Johns Hopkins Engineering

625.464 Computational Statistics

Representing the 3rd Dimension

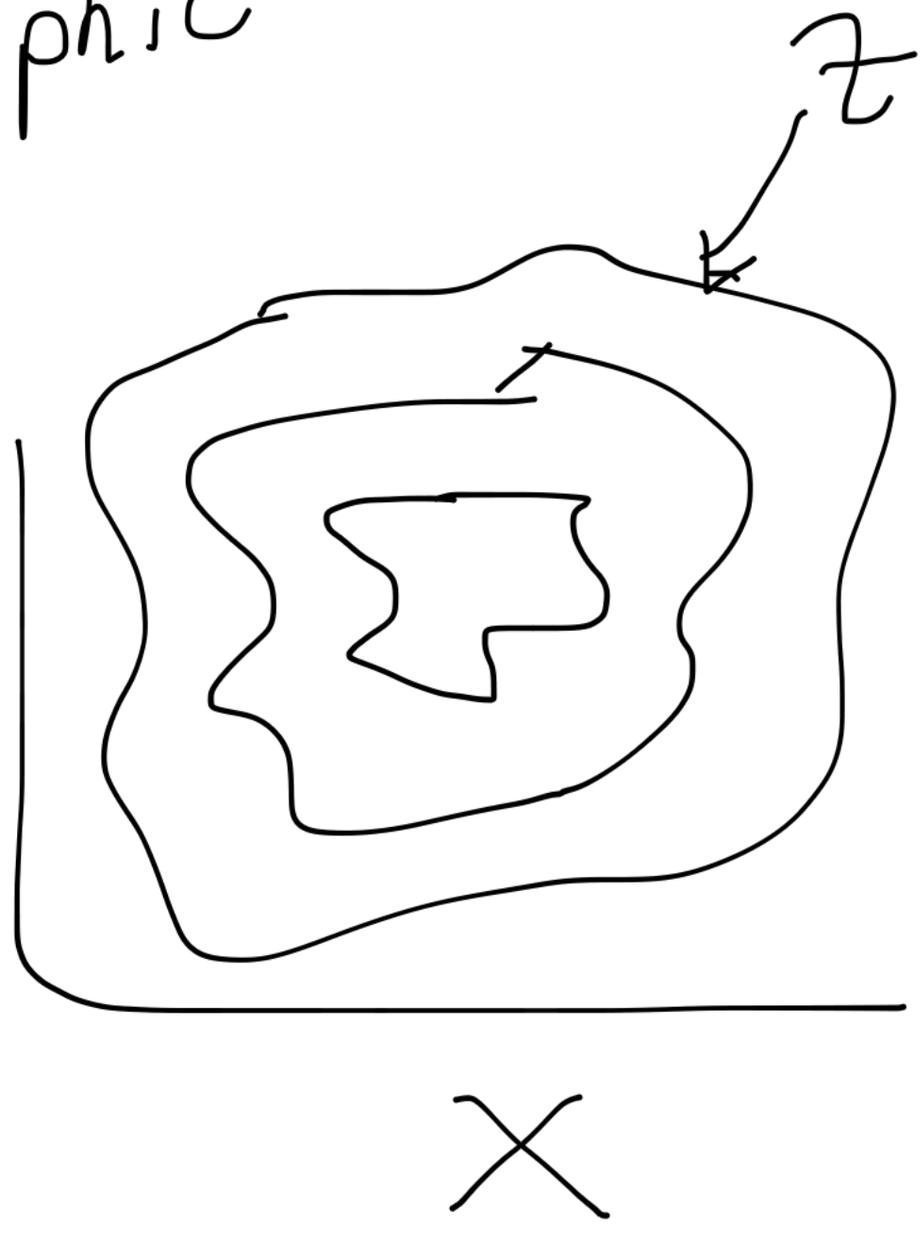
Module 13 Lecture 13C

JOHNS HOPKINS
WHITING SCHOOL
of ENGINEERING

Contour Plots

- Represents 3-dim in a 2-dim graphic

Ex/ (x, y, z)

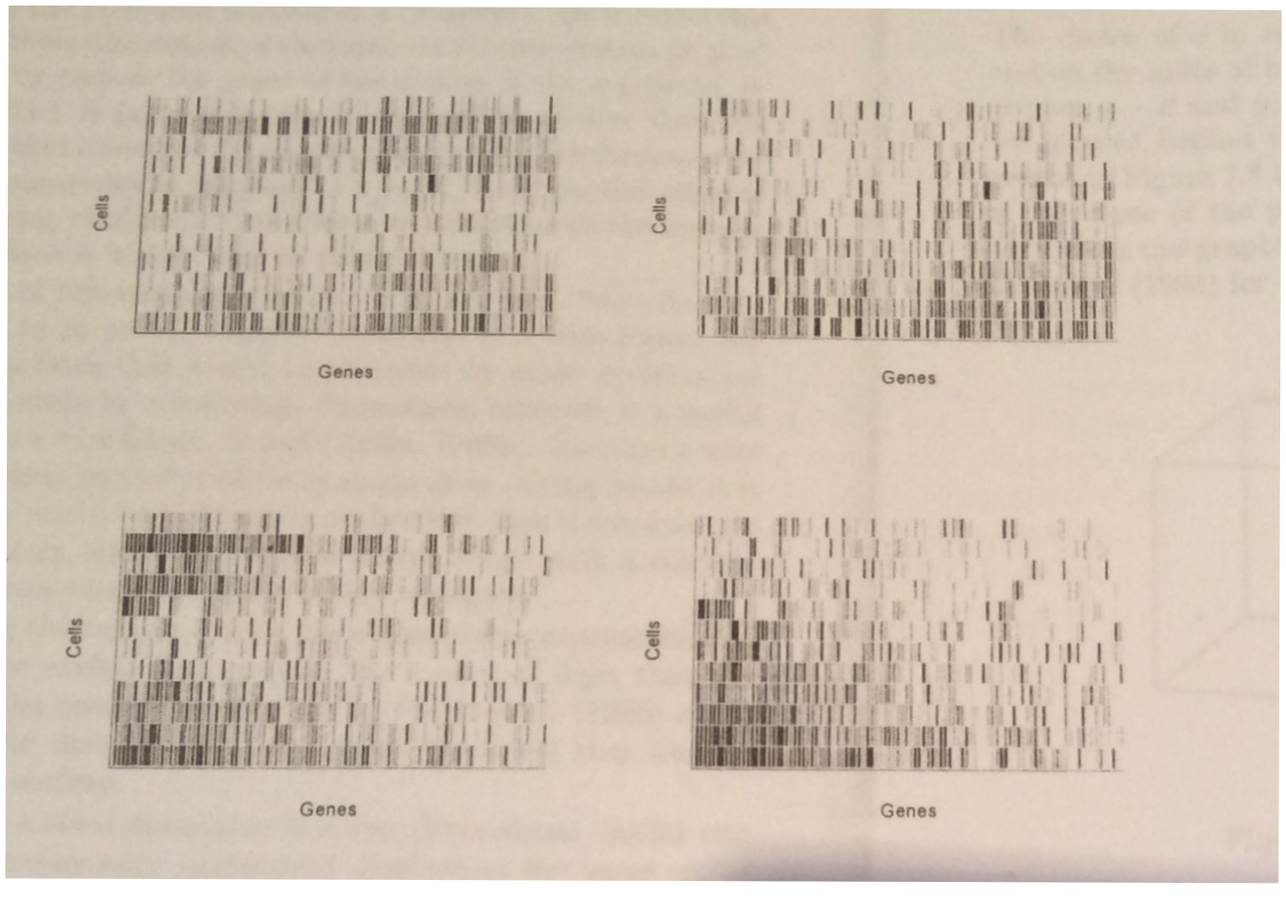


Contour line or band rep. a path over which the values of 3rd dim. are constant.

particularly useful if one dim/var is dep on the others

Image Plots

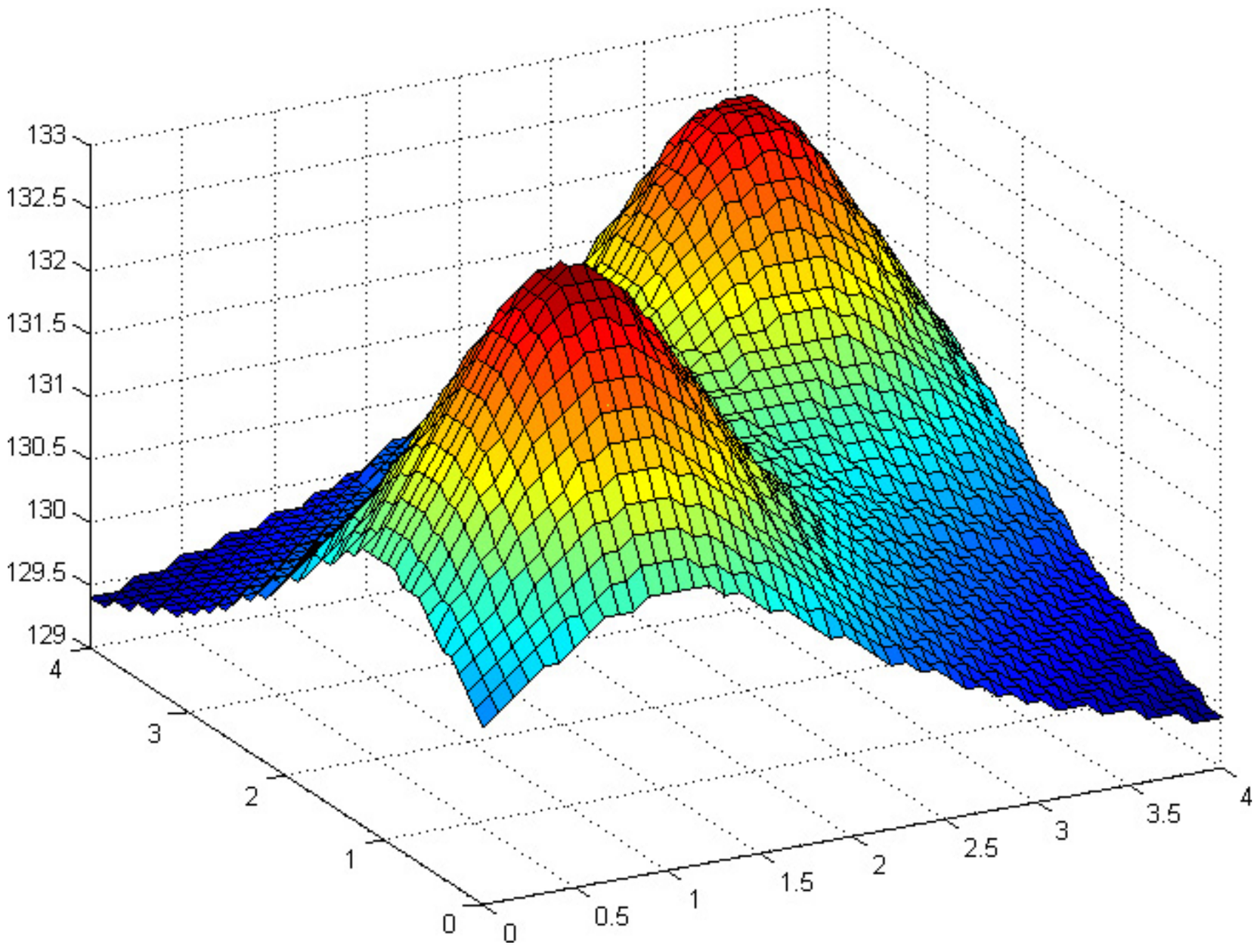
- the 3rd dim is rep. by color or a gray scale.
- useful in identifying structural dep.
- reorder the "ind" axes has a major effect



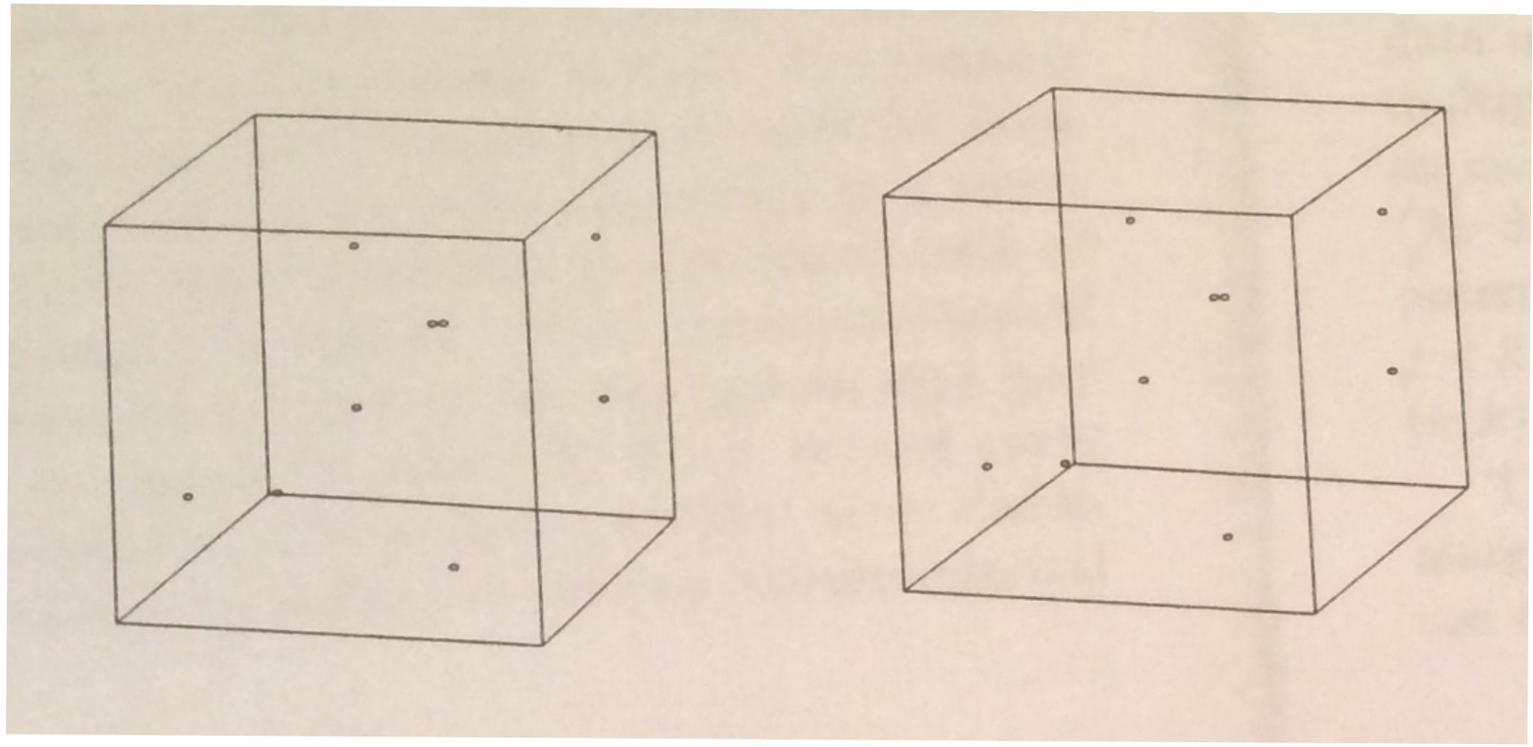
Data rep gene expression for 500 genes in 60 cells.

R can produce both contour plots and image plots

3-D Rendering



Stereograms



(X, Y, Z) - side by side views

and z depth. The values of X are offset by an amount proportional to the depth.

the depth at point i $d_i = c(z_{max} - z_i)\frac{x_{max} - x_{min}}{z_{max} - z_{min}}$

$(x-d, y)$ on left

$(x+d, y)$ on right

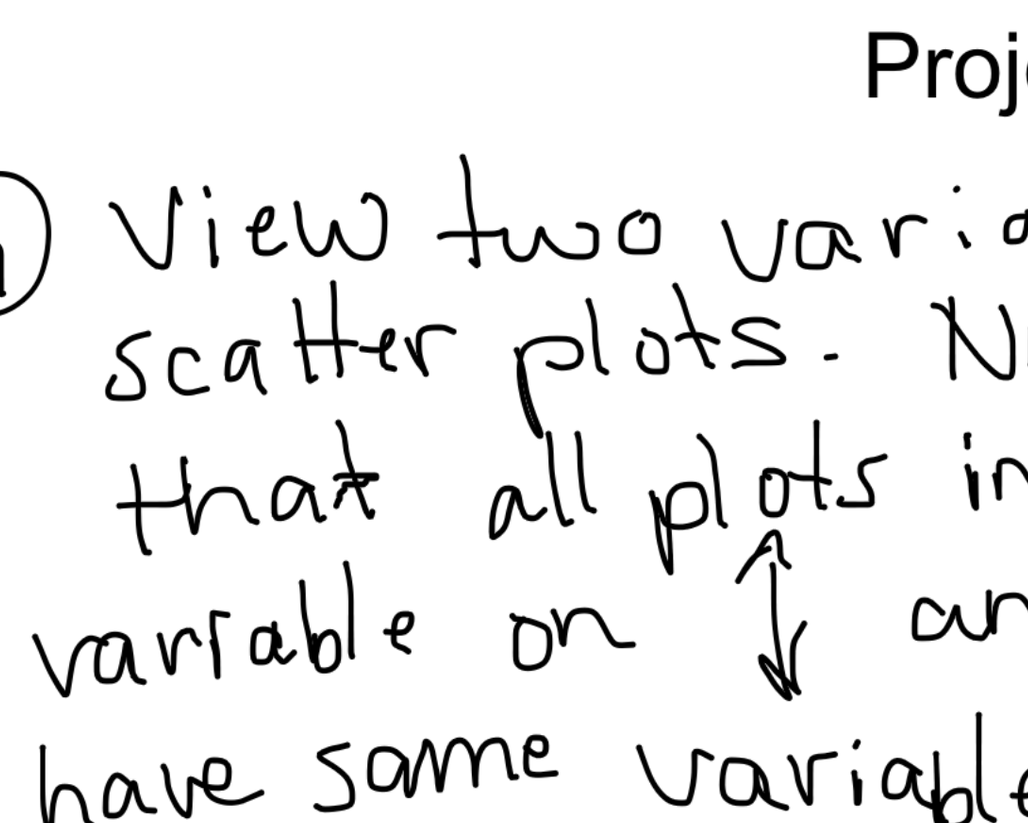
Viewing Multivariate Data

(1) use multiple 2-d views / proj into cartesian plane $O(d^2)$

(2) use other types of graphical obj w/ char assoc. w/ each of the variables small dataset

Projections

(i) View two variables at a time using scatter plots. Nice to arrange plots so that all plots in same row have same variable on ↕ and all plots in same col have same variable on ↔ SPLOM



(ii) IMPLOM