

---

# Regularizers versus Losses for Nonlinear Dimensionality Reduction

---

Yaoliang Yu, James Neufeld, Ryan Kiros, Xinhua Zhang, Dale Schuurmans

Department of Computing Science, University of Alberta, Edmonton, AB T6G 2E8 Canada

## Supplementary Material

**Swiss Roll and Face data sets.** These two data sets were obtained from <http://isomap.stanford.edu/datasets.html>; citation:

J. B. Tenenbaum, V. de Silva and J. C. Langford, *A Global Geometric Framework for Nonlinear Dimensionality Reduction*. Science, Vol 290, Issue 5500, pp 2319–2323, 22 December 2000.

Some example images are shown in Figures 1 and 2.

**3d-Sin Wave data set.** This data set, illustrated in Figure 3, is based on the helix dataset in the drtoolbox toolbox:

L.J.P. van der Maaten, E.O. Postma, and H.J. van den Herik. *Dimensionality Reduction: A Comparative Review*. Tilburg University Technical Report, TiCC-TR 2009-005, 2009.

**Brush data set.** This data set is illustrated in Figure 4.

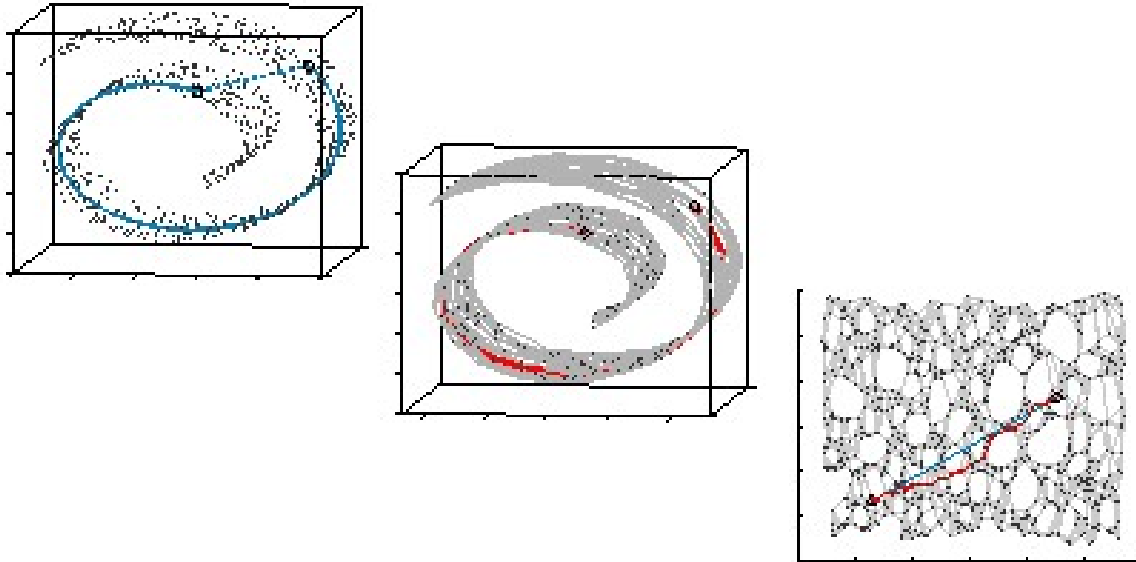


Figure 1. Swiss roll dataset from <http://isomap.stanford.edu/datasets.html>. The data set size was reduced by including only every 10th data point.

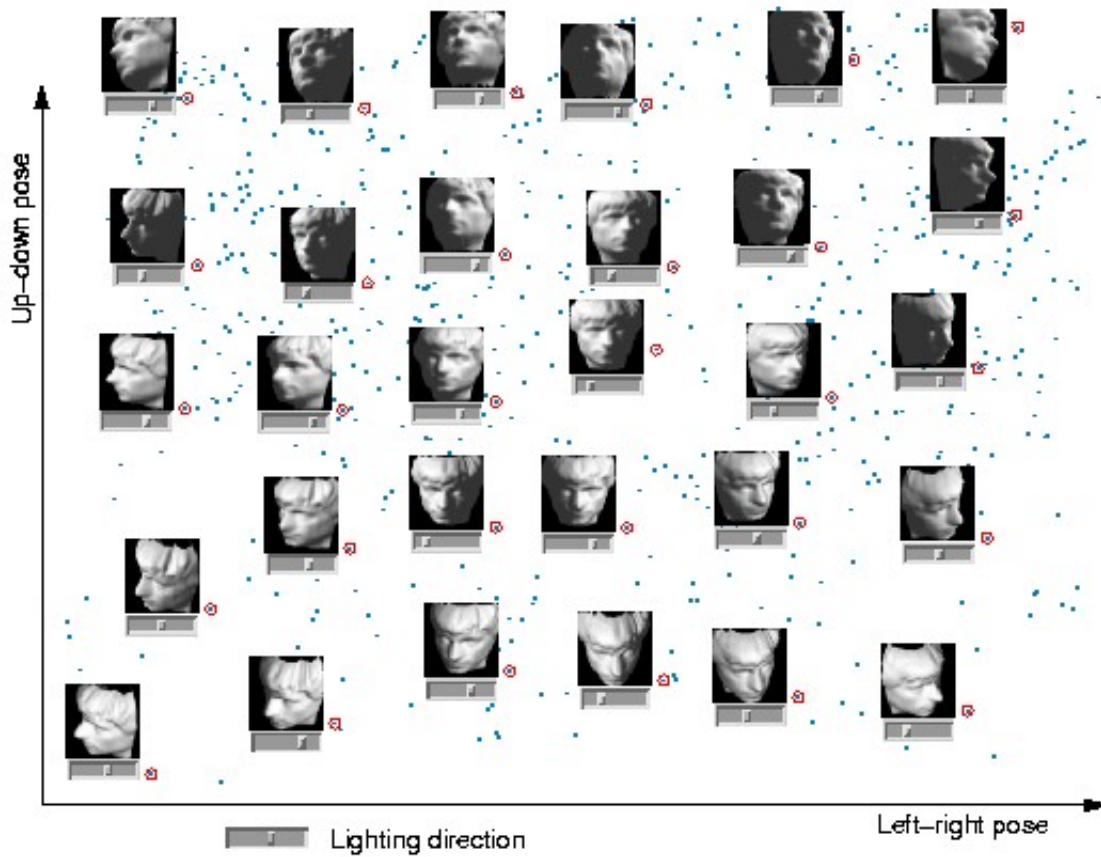


Figure 2. Faces dataset from <http://isomap.stanford.edu/datasets.html>.

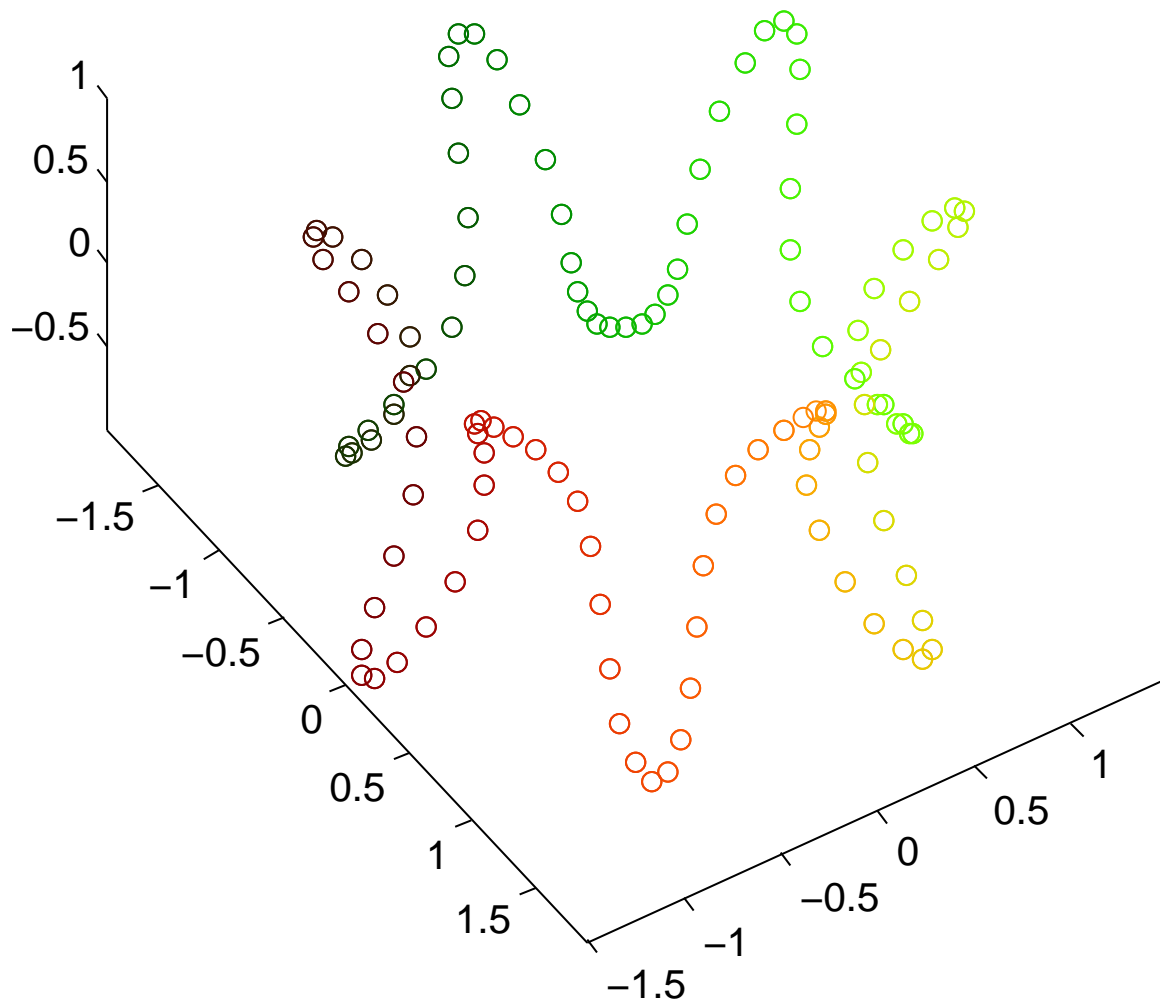


Figure 3. 3d sin wave dataset

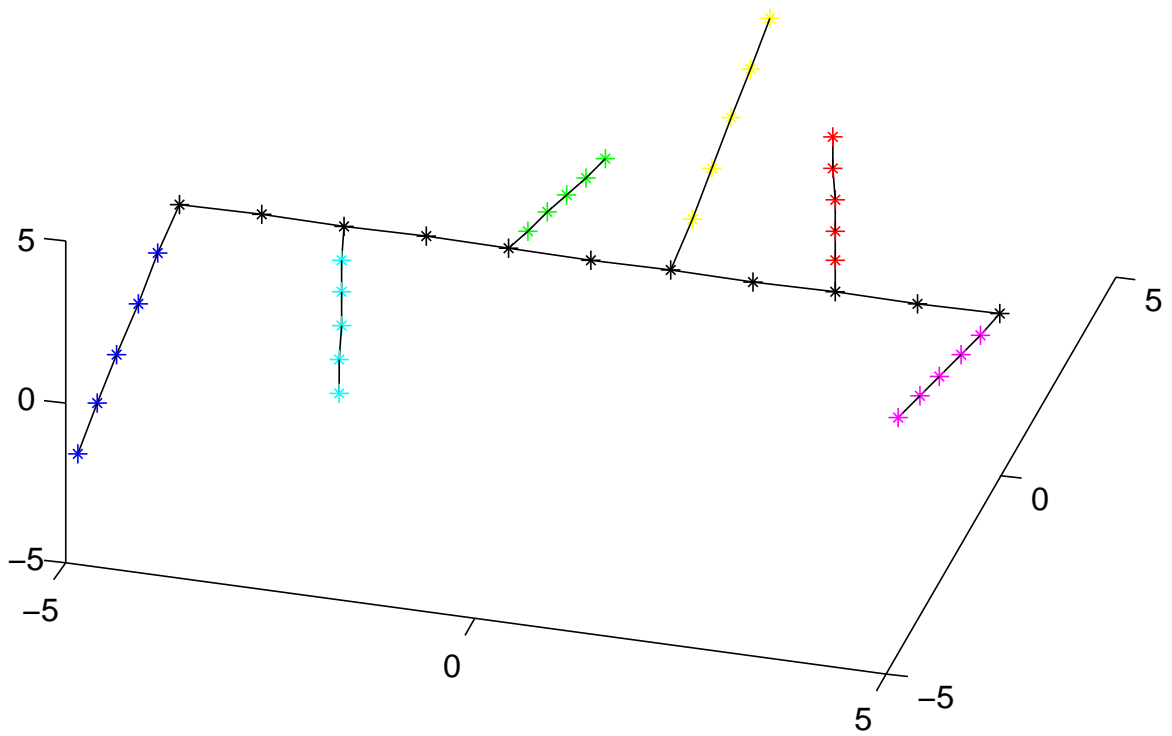


Figure 4. Brush dataset