



Giovanni

<http://giovanni.gsfc.nasa.gov/>



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Outline



- ☞ What is Giovanni?
- ☞ Motivations & Overview
- ☞ Collaboration and Sharing of Data Analysis
- ☞ Giovanni Portals, Micro-sites and Apps
- ☞ Lessons Learned
- ☞ Going Forward



What is Giovanni?



- ☞ Stands for **G**ES-DISC (Goddard Earth Sciences Data and Information Services Center) **I**nteractive **O**nline **V**isualization **A**Nd a**N**alysis **I**nfrastructure
- ☞ An online framework for Earth Science Data
 - ☞ Analysis
 - ☞ Visualization
 - ☞ Access
- ☞ Lofty Goal: Transform tedious data exploration into an easy to use fast online experience

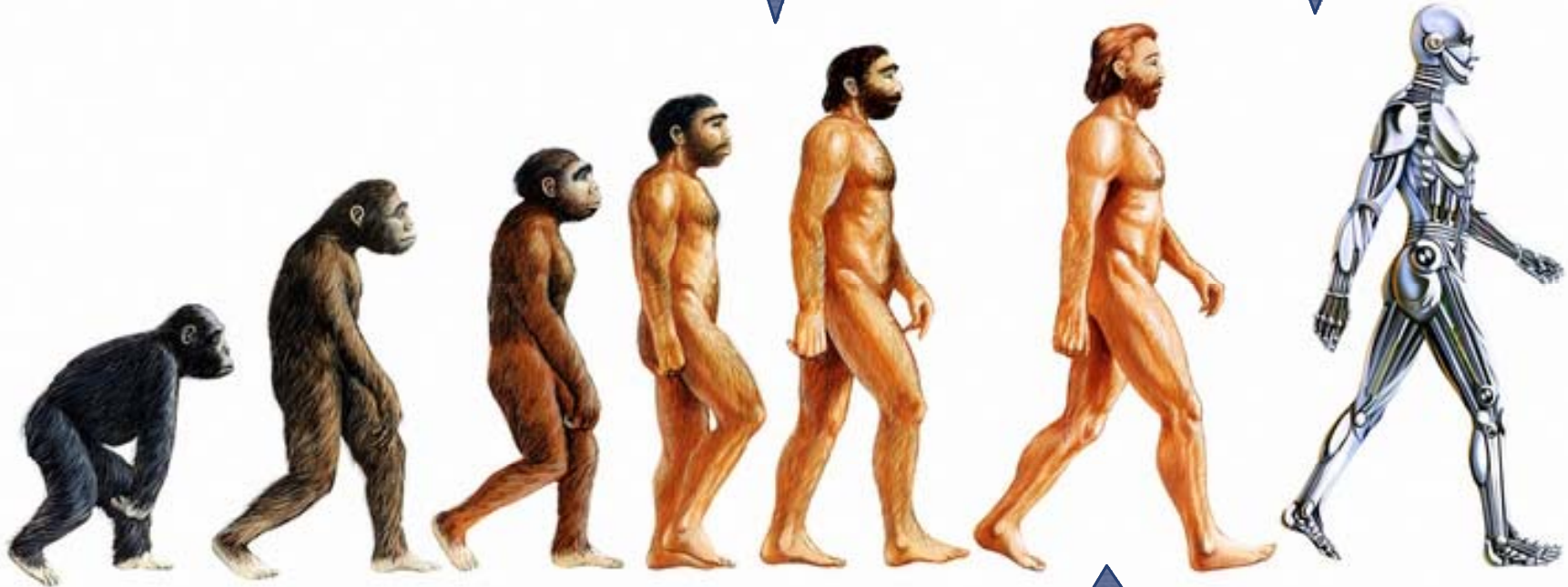


Evolution of Giovanni



Giovanni-2

Giovanni-4?



Giovanni-3



Motivations for Giovanni-4



- ∞ Improve user experience
- ∞ Reduce time-to-market for new services and data
- ∞ Leverage off-the-shelf components and services
- ∞ Separate data analysis and visualization
- ∞ Improve usability and reliability



Deviations from Giovanni-3



- ⌘ Rich Interactive Application
 - ⌘ Component model for reusable GUI widgets
- ⌘ Standards based data models using
 - ⌘ netCDF format
 - ⌘ CF-1 conventions
- ⌘ Off-the-shelf workflow engine (Kepler)
- ⌘ Data Model based Visualizations (~MVC)
- ⌘ Off-the-shelf tools for data analysis (nco, OPeNDAP, ...)
- ⌘ Works with point, Level-2, Level-3 data



gSocial

Collaboration and Sharing of Data Analysis



- ⌘ A framework with bookkeeping, sharing and collaboration of data analysis
- ⌘ Based on Drupal 6
 - ⌘ Incorporates Talkoot Research Notebook from UAH
- ⌘ Despite its name, *gSocial can be integrated with other REST-based applications*



Collaboration Features



- ☞ Services are URL addressable (=can be bookmarked, shared ..)
- ☞ Save service settings (tag, comment, share a la Facebook)
- ☞ Tag, annotate and categorize an interesting feature and/or anomaly in a plot
- ☞ Provide user with list of tags (created by other users) for similar datasets
- ☞ Ability to re-run data analysis from other user tags



Giovanni Portals-Examples



- ☞ Omnibus portal for all of Giovanni data and services
 - ☞ Giovanni (<http://giovanni.gsfc.nasa.gov/beta/giovanni/>)
- ☞ Community Specific Portals
 - ☞ AeroStat (<http://giovanni.gsfc.nasa.gov/aerostat/>)
 - ☞ MAPSS (<http://giovanni.gsfc.nasa.gov/mapss/>)
- ☞ Micro-site
 - ☞ AeroStatMap (<http://giovanni.gsfc.nasa.gov/beta/AerostatMap/>)
- ☞ Mobile Apps
 - ☞ AeroStat app expected at the end of summer.



Lessons Learned



- ☞ Performance is what makes an online analysis application a “killer app”
- ☞ Use of netCDF/CF-1 data format opened up data access via wide variety of tools: Panoply, IDV, nco, ...
- ☞ Don't re-invent; reuse!
 - ☞ OPeNDAP for sub-setting and format conversion
 - ☞ Simple Subset Wizard for data search and sub-setting
 - ☞ JCS for data caching
 - ☞ Kepler for workflow engine
 - ☞ nco for manipulating and processing netCDF
 - ☞ YUI for constructing UI widgets



Lessons Learned



- ❧ Data is not ready for consumption by applications
 - ❧ Lack of common standards and adoption of standards when available
 - ❧ User still has to go through hoops to extract usable data out of files

- ❧ Off-the-shelf component != zero cost; limitations are not well understood upfront.
 - ❧ Scientific data analysis is a different beast than commercial applications. Example: data volume in caching
 - ❧ Kepler: lack of web service API, provenance, logging, job control, debugging
 - ❧ OPeNDAP: lack of standards in error handling



Going Forward...



- ☞ Mobile apps
- ☞ Community specific micro-sites
- ☞ Interactive client side visualization and exploration
- ☞ Use of better workflow engine
- ☞ Expose services using standard protocols (WMS, WCS, KML)



In Memory Of

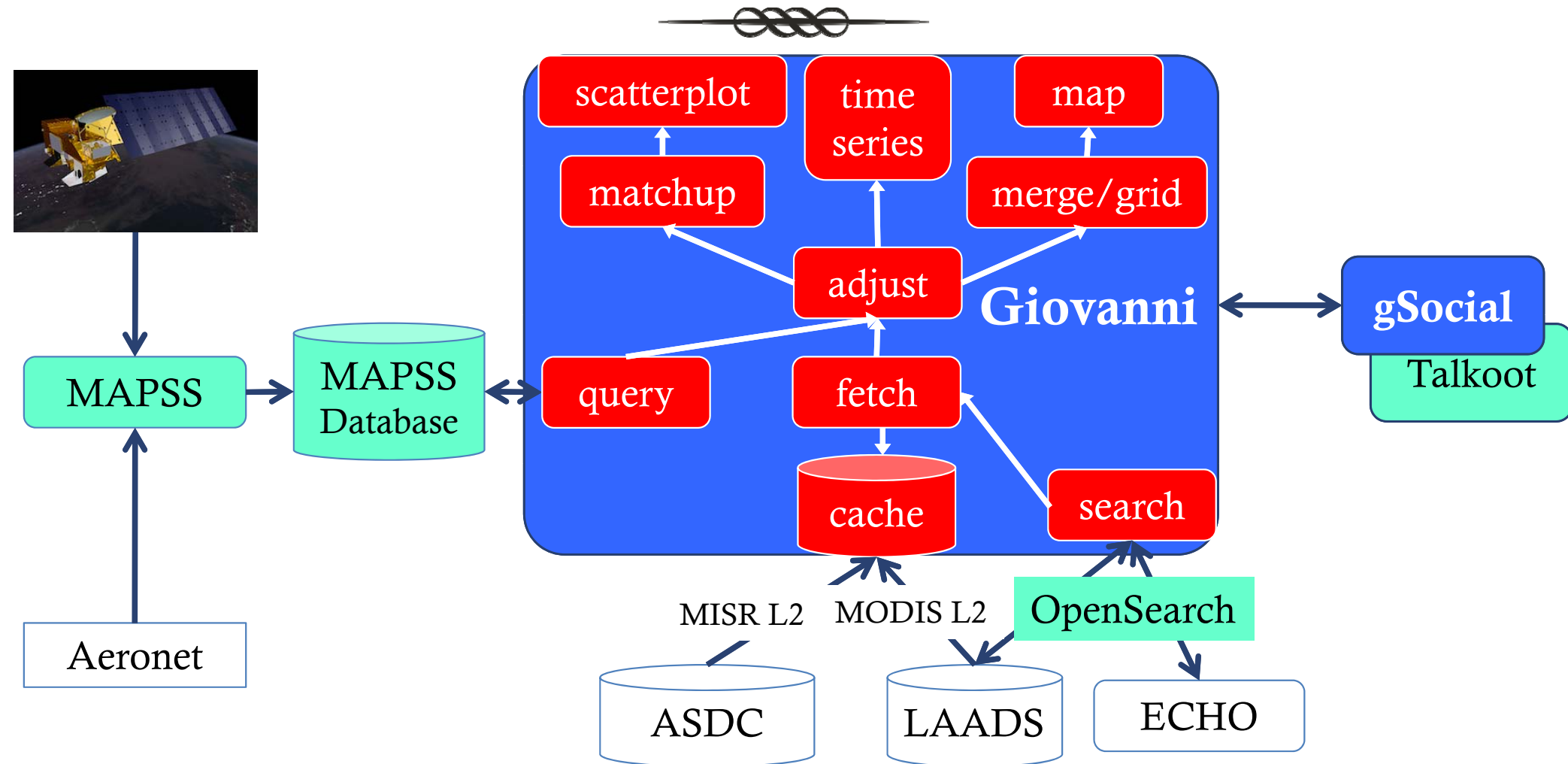


Greg Leptoukh (1953-2012)



AeroStat

Inter-comparison of stations and Level-2 data



Aeronet: AErosol RObotic NETwork

ECHO: EOS Clearinghouse

MAPSS: Multi-sensor Aerosol Products Sampling System

ASDC: Atmospheric Science Data Center (LaRC)

LAADS: Level 1 and Atmosphere Archive and Distribution System