

36-315: Statistical Graphics and Visualization

Homework 2

Date: January 22, 2002

Due: start of class January 27, 2002

1. From the course web page, download `hw2.csv`. Load this data into R and extract the column named `data` (not `POPPSQMI`).
 - (a) Make a histogram, density curve, jitterplot, and histodot plot of this data. Use scale 0.2 for the jitterplot, but default settings for the rest. Turn in all four plots.
 - (b) Describe the distribution of this data. What important feature is shown in the jitter and histodot but hidden in the histogram and density curve?
 - (c) Make another histogram using 20 bins. (You don't have to turn it in.) Why doesn't this plot help to identify the missing feature?
2. The "Nighttime Map" produced by the Census Bureau uses dots to depict population density (<http://www.census.gov/geo/www/mapGallery/USPD-1990.html>). Suppose the Bureau instead made a histogram map, where each census tract was shaded according to its population density. What information about the U.S. population density would be gained in making this change? What information would be lost?
3. The figure on the next page is a jitterplot used in a paper on the statistics of Ethernet traffic.¹ A dot represents one packet of data passing through a certain location in the network at a time indicated by the horizontal axis. The plot is intended to show three things: (1) the intensity of traffic over time, (2) the abrupt changes in traffic, (3) isolated bursts of traffic. For each of the four displays (histogram, density curve, jitterplot, and histodot plot), describe how well it would perform at these tasks. Is there a better display than what the paper chose?

¹"Self-Similarity Through High-Variability: Statistical Analysis of Ethernet LAN Traffic at the Source Level," by Walter Willinger, Murad S. Taqqu, Robert Sherman, and Daniel V. Wilson

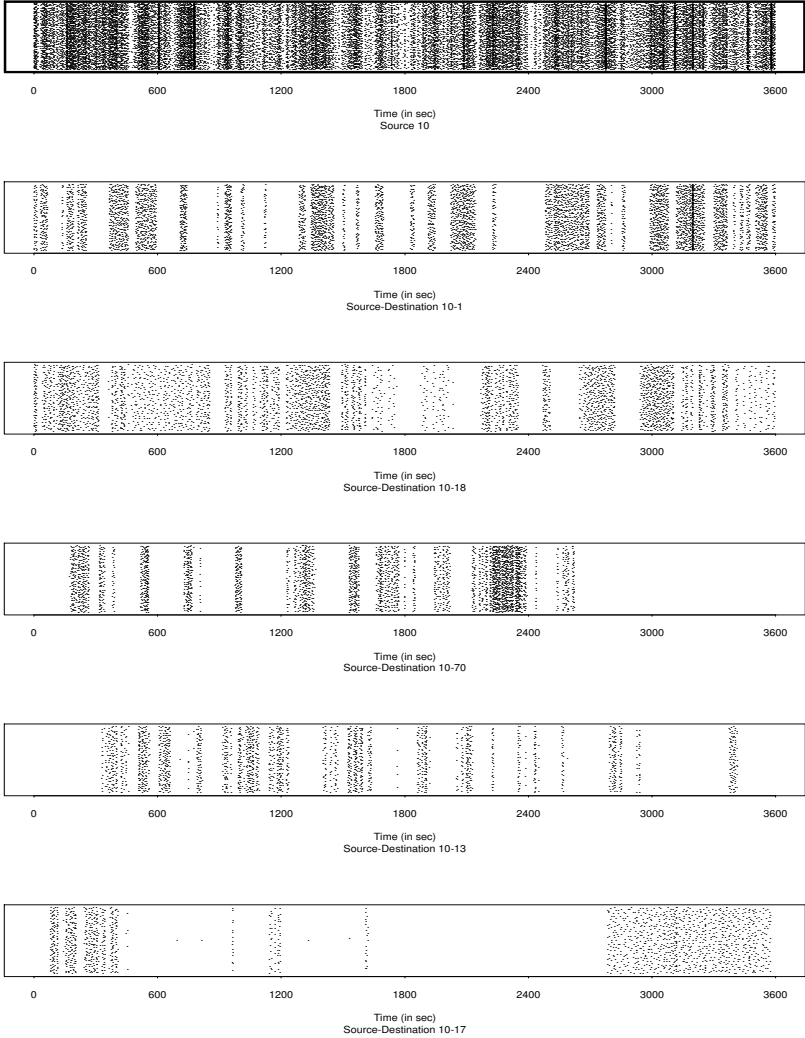


Figure 2: Textured plots of packet arrival times for (top to bottom) source 10 and source-destination pairs 10-1, 10-18, 10-70, 10-13 and 10-17.