

A close-up photograph of two young girls with dark hair, smiling warmly at the camera. They are wearing traditional green Korean clothing with patterned collars. The background is dark and out of focus.

LOCAL IMAGE MATCHING

HYUN SOO PARK

RECALL: SIFT FEATURE MATCHING

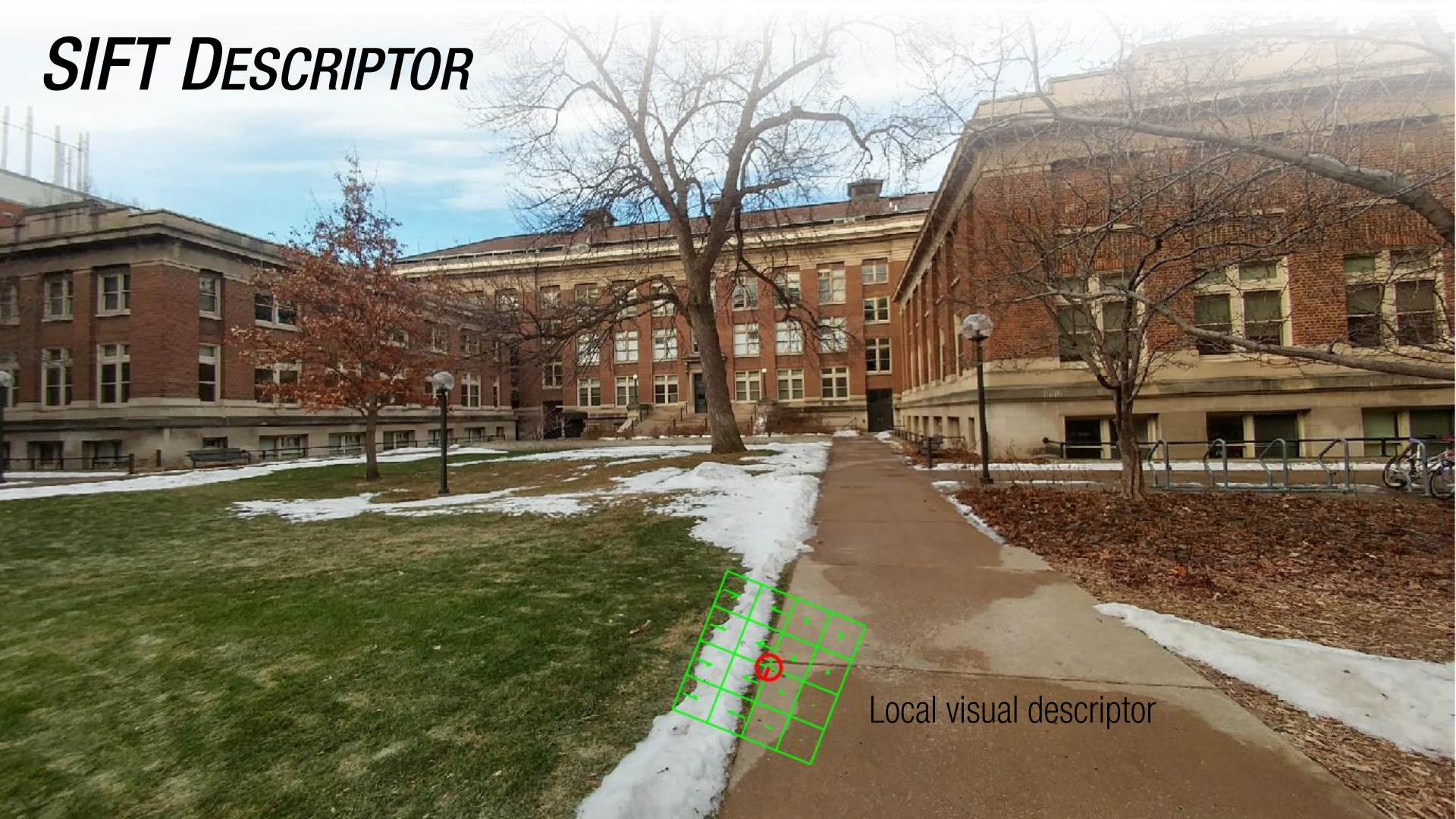


SIFT DESCRIPTOR



Local visual descriptor

SIFT DESCRIPTOR



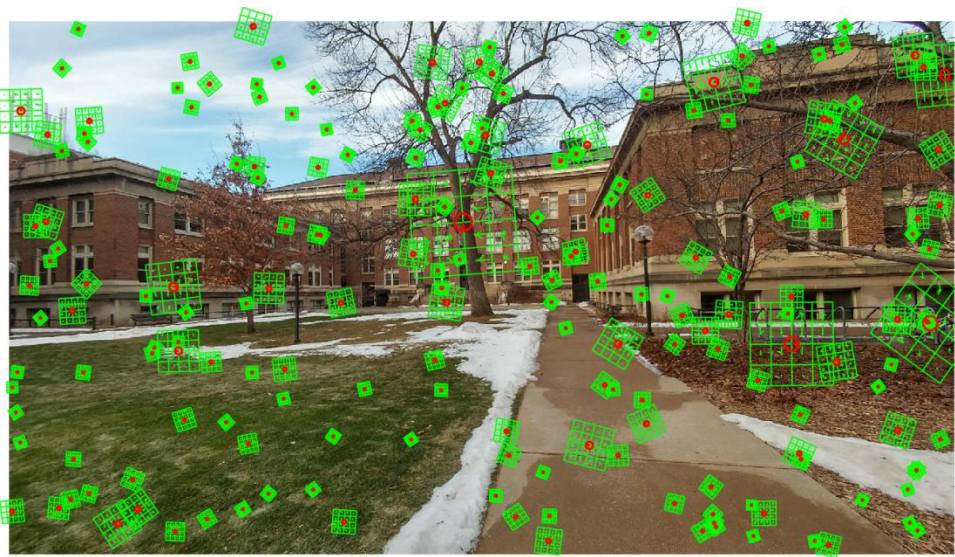
Local visual descriptor

FEATURE SIMILARITY ~ SSD (SUM OF SQUARED DISTANCE)

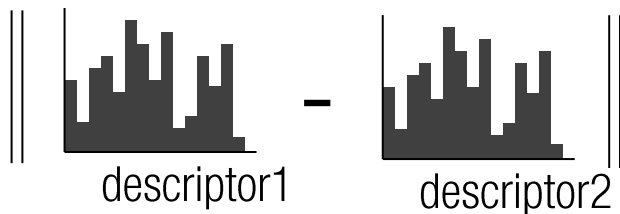


$$\left\| \begin{array}{c} \text{descriptor1} \\ \text{descriptor2} \end{array} \right\| = 0$$

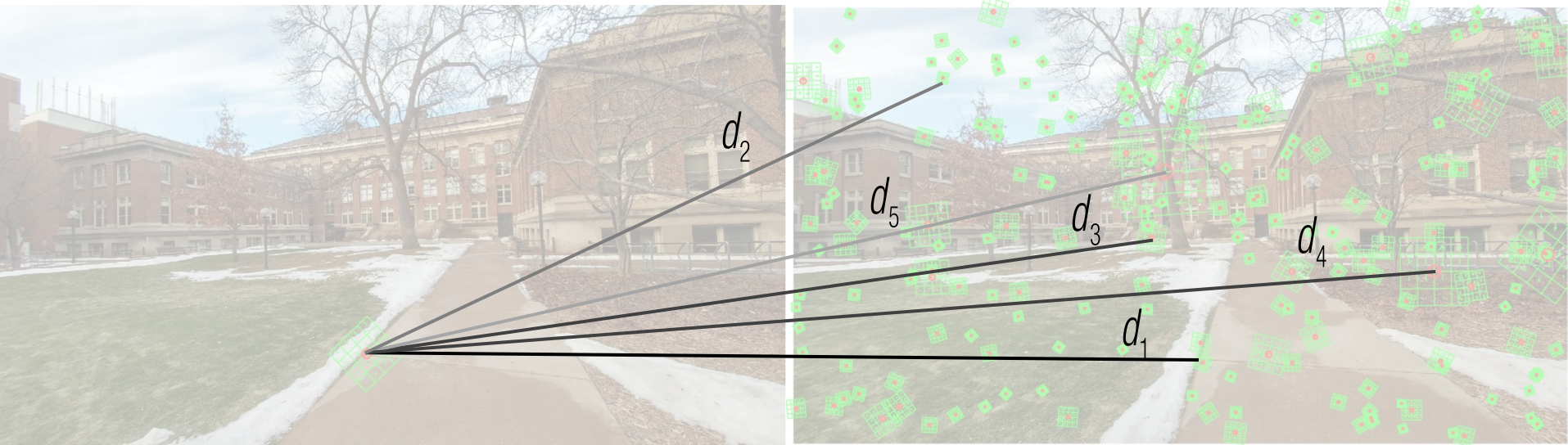
NEAREST NEIGHBOR SEARCH



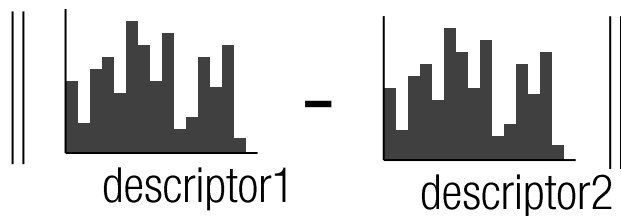
Feature match candidates



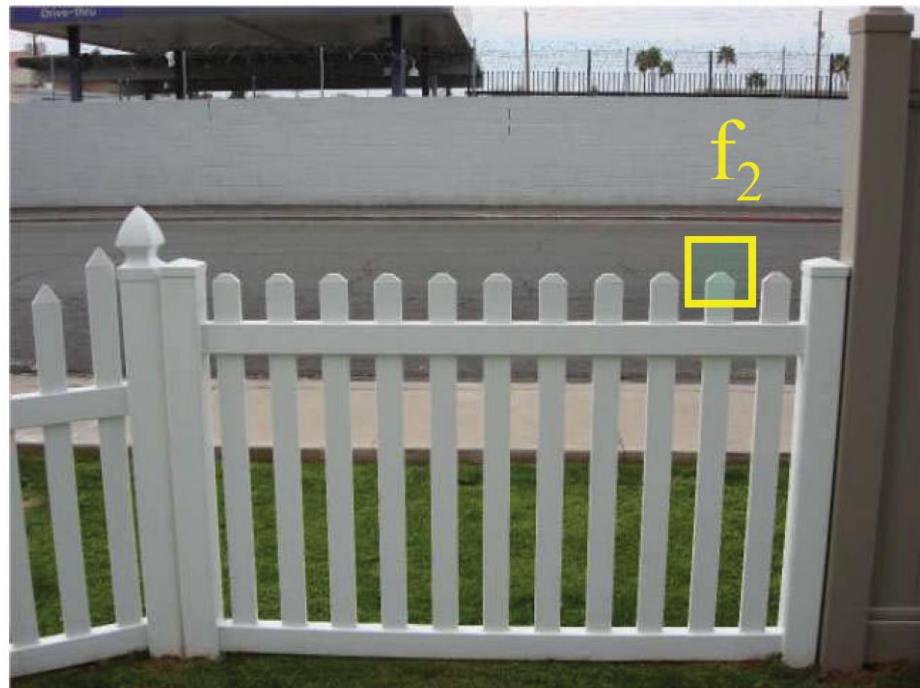
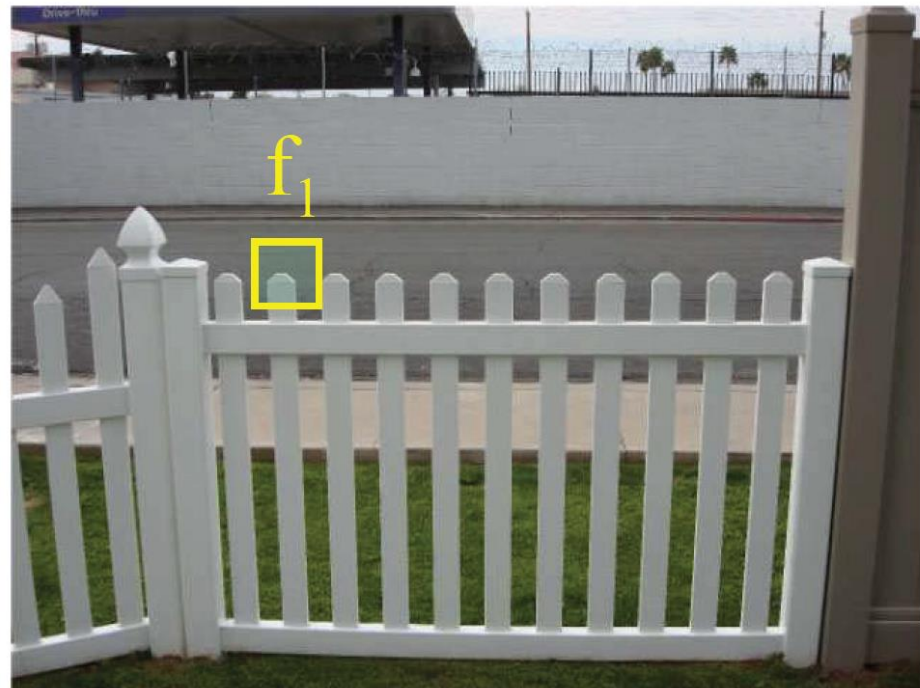
NEAREST NEIGHBOR SEARCH



Feature match candidates



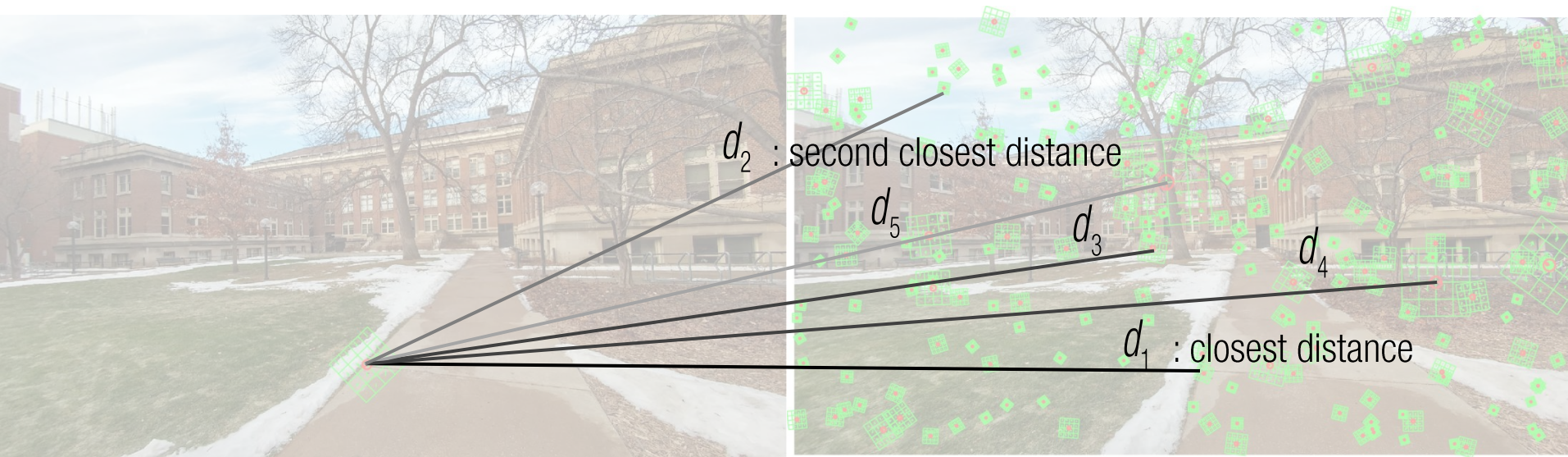
FEATURE DISCRIMINATIVITY





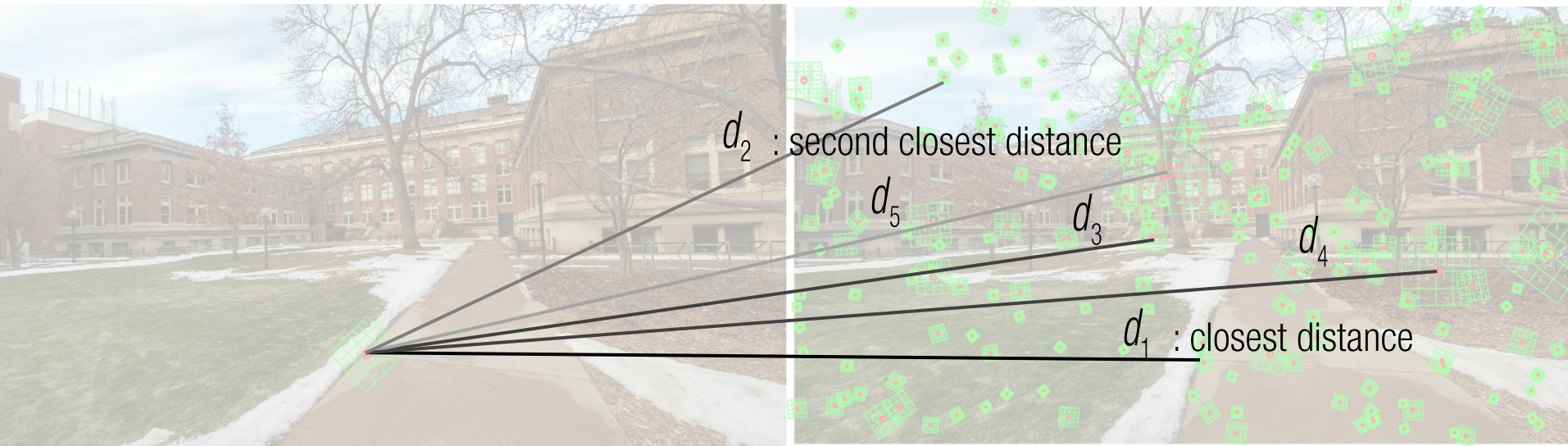


FEATURE DISCRIMINATIVITY



Discriminativity: how is the feature point unique? Feature match candidates

FEATURE DISCRIMINATIVITY

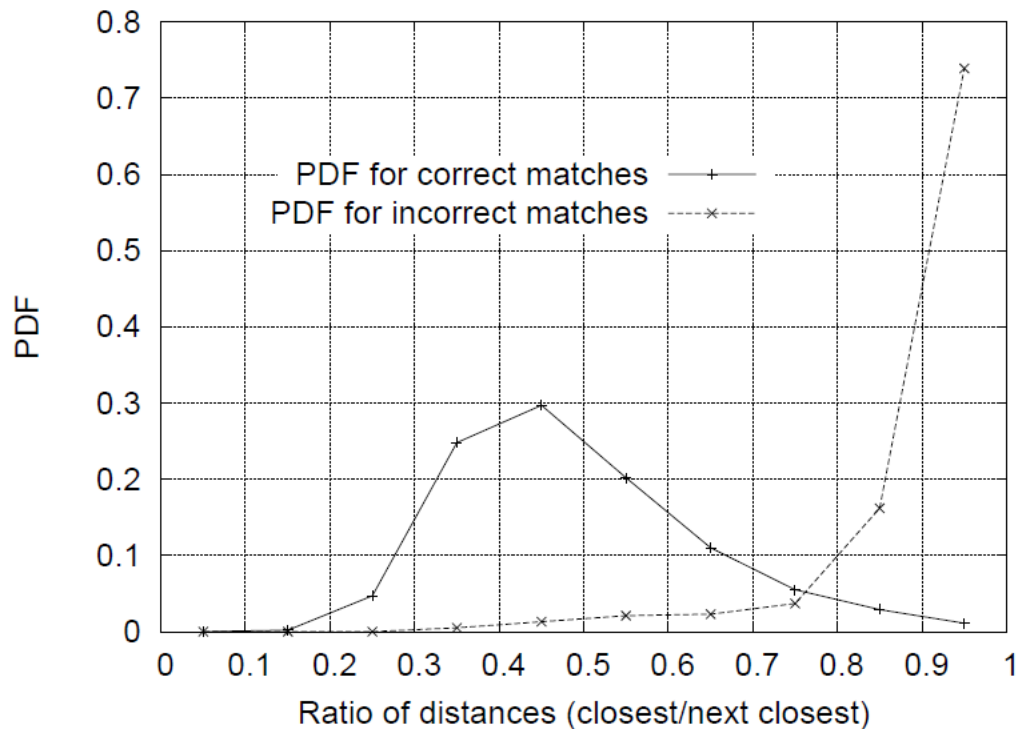


Discriminativity: how is the feature point unique?

Feature match candidates

$$\frac{d_1}{d_2} < 0.7$$

FEATURE DISCRIMINATIVITY



NEAREST NEIGHBOR SEARCH W/O RATIO TEST



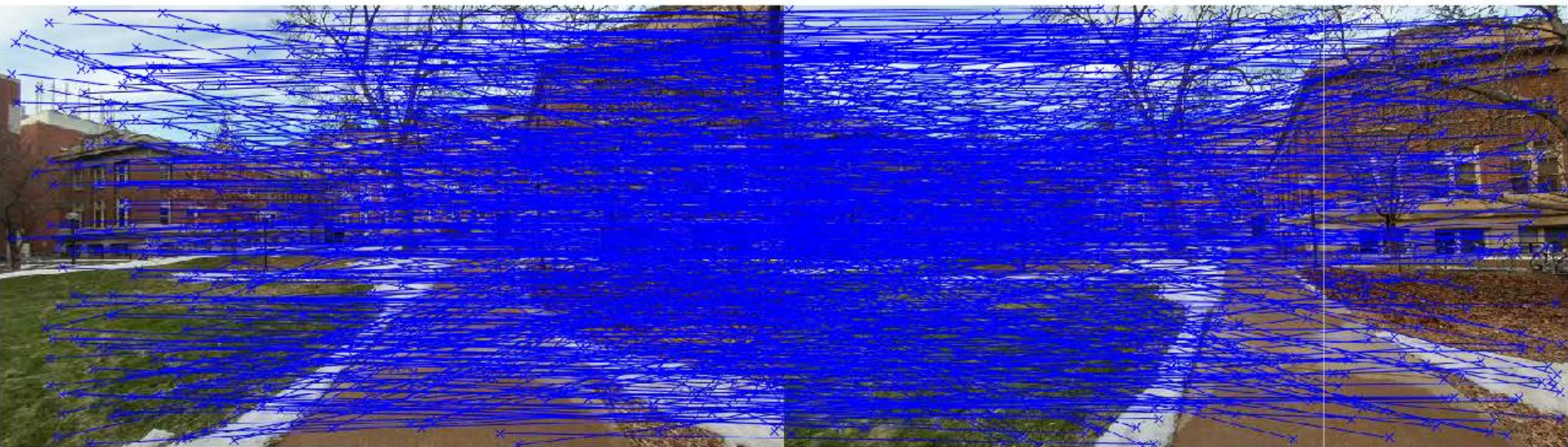
Left image → right image

NEAREST NEIGHBOR SEARCH W/ RATIO TEST



Left image → right image

NEAREST NEIGHBOR SEARCH W/O RATIO TEST



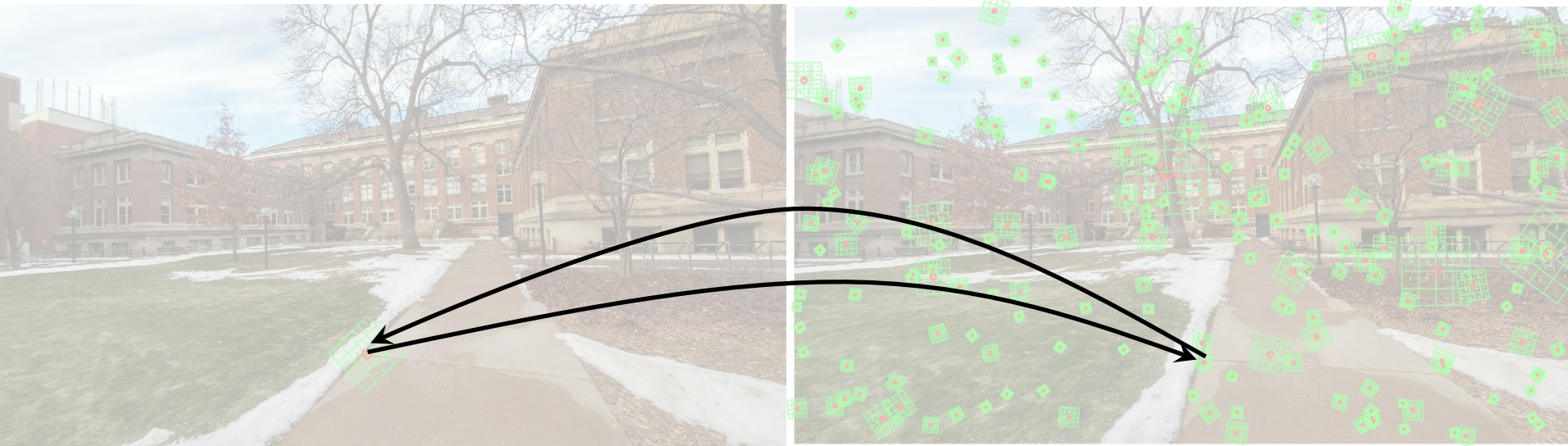
Left image ← right image

NEAREST NEIGHBOR SEARCH W/ RATIO TEST



Left image ← right image

BI-DIRECTIONAL CONSISTENCY CHECK

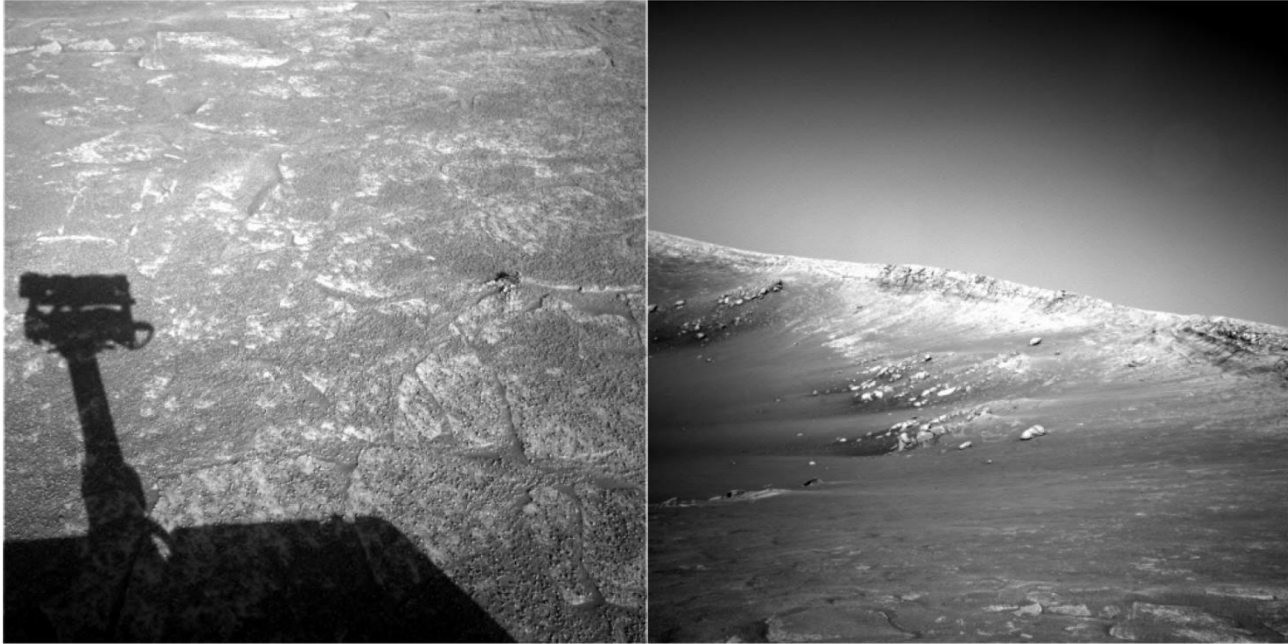


Consistency: would a feature match correspond to each other? Feature match candidates

BI-DIRECTIONAL CONSISTENCY CHECK

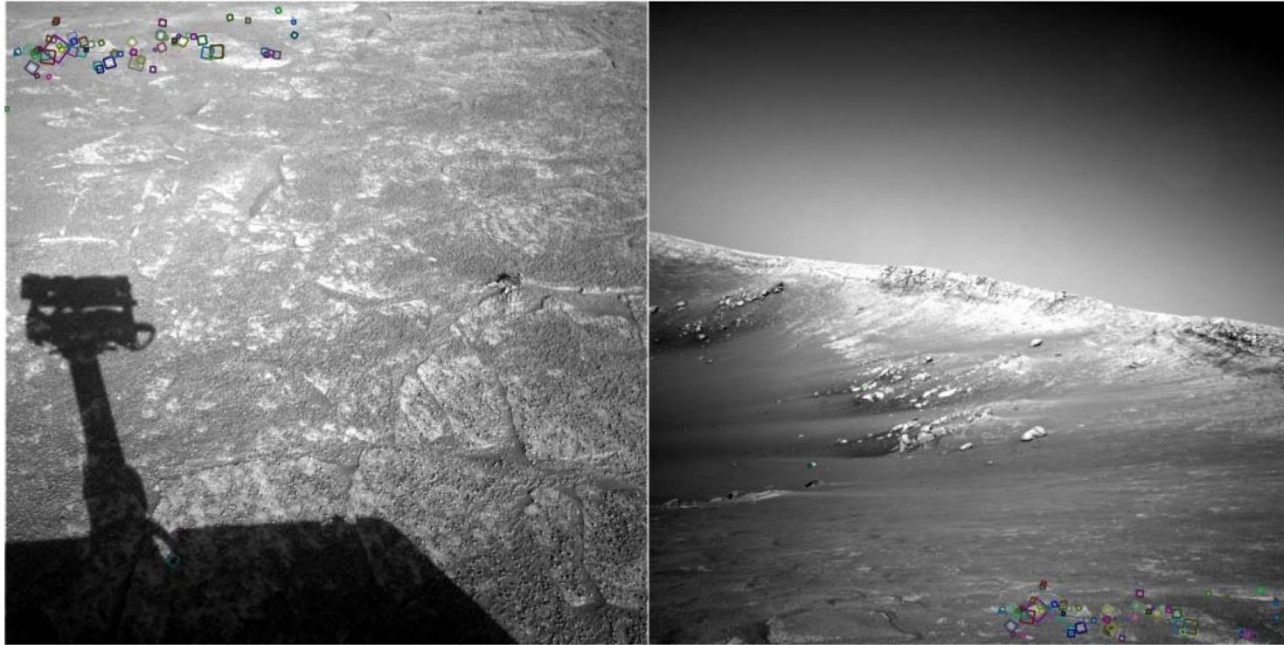


SIFT FEATURE MATCHING



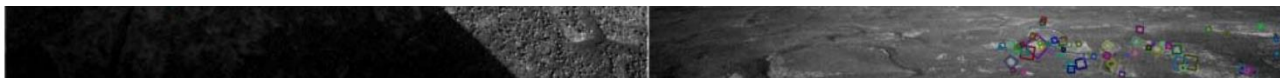
NASA Mars Rover images

SIFT FEATURE MATCHING



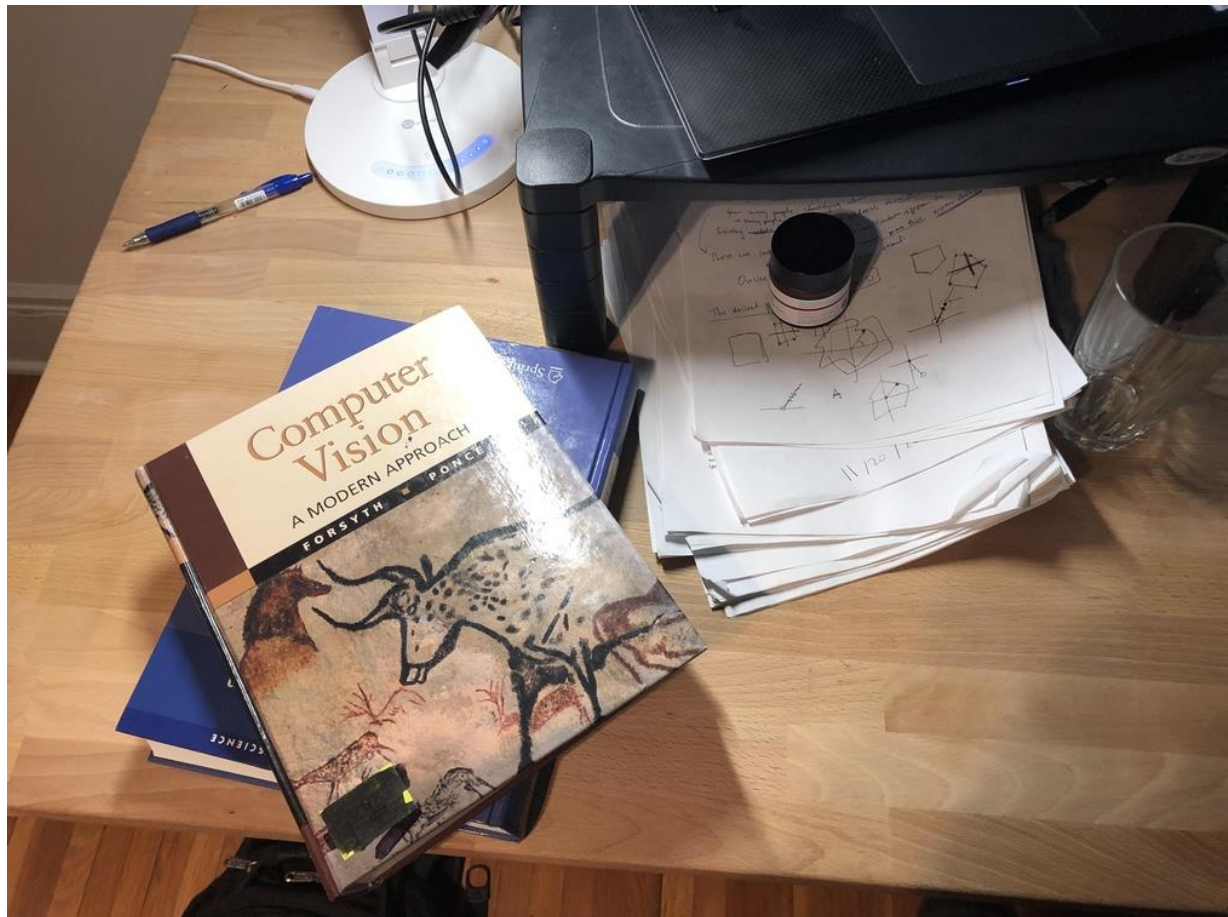
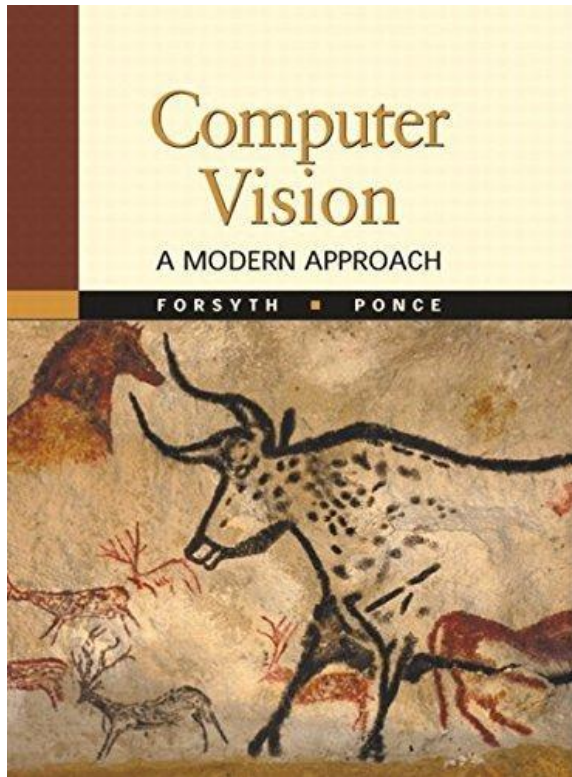
NASA Mars Rover images
with SIFT feature matches
Figure by Noah Snavely

SIFT FEATURE MATCHING

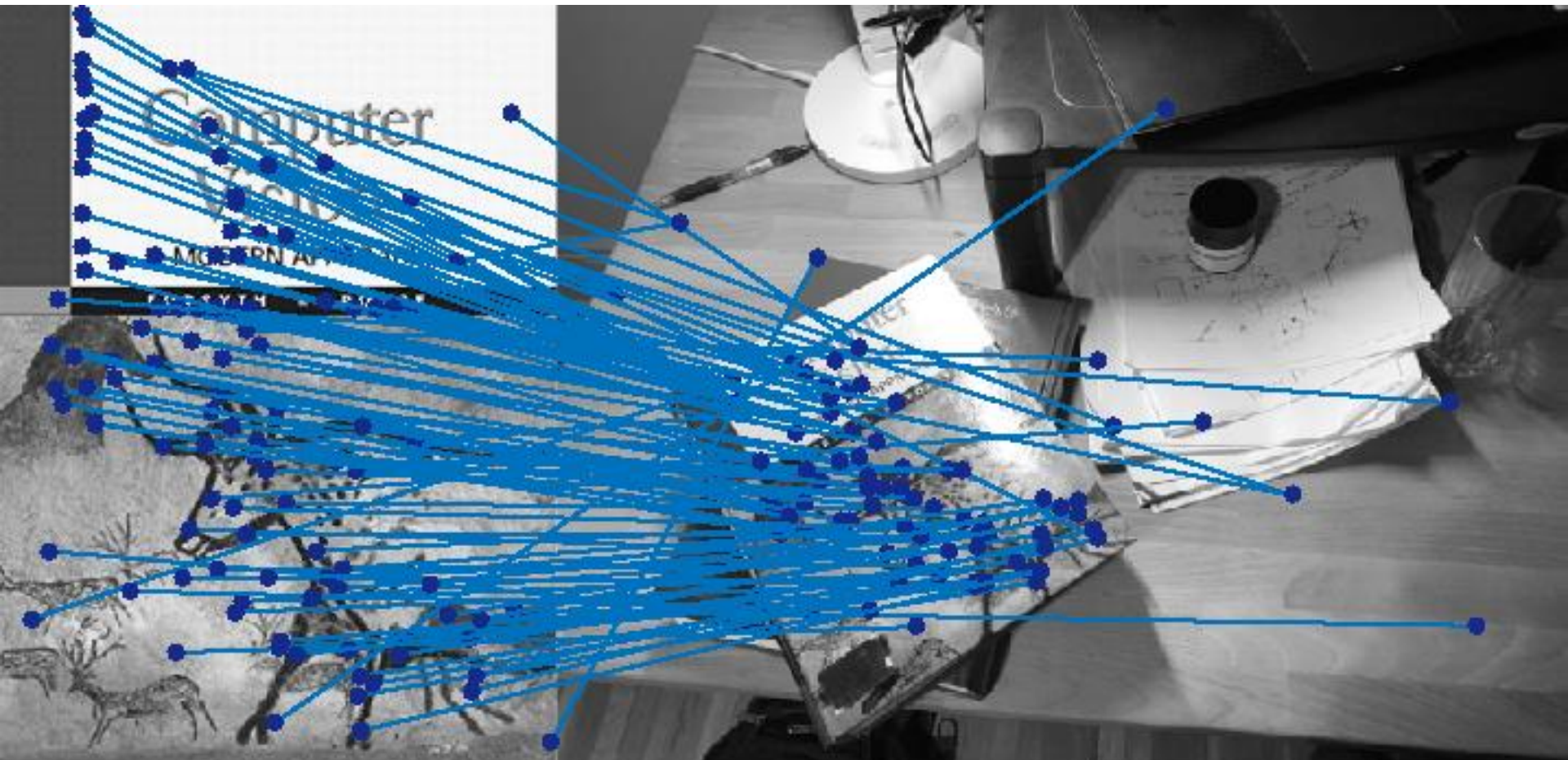


NASA Mars Rover images
with SIFT feature matches
Figure by Noah Snavely

OBJECT RECOGNITION



LOCAL FEATURE MATCHING



ROBUST FILTERING

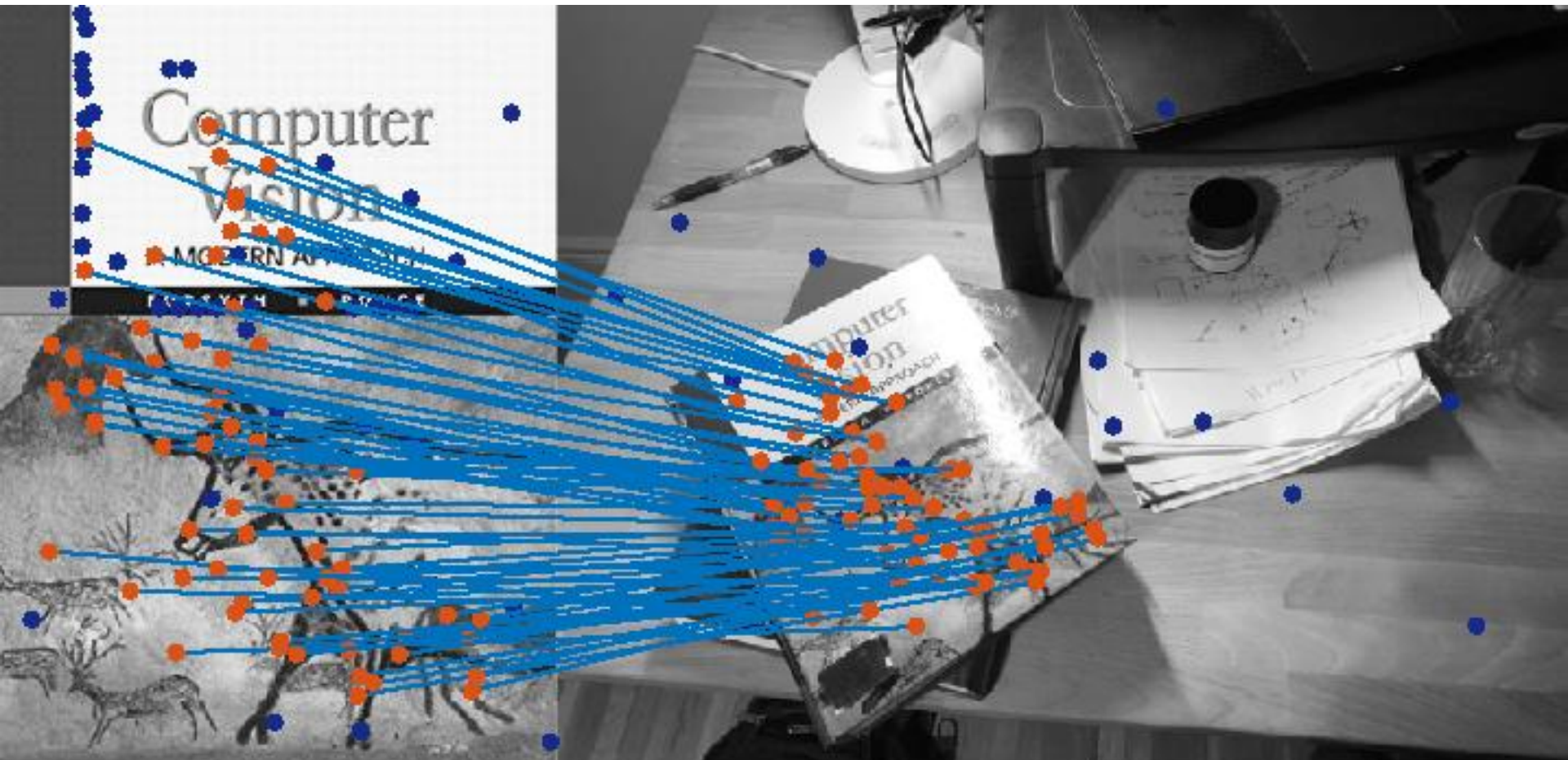


IMAGE WARPING

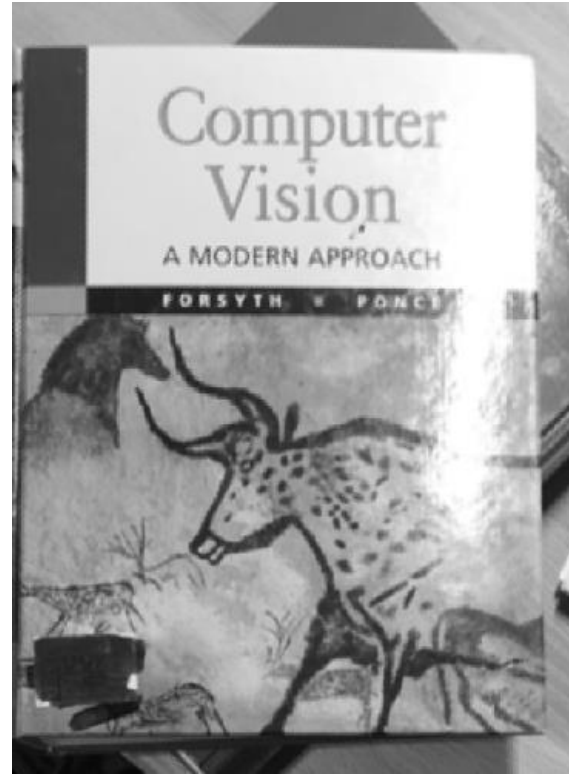
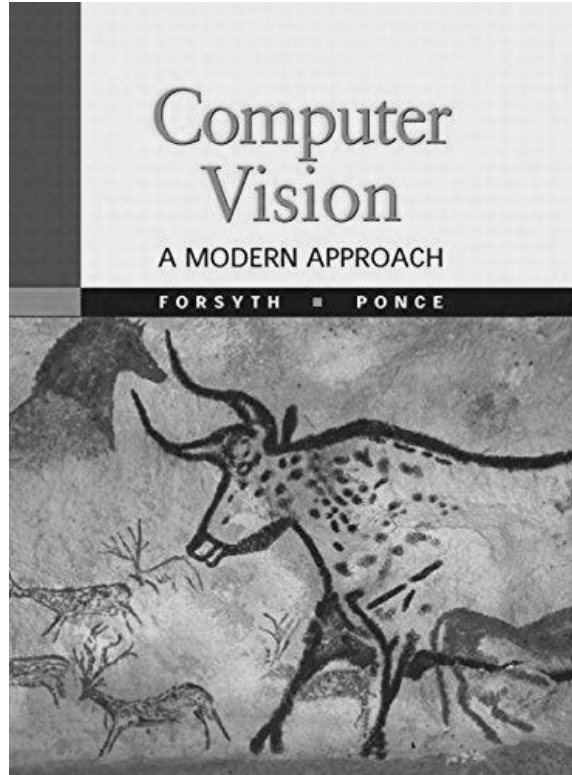


IMAGE WARPING

Computer Vision

A MODERN APPROACH

FORSYTH ■ PONCE



IMAGE WARPING

