



Object Oriented Data Analysis of Cell-Well Structured Data

Xiaosun Lu, J. S. Marron, Perry Haaland

(Submitted on 19 Mar 2013)

Object oriented data analysis (OODA) aims at statistically analyzing populations of complicated objects. This paper is motivated by a study of cell images in cell culture biology, which highlights a common critical issue: choice of data objects. Instead of conventionally treating either the individual cells or the wells (a container in which the cells are grown) as data objects, a new type of data object is proposed, that is the union of a well with its corresponding set of cells. This paper contains two parts. The first part is the image data analysis, which suggests empirically that the cell-well unions can be a better choice of data objects than the cells or the wells alone. The second part discusses the benefit of choosing cell-well unions as data objects using an illustrative example and simulations. This research suggests that OODA is not simply a frame work for understanding the structure of the data analysis. It leads to useful interdisciplinary discussion that gives better results through more appropriate choice of data objects, especially for complex data analyses.

Subjects: **Statistics Theory (math.ST)**; Applications (stat.AP)

Cite as: [arXiv:1303.4767](#) [math.ST]

(or [arXiv:1303.4767v1](#) [math.ST] for this version)

Submission history

From: Xiaosun Lu [[view email](#)]

[v1] Tue, 19 Mar 2013 20:55:31 GMT (6768kb,D)

[Which authors of this paper are endorsers?](#)

Download:

- [PDF](#)
- [Other formats](#)

Current browse context:

math.ST

[< prev](#) | [next >](#)

[new](#) | [recent](#) | [1303](#)

Change to browse by:

[math](#)

[stat](#)

[stat.AP](#)

References & Citations

- [NASA ADS](#)

Bookmark([what is this?](#))

