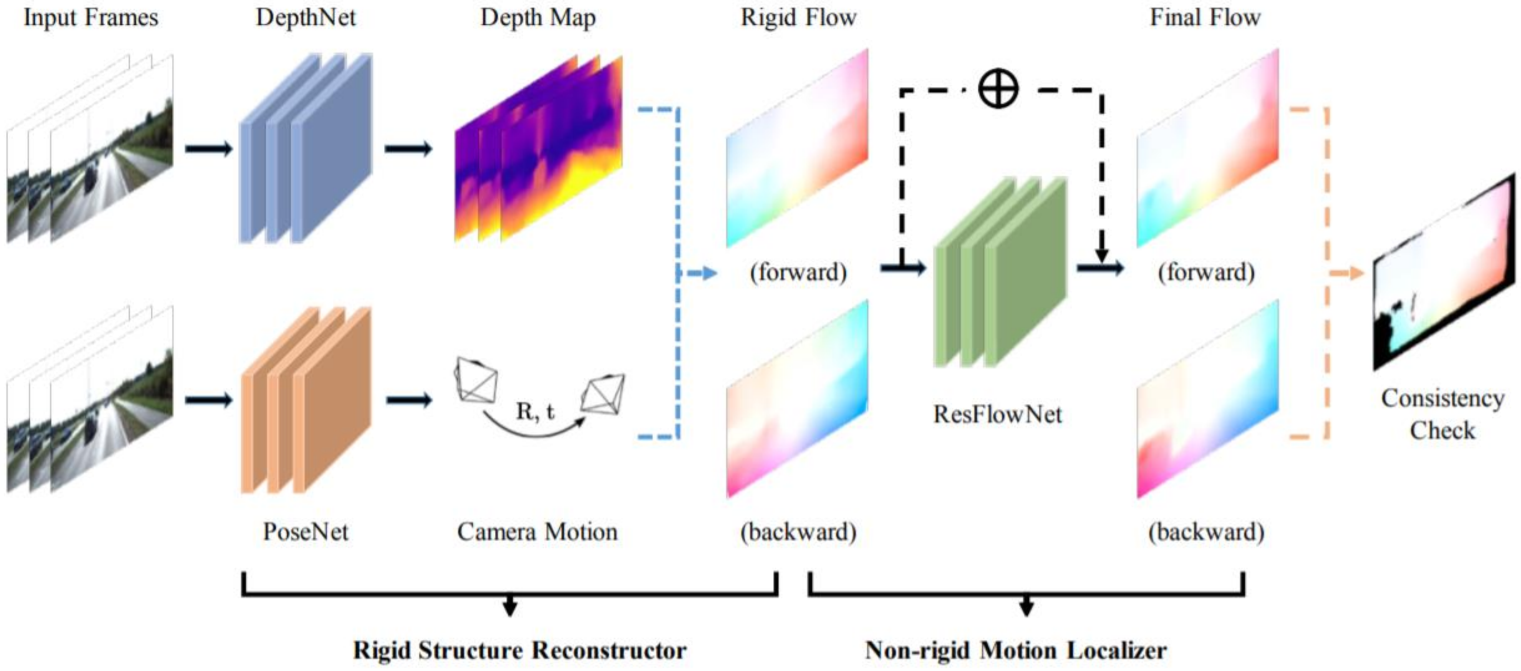
- Memory-augmented Autoencoder (MemAE)
- Bigger reconstruction errors on anomalies than on rest
- = amplifying the anomaly for detection



Gong et al.,“ Memorizing Normality to Detect Anomaly: Memory-augmented Deep Autoencoder for Unsupervised Anomaly Detection”

Yin et Shi : Unsupervised Learning of Dense Depth, Optical Flow and Camera Pose

- GeoNet = rigid structure reconstructor + non-rigid motion localizer
- Rigid structure reconstructor based on DepthNet
- Motion localizer based on ResFlowNet



Yin et Shi: "GeoNet: Unsupervised Learning of Dense Depth, Optical Flow and Camera Pose"

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