NITRD Frontiers of Visualization

Claudio T. Silva
Head of Disciplines, Center for Urban Science + Progress (CUSP)
Professor
Polytechnic School of Engineering
Center for Data Science (CDS)
Courant Institute for Mathematical Sciences
New York University

http://bigdata.poly.edu/~csilva http://engineering.nyu.edu
http://cusp.nyu.edu http://cds.nyu.edu http://www.cims.nyu.edu

Funded by grants/gifts from CUSP, Poly, Moore and Sloan Foundations, NSF, NASA, DOE, and IBM

NYU POLYTECHNIC SCHOOL OF ENGINEERING

CUSP CENTER FOR URBAN SCIENCE + PROGRESS

Who are you and what are you doing with visualization?

Background: Computer scientist/applied math; studied and/or worked at Stony Brook, Sandia, LLNL, IBM, AT&T, Utah, currently professor at NYU.

Prior Work: Visualization algorithms & representations; toolkits & systems (e.g., VisTrails, BirdVis, DEFOG, PedVis, UV-CDAT, HyperFlow, HAVS); and visualization evaluation (correctness & effectiveness).

Current Focus: Urban Data Analysis & Climate Data Analysis

What are you passionate about?

Substantially improve "users" (scientists, for the most part) productivity in data-driven discovery by designing tools (including software, methods, and new concepts) that help them explore and better understand their data.

What are your current challenges in your work?

- Improve usability of data analysis tools so that they can be "used" by scientists; the community has created too many tools that only visualization researchers are able to use.

- Ensure correctness & effectiveness of techniques and implementations; see T. Etiene's [2013] & E. Anderson's [2012] PhD theses.

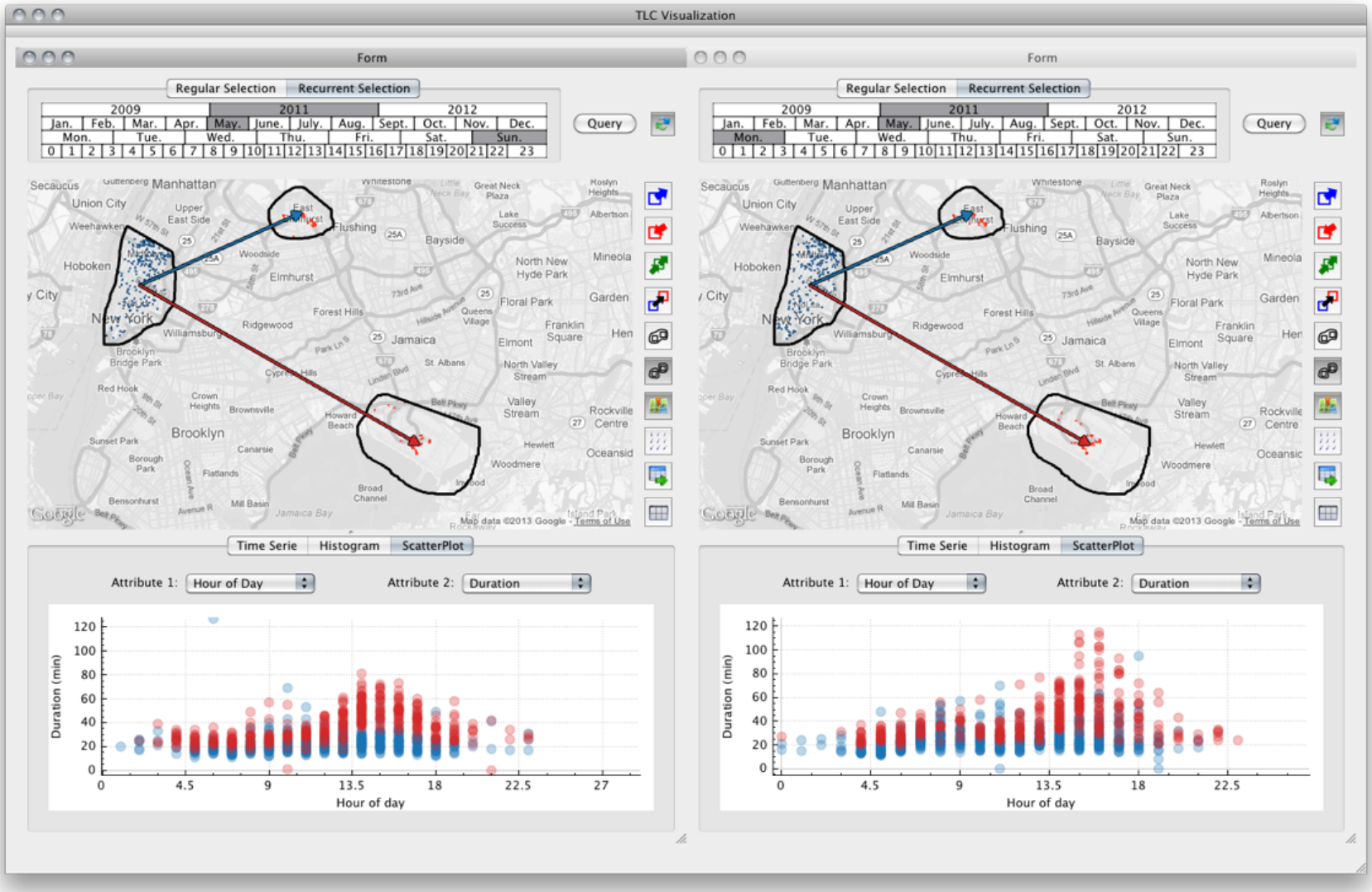
- Integrate of visualization techniques with other areas needed for analytics, notably data management and machine learning.

- Develop sustainable, usable, and open software.

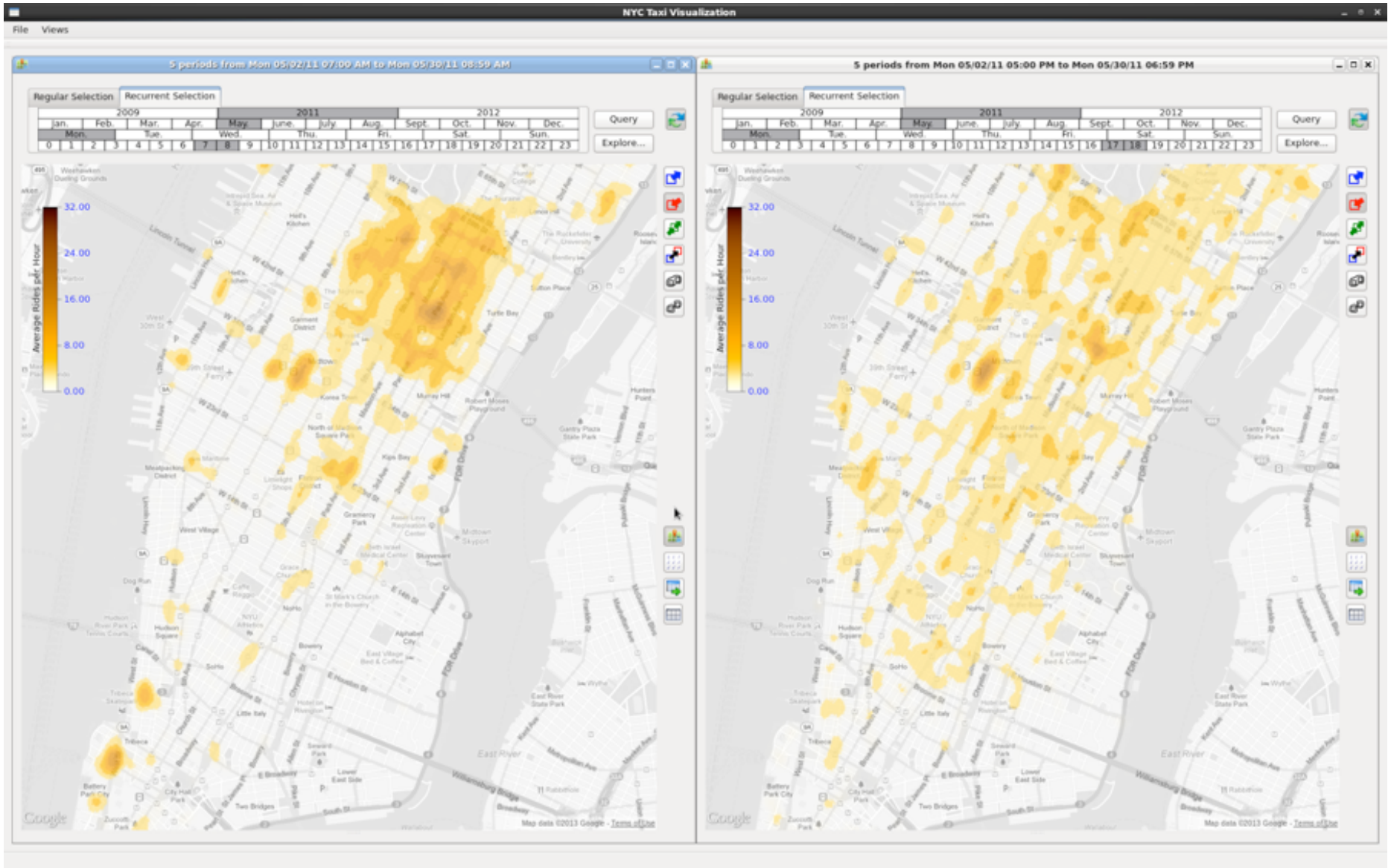
What is on your wish list?

- "Move the needle" on Urban Data Analysis (challenges include: spatial-temporal, diverse data sets, different scales, dimensionality, etc).
- Enable reproducible data-driven discovery.
- Educate scientists (and also citizens) on the use of data analysis and visualization techniques.
- Contribute to open-source, widely-used tools for supporting the analytics process.

Interactive Visual Exploration of NYC Taxi Records



Dropoffs Before vs. After Work

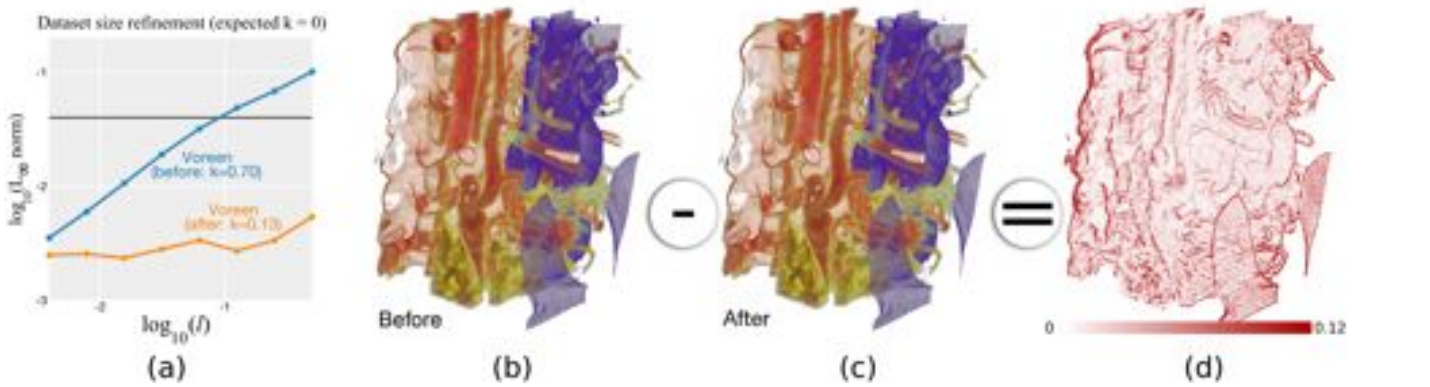


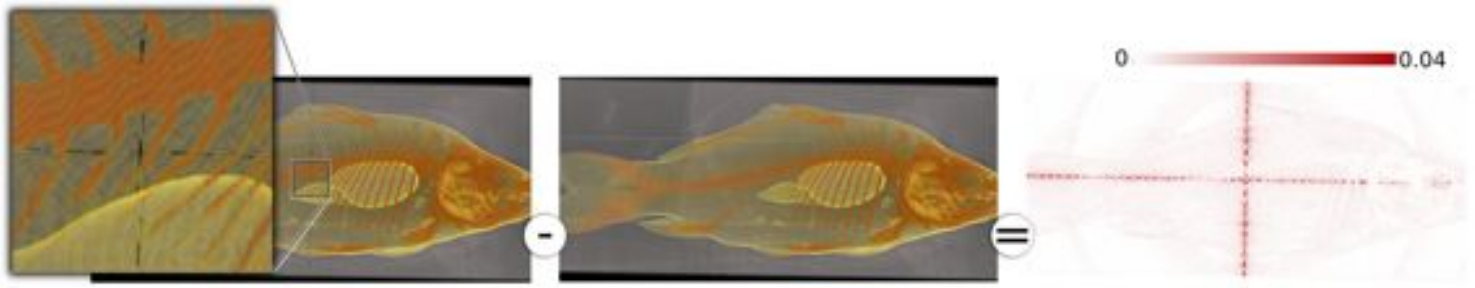
TOWARDS THE THEORY AND PRACTICE OF VERIFYING VISUALIZATIONS

Tiago Etiene

Doctor of Philosophy

The University of Utah





NYU POLYTECHNIC SCHOOL OF ENGINEERING

Packing Experiments for Sharing and Publication

Fernando Chirigati
Polytechnic Institute of NYU
fchirigati@nyu.edu

Dennis Shasha
New York University
shasha@cs.nyu.edu

Juliana Freire
Polytechnic Institute of NYU
juliana.freire@nyu.edu

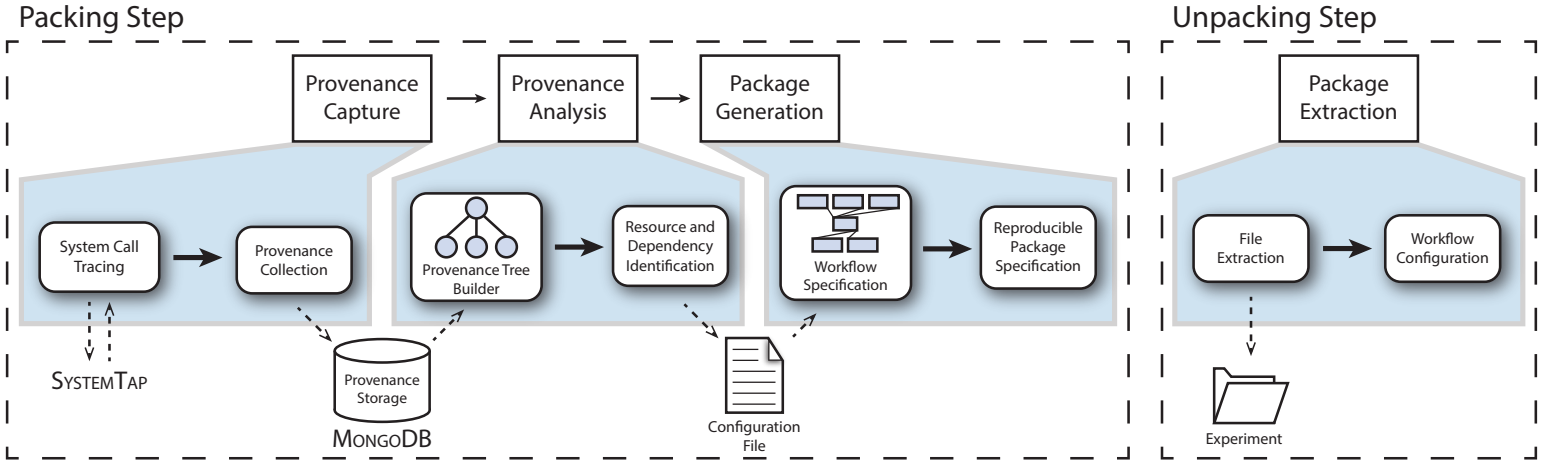


Figure 1: Architecture of ReproZip.