

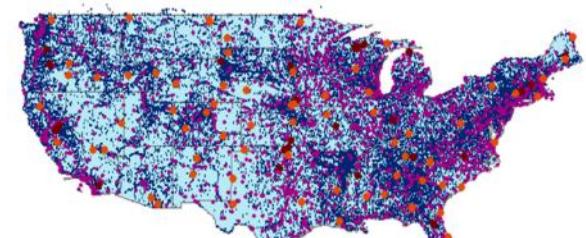
Survey Analysis with SuAVE

Jan 19, 2021

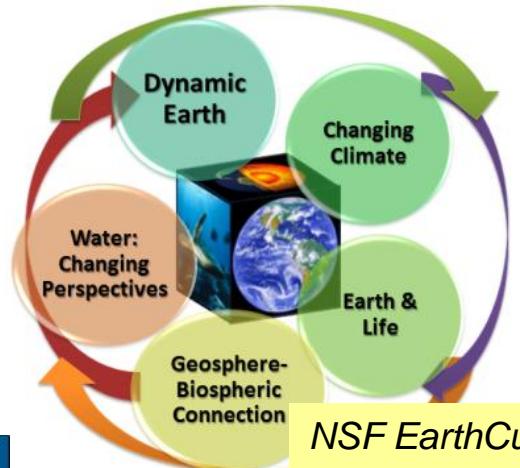
Ilya Zaslavsky
Director, Spatial Information Systems Lab
San Diego Supercomputer Center, UCSD

SDSC Spatial Information Systems Lab

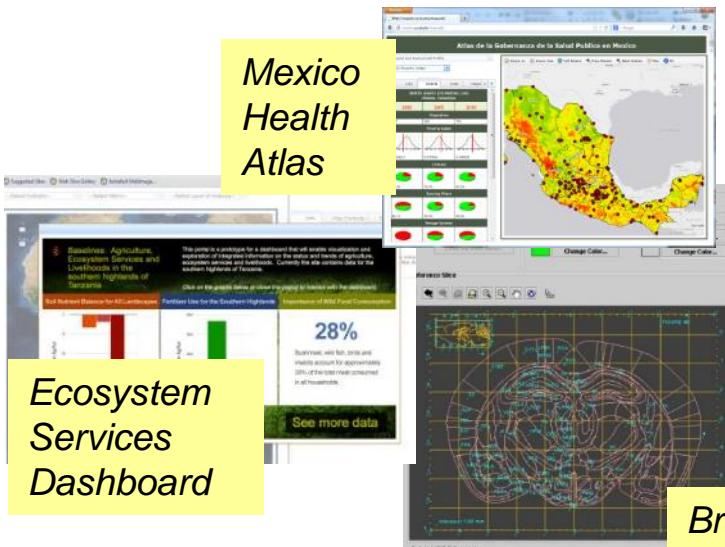
- Spatial data integration
- Interoperability and data standards
- GIS and Geospatial Databases
- Information discovery across distributed sources
- Online analysis systems
- Survey data analysis



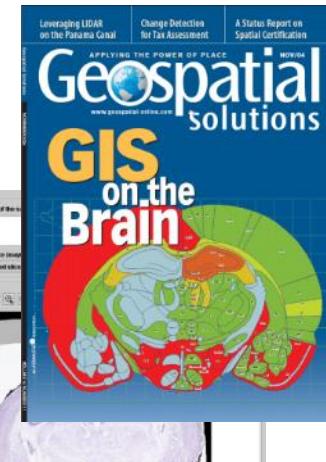
Hydrologic Information System
(largest in the world)



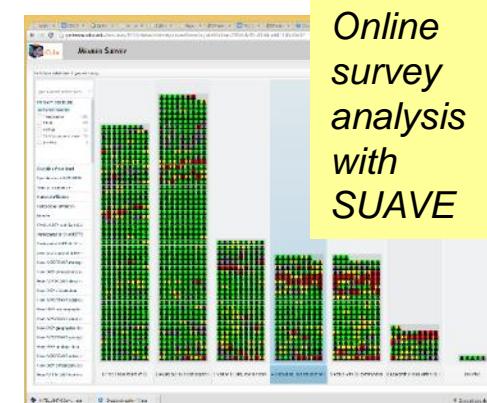
NSF EarthCube



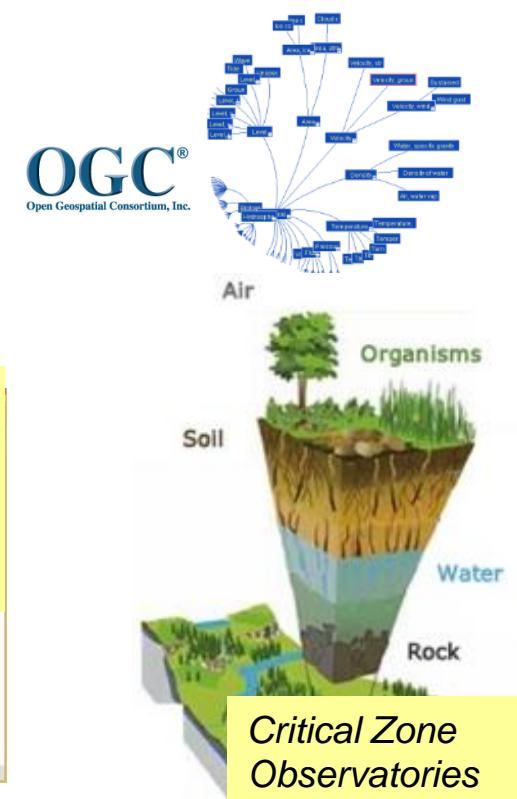
Ecosystem Services Dashboard



Brain data integration



Online survey analysis with SUAVE



Critical Zone Observatories

SuAVE

Survey Analysis via Visual Exploration

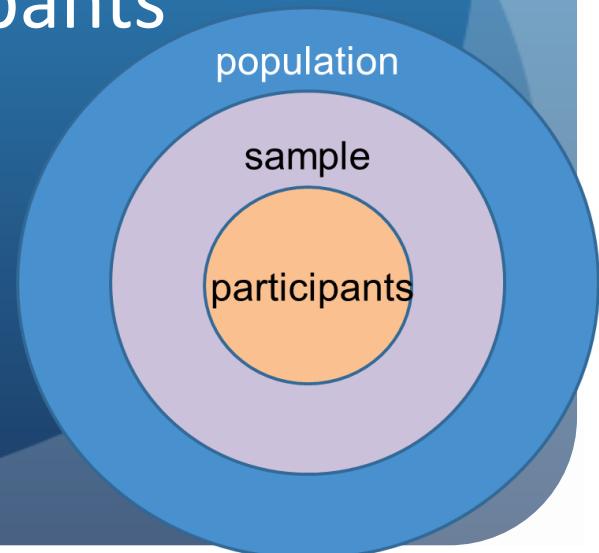
a new online system for
visual analysis of surveys
and image collections



<http://suave.sdsc.edu>

Survey analysis: many components! (1)

1. What is a survey (not just a questionnaire!)
2. Guiding questions (What exactly do you want to find out? And why? How will you use this info?) *don't do it just because it is interesting. Also see if the research questions can be answered without surveys (other data, papers, ICPSR survey archive)*
3. Institutional Review Board: federally regulated, ethical compliance
4. Sampling from a population, and survey participants
(different sampling schemes, bias adjustment, etc.)
think about electoral surveys...
5. Survey delivery methods :
in person, online, phone, mail, survey apps (but even the more expensive in-person surveys is not always a panacea)



Survey analysis: many components! (2)

- 6. Writing good questions, and selecting right types of questions. They should be understandable, in proper English. Avoid double-barreled questions. Questions should be specific.
- 7. Survey design and logic (*Demo of LimeSurvey*)
make it look simple!
- 8. Codebooks and data dictionaries
Think about how you will process survey results!
- 9. Evaluating your survey (pilots)
Always do this!!
- 10. Survey implementation (invitations, distribution)



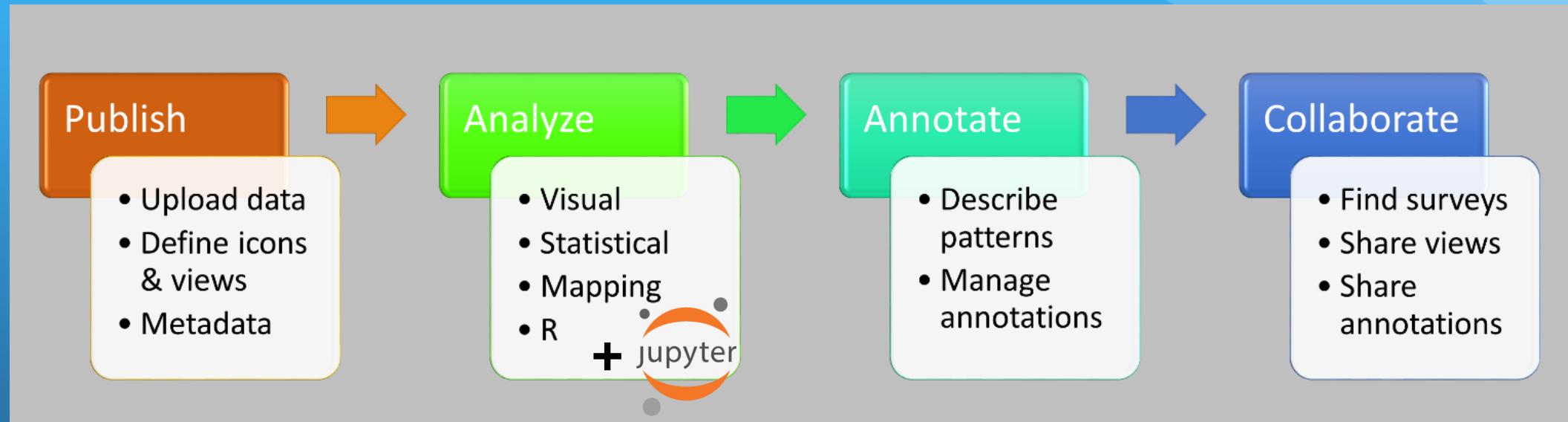
Survey analysis: many components! (3)

- 11. Survey management (response rates, incentives, reminders, etc.)
- 12. Managing the end of survey, including data cleaning, missing data adjustments, outlier detection, cross-validation, reporting, and publishing online (with PII removed)
- 13. Survey analysis methods and software, and reproducibility (eg visual analysis with SuAVE)
- 14. Other common survey analysis environments (SAS, SPSS, Excel, SRA)
- 15. Sharing survey analytics and insights, writing blogs etc. (with SuAVE)

Survey analysis: many components! (4)

- ^{16.} Survey data standards (eg DDI)
- ^{17.} Examples of surveys: National Election Survey Pilot, GSS, smaller surveys such as Tijuana health
- ^{18.} Surveys with multimedia (with SuAVE)
- ^{19.} Data science with survey data, using Jupyter notebooks (with SuAVE)
- ^{20.} Sources of survey data: ICPSR, electionstudies, Census Bureau, Roper Center, iPoll, World Bank, NHANES, GESIS (in Europe), more.

SuAVE Capabilities



Applications in:

Public Opinion Surveys • Biology and Ecology • Health Informatics •
Library Collections • Geosciences • Visual Arts • Humanities • Archaeology
• Urban Planning • Organization Management • Portfolio Analysis

suave.sdsc.edu

- SuAVE original purpose is to make survey analysis powerful, intuitive and fun!
- No learning curve
- Easy to publish data
- Extensible analysis
- Easy to tell your research story

Not secure | suave.sdsc.edu/suave-for-questionnaire-surveys-in-it-and-other-fields/

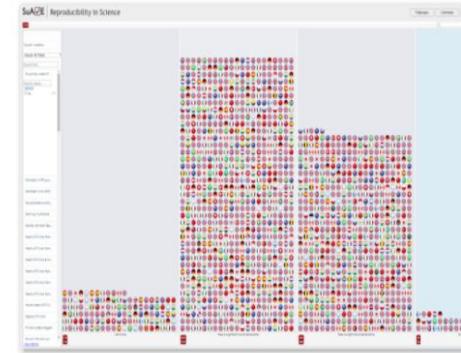
Apps Getting Started Imported Imported (1) Imported From Fire... TutorialsCV5-2_min... DDH6: Data Discov... IBM Watson ER_CBD_ABSCRHS... sdsc-labs | Powered... Other book

SuA✓E

HOME GALLERY TEACHING TUTORIALS BLOG CONTACT MY SURVEYS LOG IN

SuAVE for IT surveys

SuAVE has been used to publish, share and analyze surveys of researchers and IT professionals on topics related to open data management, reproducibility, data preservation, productivity, etc. Some of these surveys are assembled here, along with links to more common public opinion surveys.

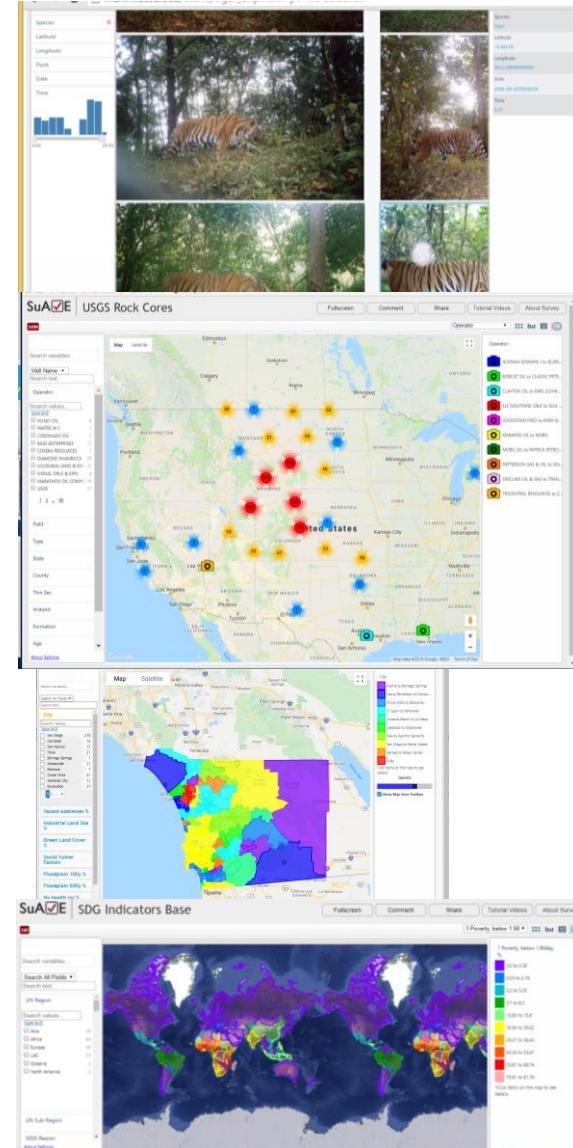
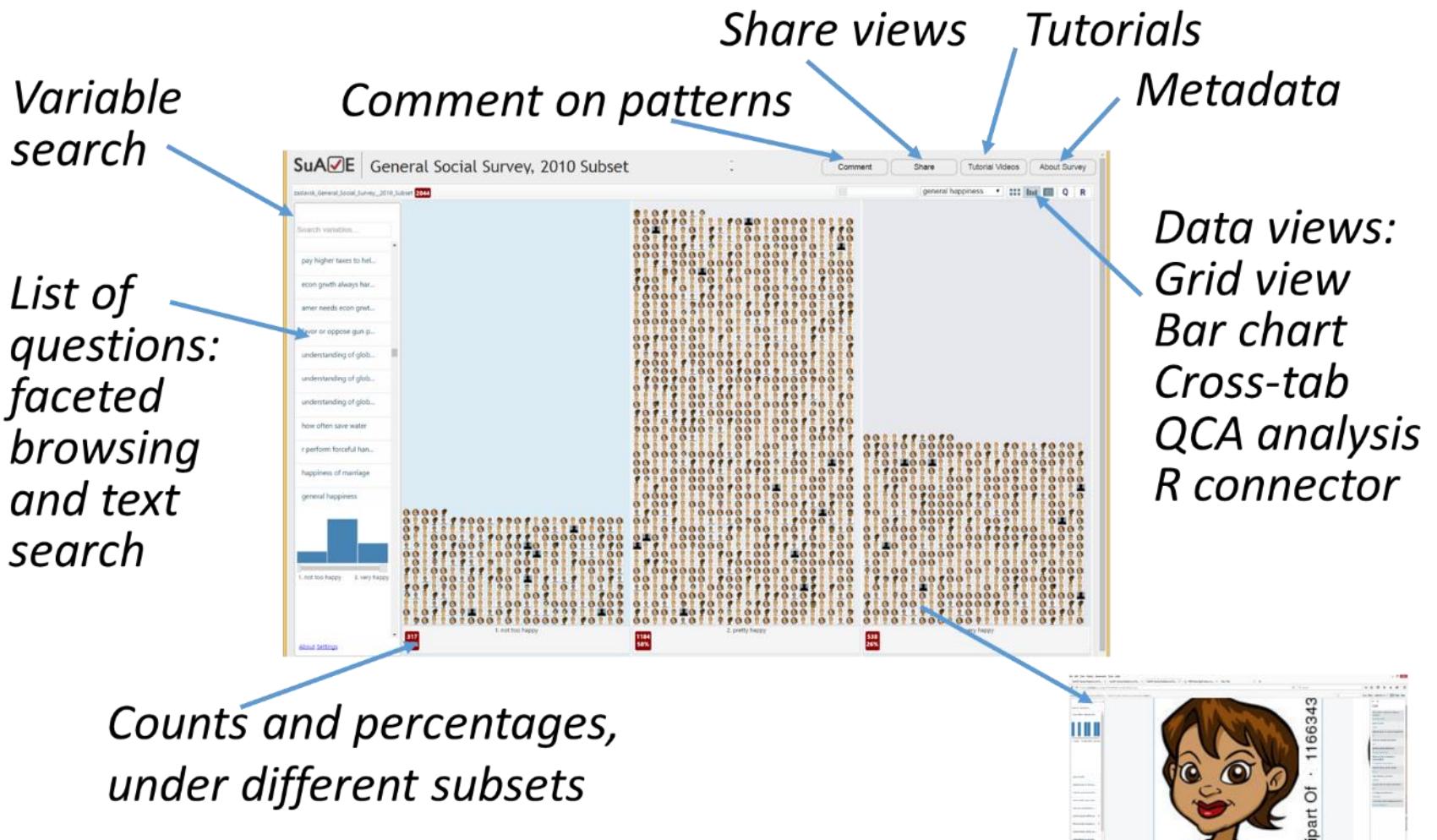


[Reproducibility in Science survey by Nature](#). The survey was conducted by Nature in November 2015, and later described in a Nature article "[1,500 scientists lift the lid on reproducibility](#)". It is interesting to explore how the reproducibility crisis is perceived by researchers in different disciplines and from different countries.



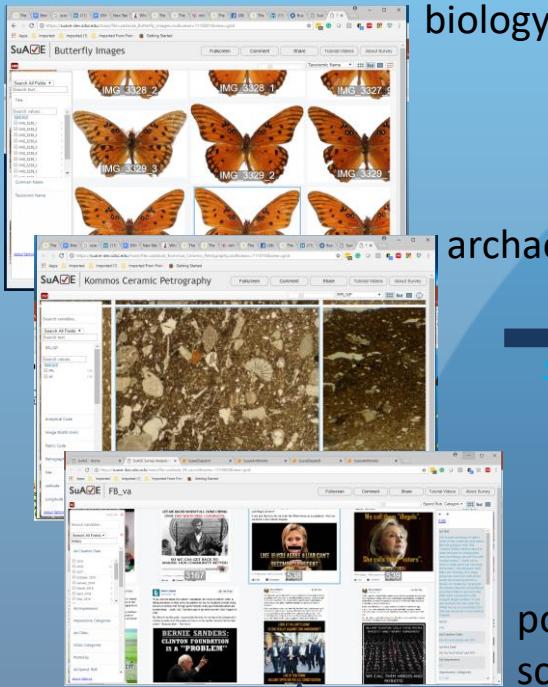
[Belmont Forum Open Data survey](#), conducted in 2014, explored the importance of multiple components of open data sharing, and barriers and burdens associated with implementation of open data infrastructure.

Visual, Statistical, Cartographic Analysis



From Data Exploration to Machine Learning (and back)

SuA✓E



survey info

archaeology

biology

political
science

computed variables



A screenshot of a Jupyter notebook interface titled 'SuAVE Image to Label SVM Prediction Model'. It contains several code cells in Python:

```
In [208]: %%javascript
    function getQueryString(key)
        return unescape(decodeURIComponent(location.search.replace(new RegExp(`(^|&)${key}=([^&]+)`), escape(key).replace(`=`, `&`))))
```

```
In [209]: %%javascript
    function getQuerystrings()
        return Object.keys(decodeURIComponent(location.search)).reduce((acc, key) => {
            acc[key] = decodeURIComponent(key);
            return acc;
        }, {});
```

```
In [210]: %%javascript
    function getSimpleVariableCalculations()
        return [
            ...new Set(getQuerystrings().map(key => key + "=" + getQueryString(key)))
        ].map(key => `var ${key} = ${key};`).join(`\n`);
```

```
In [211]: %%javascript
    function getSimpleVariableDefinitions()
        return [
            ...new Set(getQuerystrings().map(key => key))
        ].map(key => `var ${key} = ${key};`).join(`\n`);
```

```
In [212]: %%javascript
    function getSimpleVariableAssignments()
        return [
            ...new Set(getQuerystrings().map(key => key))
        ].map(key => `var ${key} = ${key};`).join(`\n`);
```

```
In [213]: %%javascript
    function getSimpleVariableInitializations()
        return [
            ...new Set(getQuerystrings().map(key => key))
        ].map(key => `var ${key} = ${key};`).join(`\n`);
```

ML: Lenet, CNNs, SVM,
etc.
Text analytics
Semantic segmentation
Image processing

Implementation of SDSC Data Science Hub:
Enabling interfaces (SuAVE)
Kubernetes containers (Jupyter)
Composable services (ML, analytics, etc.)
General service integration interfaces

Some examples

- Picasso paintings: http://suave-dev.sdsc.edu/main/file=spatialsuave_Picasso_Paintings.csv&views=1110101&view=grid
 - With colors: http://suave-dev.sdsc.edu/main/file=spatialsuave_Picasso_Colors.csv&views=1110101&view=grid
 - With concepts: http://suave-dev.sdsc.edu/main/file=spatialsuave_Picasso_Concepts.csv&views=1110101&view=grid
- Facebook Ads from Russia: http://suave-dev.sdsc.edu/main/file=spatialsuave_Russian_FB_Ads_w_Concepts.csv&views=1110001&view=grid
- Taxonomic Identification: http://suave-dev.sdsc.edu/main/file=spatialsuave_Butterflies_colors.csv&views=1110001&view=grid



DEMO 3: How to publish a survey (in SuAVE v2)

<http://suave2.sdsc.edu> → create an account

- Click “New Survey”
 - Upload a CSV file or link to a file. Give survey a name. Upload images and wait for email with link.
 - Edit a survey: define views to include, icons (if needed), dynamic text over items, etc.
 - Add survey metadata, make public (or not)
 - To share your survey - just copy the survey URL
- Manage surveys:
 - Personal survey gallery: <http://suave2.sdsc.edu/gallery/<username>>
 - See <http://suave.sdsc.edu/tutorials> (login as demo/workshop)

Demo datasets

Invitation to explore

- If interested in surveys - try SuAVE!
- Write a blog!
- If interested in elections: load election surveys from electionstudies.org and do your own research
- If interested in other types of surveys - try SuAVE!