Machine Learning Institute
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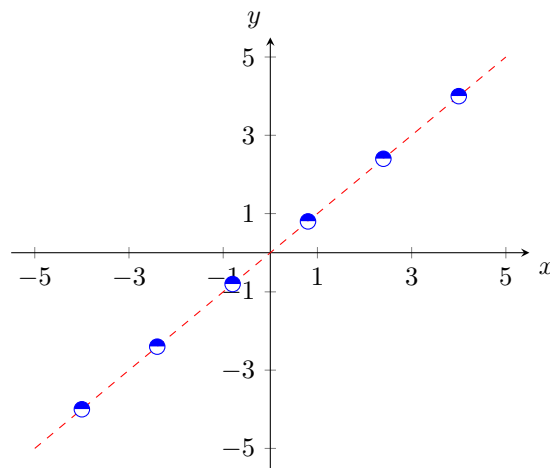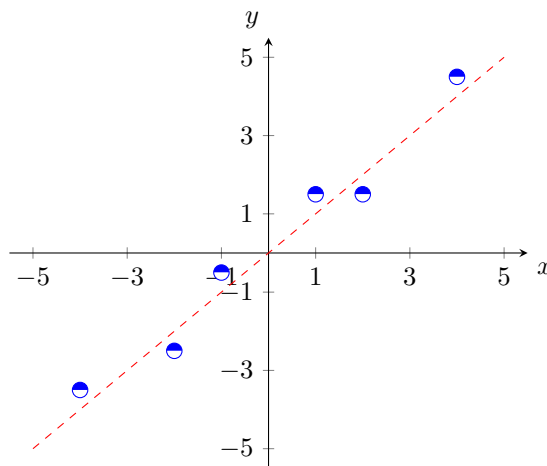Web http://cil.inf.ethz.ch/

Series 12 Solutions
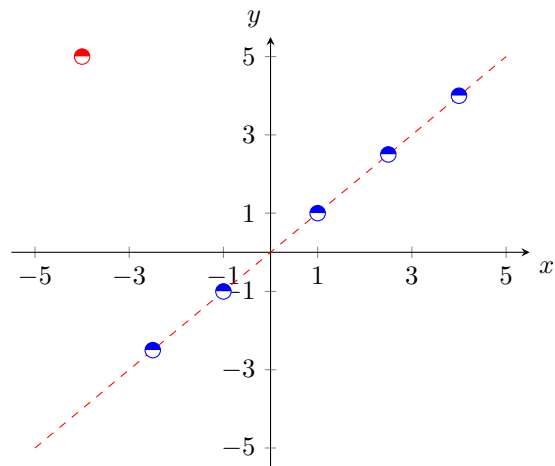# (Robust PCA)

Problem 2 (RPCA Theory):

We are given the following set of points shown in the figure below. The red line is the principal component of this set, denoted u_1.

- Suggest a corrupted version of these points such that PCA can still estimate the principal component u_1.
  Solution:

- Suggest a corrupted version of these points such that Robust PCA estimates the principal component more reliably than PCA.

  Solution:

Problem 3 (RPCA Application):

We use robust PCA to extract the foreground and background of a video. The left-most image shows one frame extracted from the video with its corresponding background and foreground in the middle and right image respectively.

We see that each person in the video is considered as foreground, except the one in the rectangle. Can you explain why this is the case?

Solution: This person is standing, hence RPCA method considers him as background.