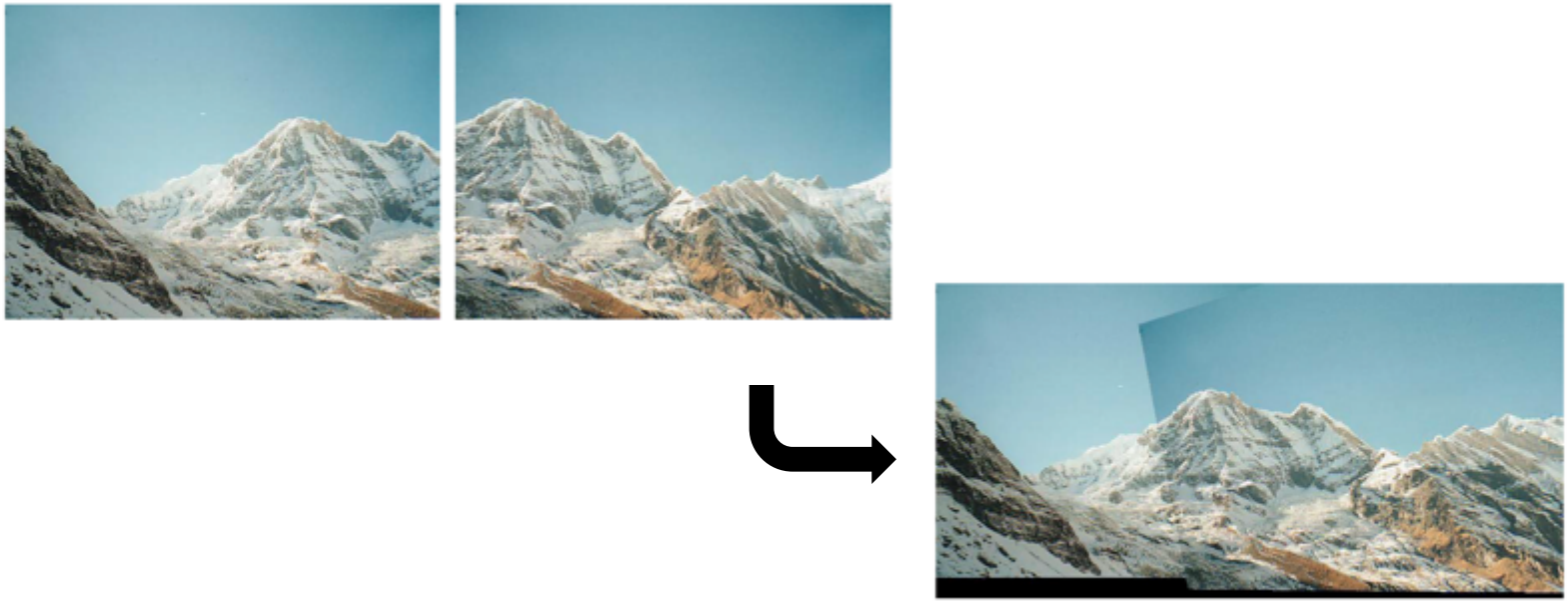
COMP 9517 Computer Vision

Feature-based Alignment and Image Stitching

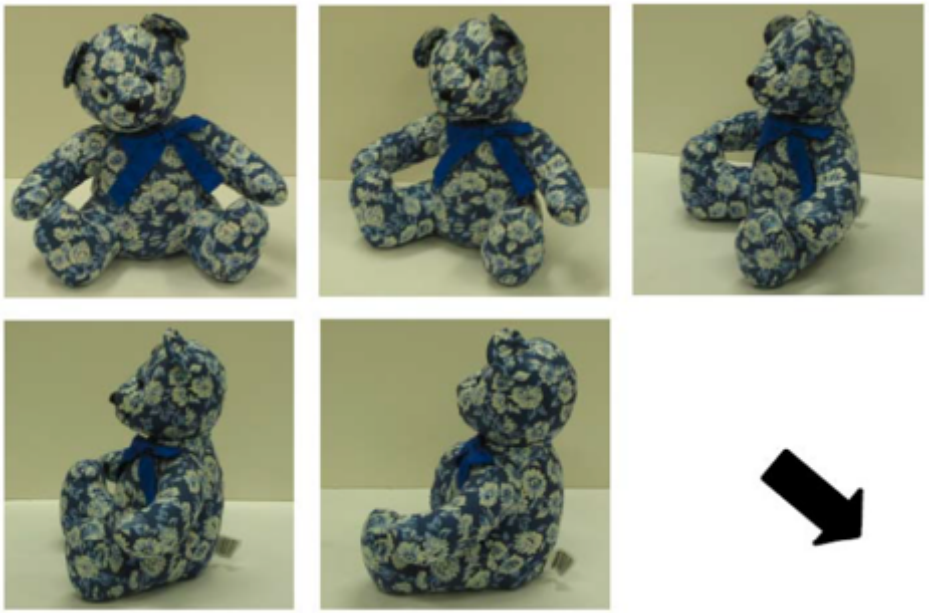
Introduction

- Feature-based alignment and image stitching are based on feature detection and matching, which are an essential component of many computer vision applications
  - Align images to form a panorama



Introduction -cnt

- Feature detection and matching are an essential component of many computer vision applications
  - Establish dense correspondences to construct a 3D model



Introduction - cnt

- Feature detection and matching are an essential component of many computer vision applications
  - Recognise objects in a cluttered scene

Image Alignment and Stitching

- How to do this?
  - Detect feature points in images

Image Alignment and Stitching - cnt

- How to do this?
  - Find correspondences

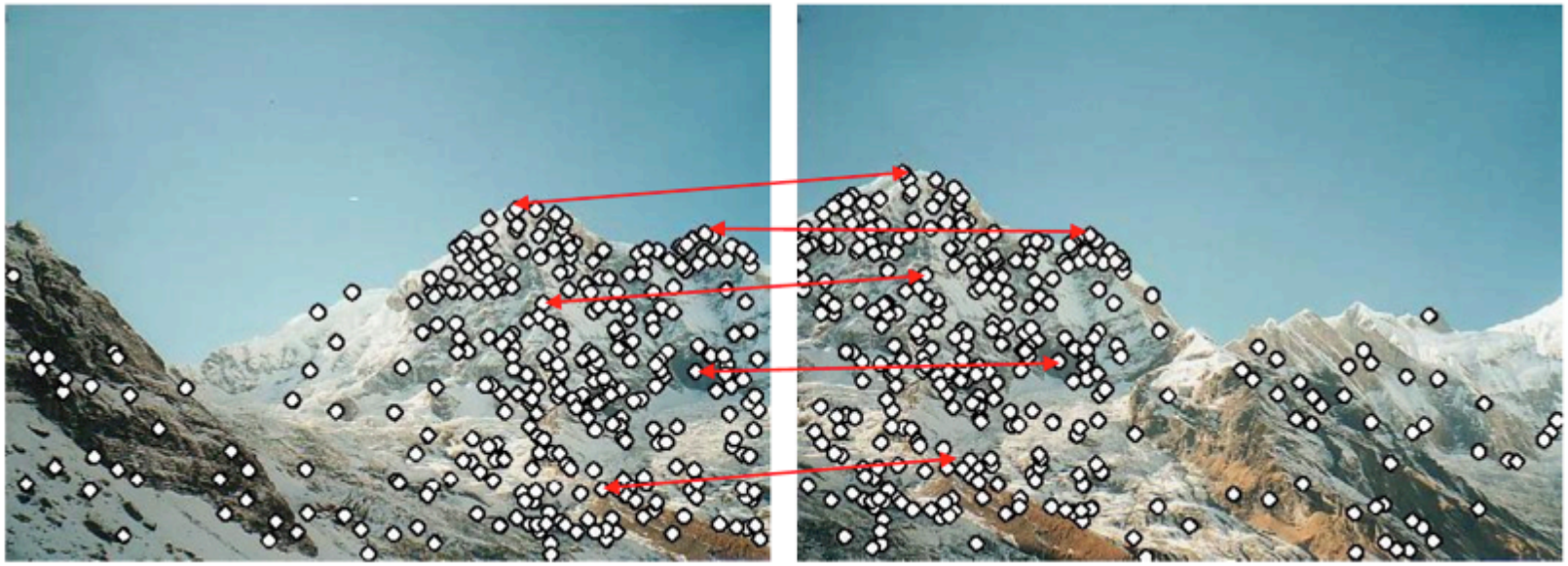
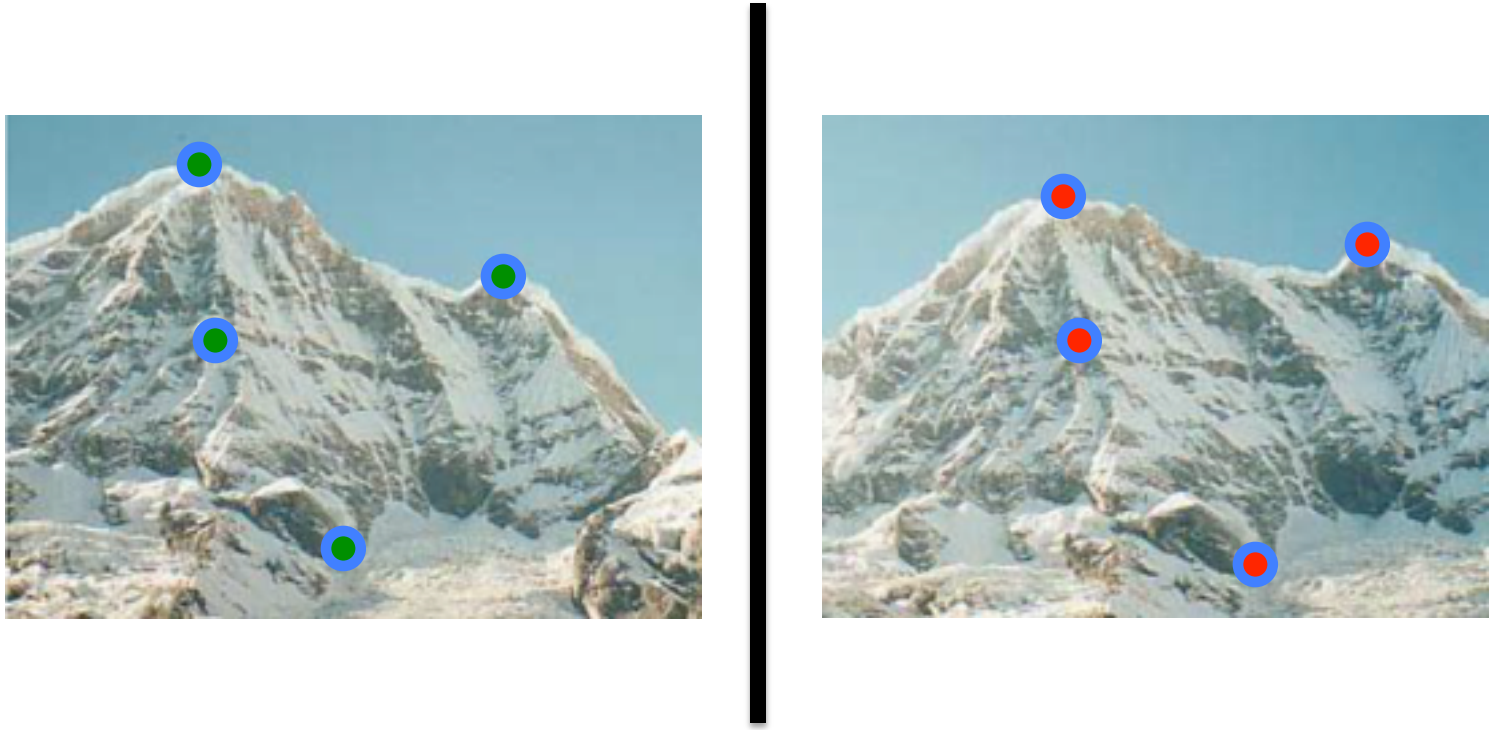


Image Alignment and Stitching - cnt

- How to do this?
  - Find a parametric transformation

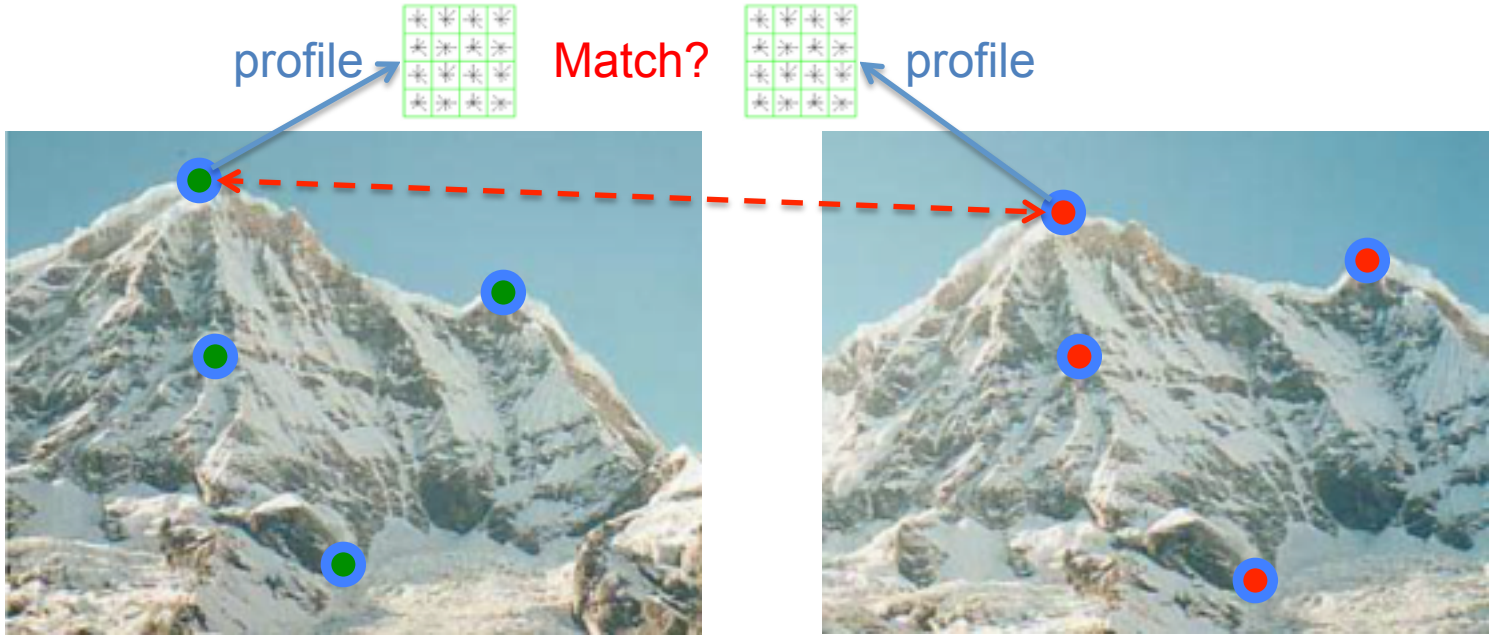
Feature Detector

- We need a repeatable detector that detect the same point independently in different images



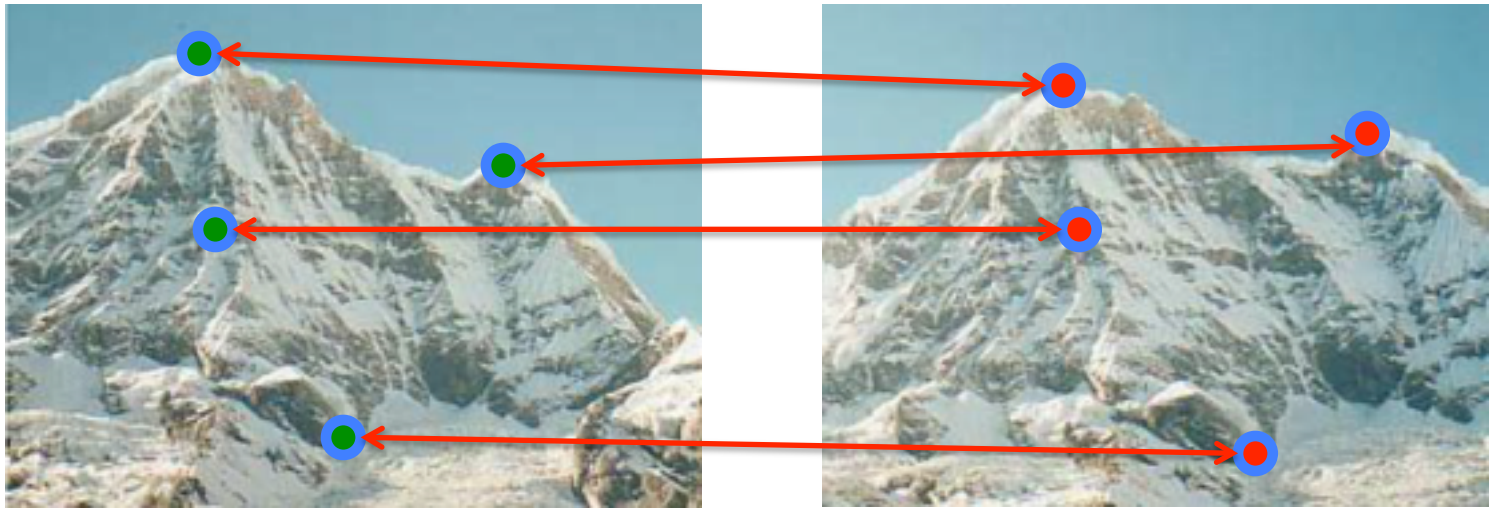
Feature Descriptor

- We need a reliable and distinctive descriptor in order to be able to match the feature points



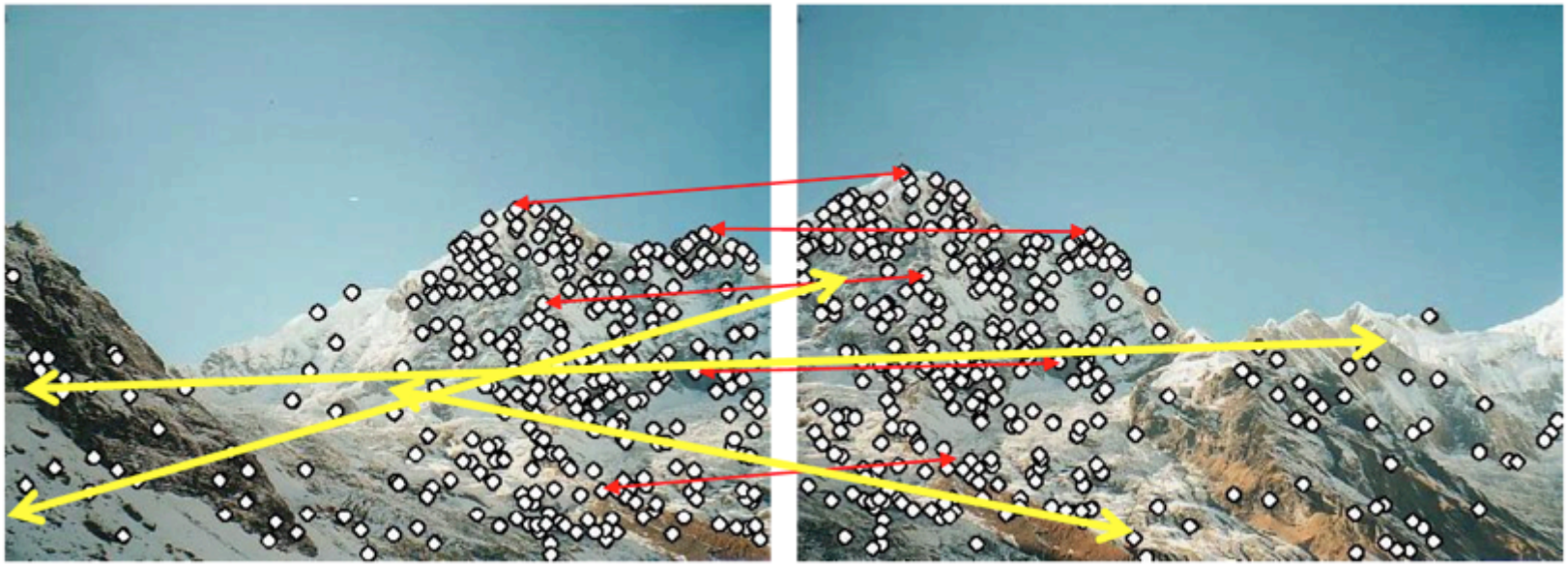
Correspondences

- We need a reliable and efficient way to find correspondences
  - Many matches, which one to choose?



Transformation

- We need the estimation of a transformation between images in a way that is robust to erroneous correspondences



References and Acknowledgements

- Szeliski, Chapter 4
- Some content are extracted from the above resource and James Hays slides