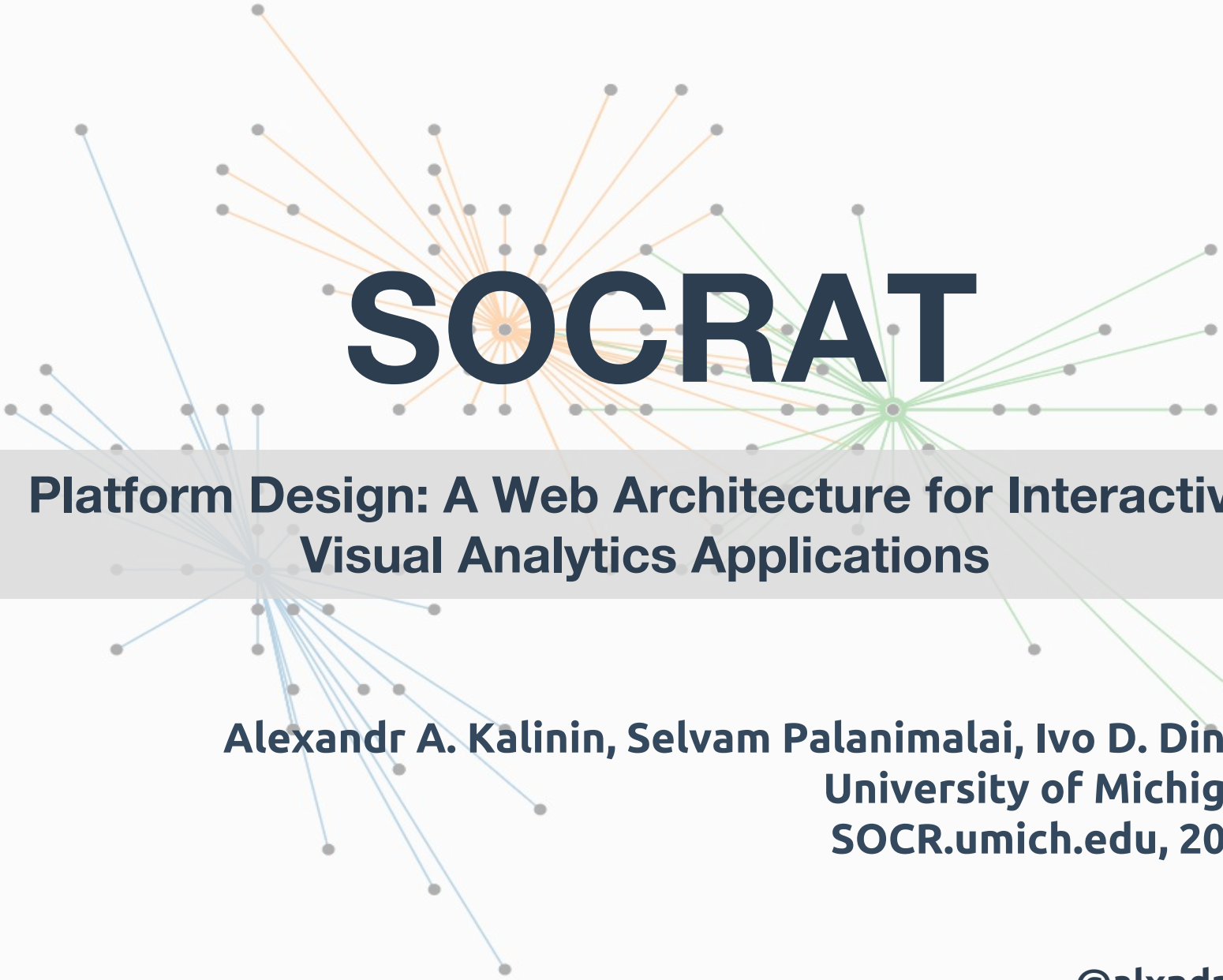


SOCRAT

Platform Design: A Web Architecture for Interactive Visual Analytics Applications

Alexandr A. Kalinin, Selvam Palanimalai, Ivo D. Dinov
University of Michigan
SOCR.umich.edu, 2017

@alxndrkalinin

Motivation

- Visual Analytics (VA) – emerging field focused on on analytical reasoning facilitated by interactive visual interfaces
- Web became successful platform for interactive apps
- SOCR.umich.edu – over 100 Java-based web-apps for modeling, analysis, and visualization
- Modern web tools: interactive visualizations (D^3, Vega), analysis (jStat, Science.js), data management (Datavore)

How can we efficiently combine existing tools and new developments to build better VA apps?

Designing VA platform

What is important specifically for VA applications?

data preparation, representation and rendering

- interactivity – central piece of any VA app
- flexibility – all VA apps are different
- efficient use of existing tools – everyone uses D^3
- automated data management (loading, storing, querying)

Design requirements

Integrative web VA system should:

- be flexible
- provide component interoperability
- allow easy extension
- be robust in runtime
- allow component reuse for various purposes
- emphasize expressiveness (allow low-level control)
- accessibility (simple protocols for creating new modules)

Design requirements

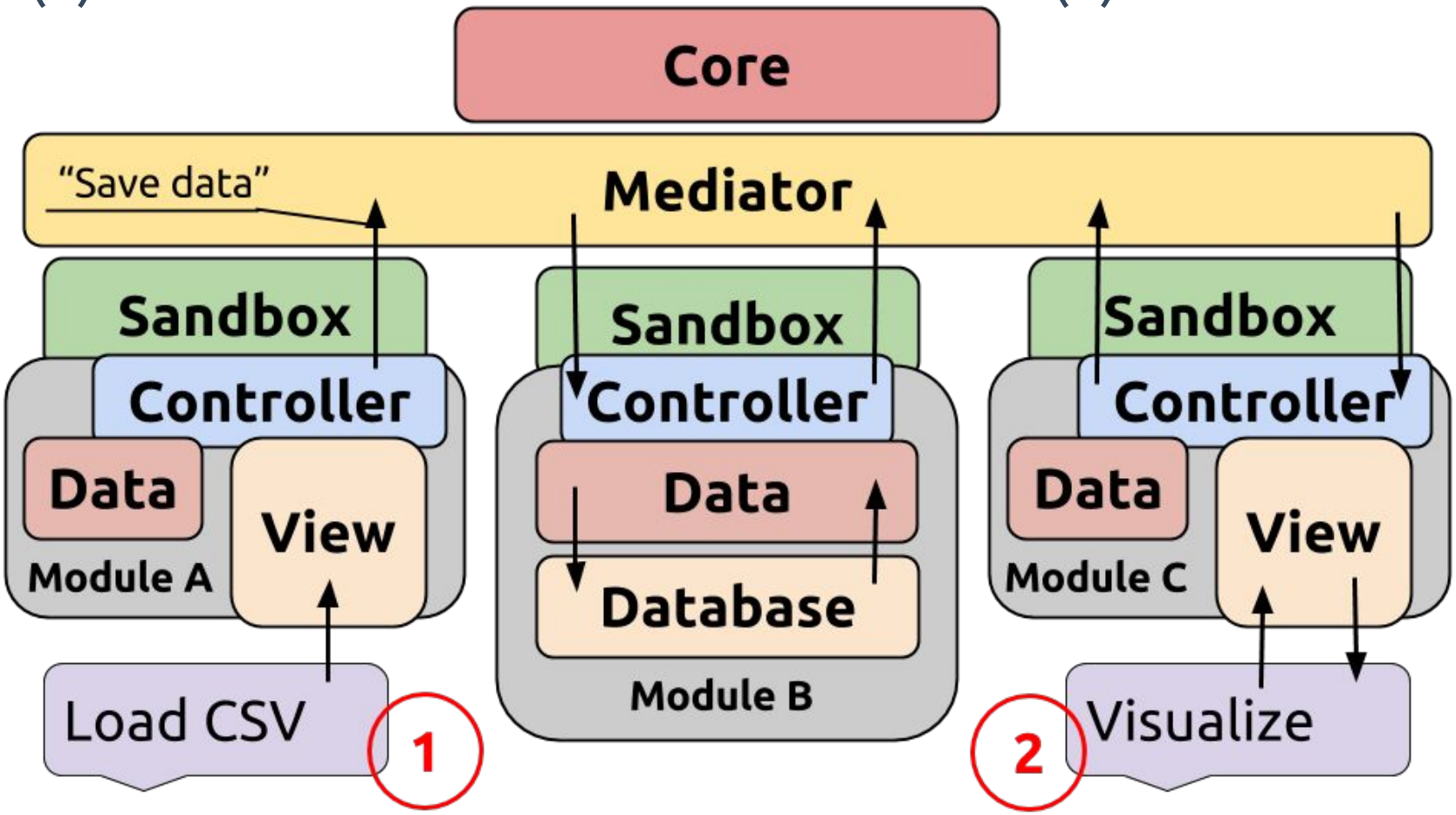
Suggested design:

- multi-level modularity:
  - system is modular
  - system components are modular
  - component modules are modular
- components are decoupled, isolated, and centrally managed (Core)
- optimized module interaction (messaging system)
- extensibility (automated integration)
- common web techniques

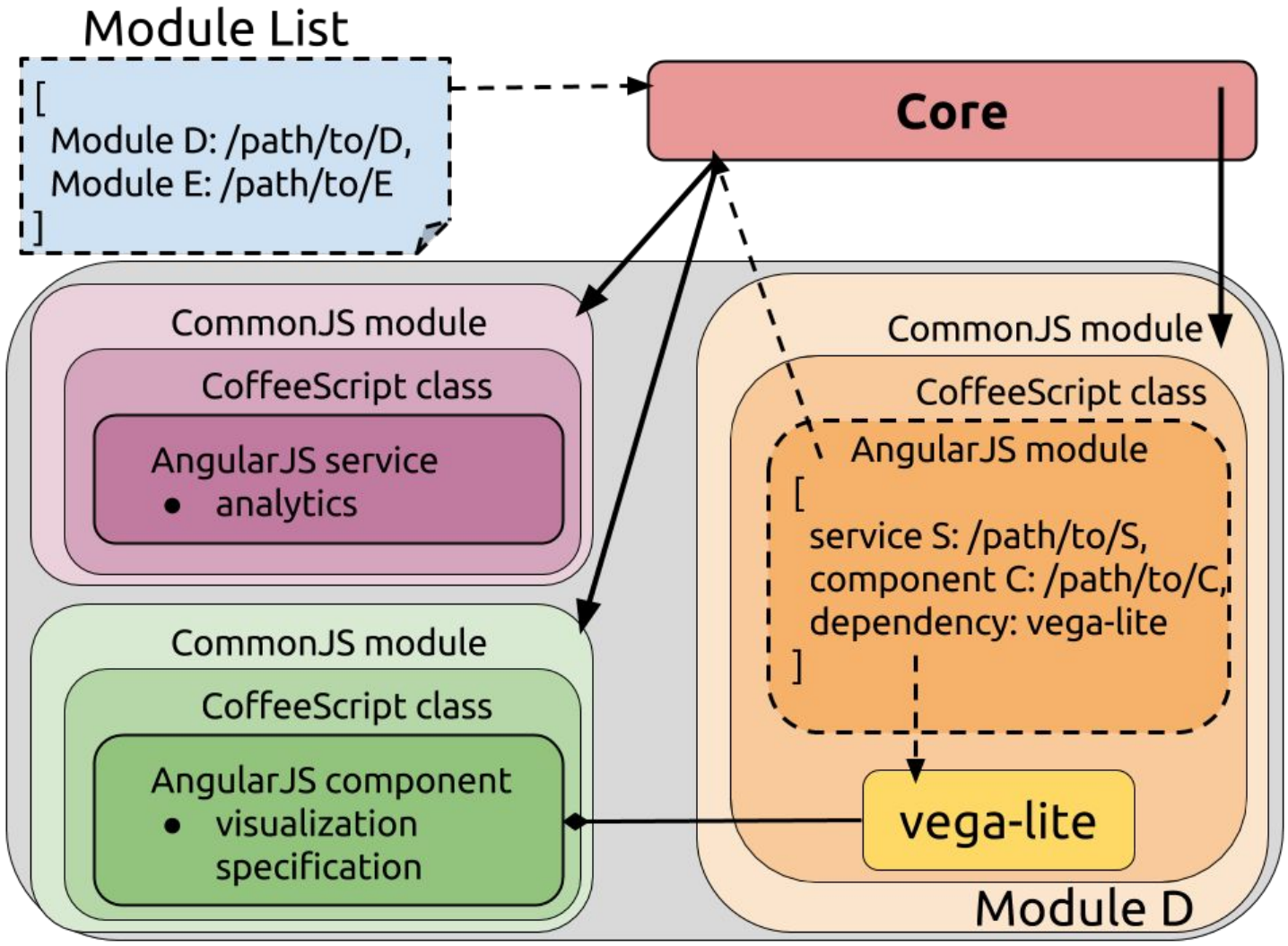
General modular platform architecture

(1) CSV to DB

(2) DB to screen



Example of module implementation



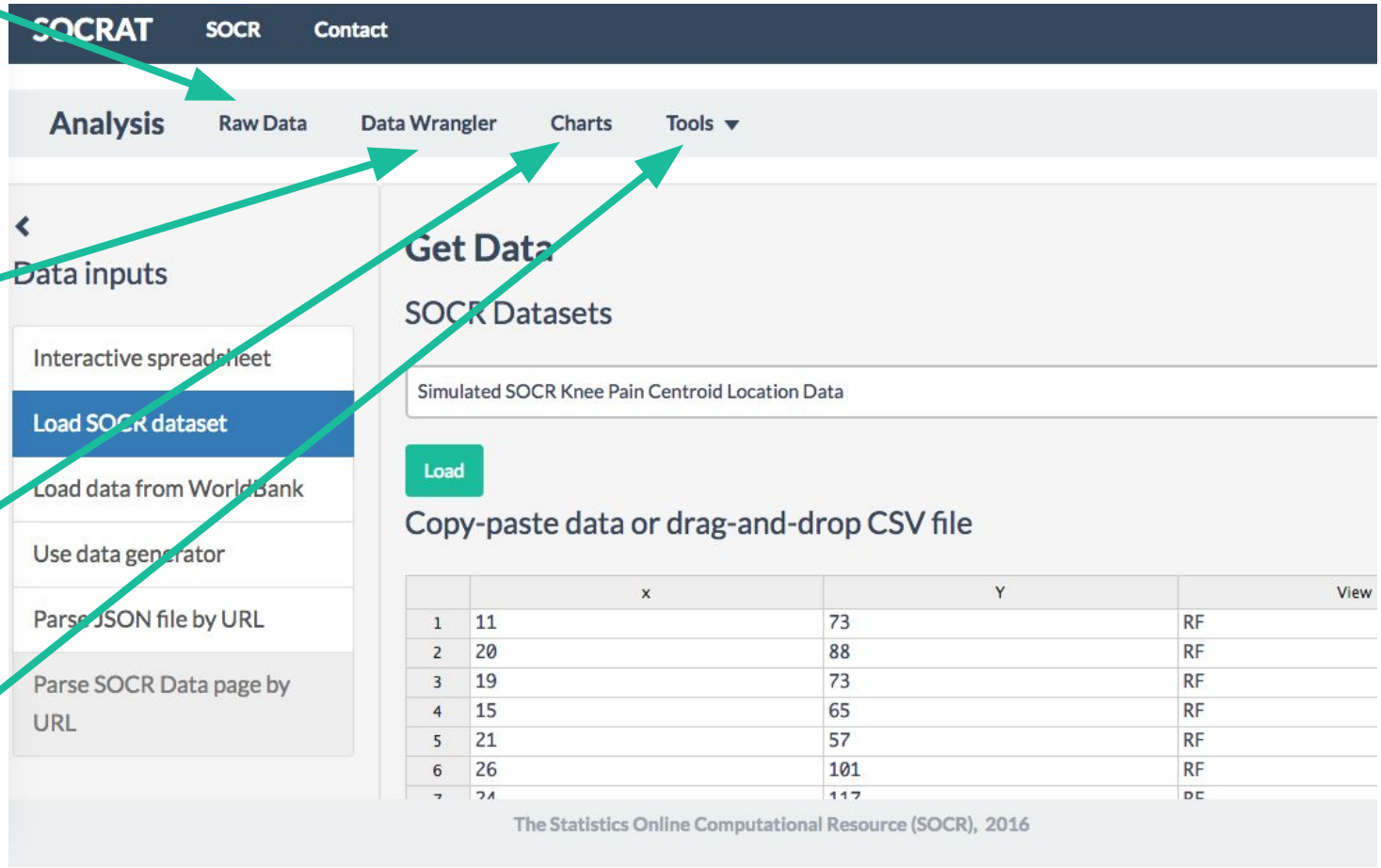
SOCR Analytical Toolbox

Load data
CVS/JSON
Drag-n-drop
APIs

Transform
Integrated
Data Wrangler

Visualize
10 different
charts

Analyse
Interactive
K-Means
Clustering



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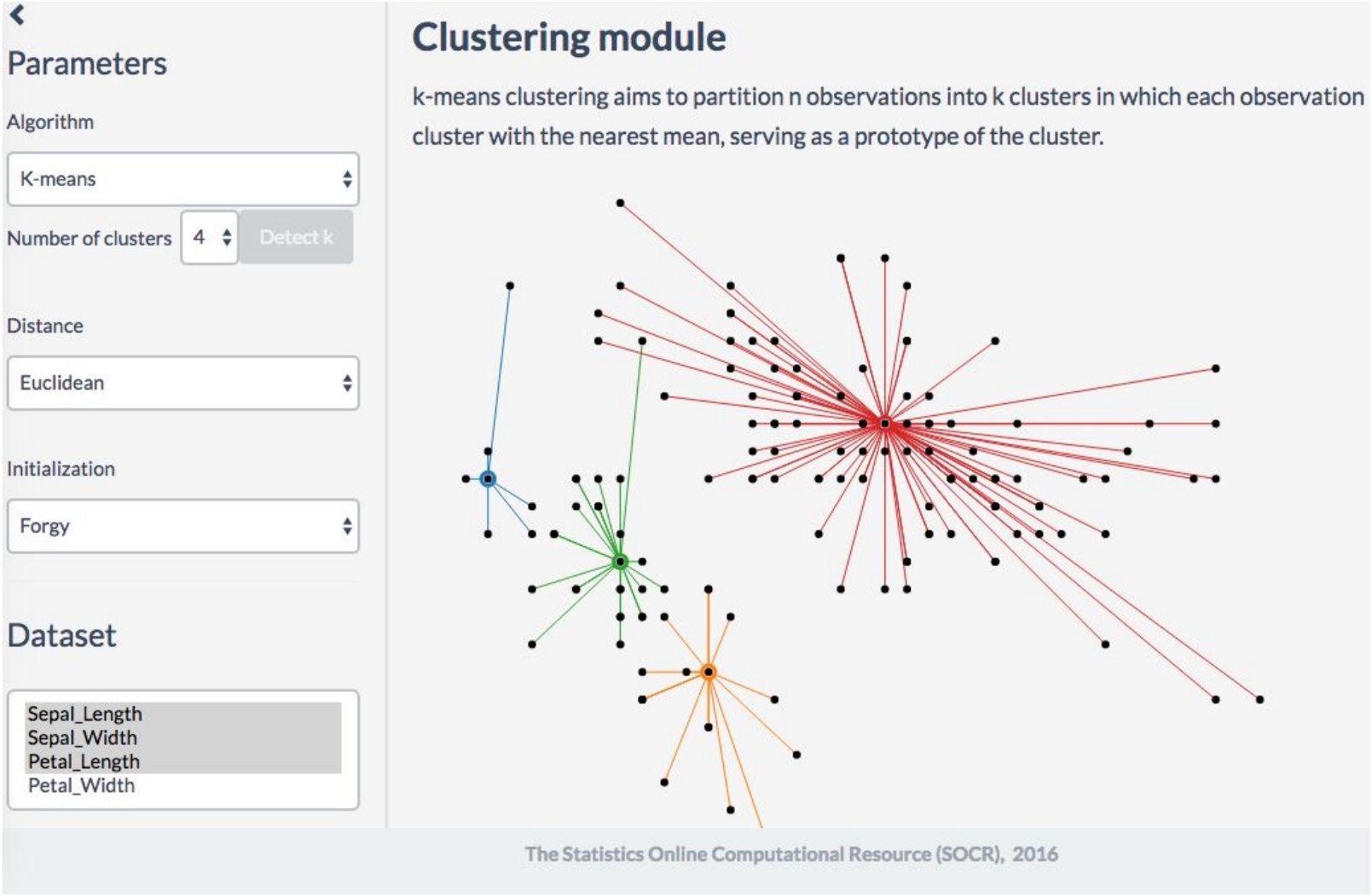
Clustering example



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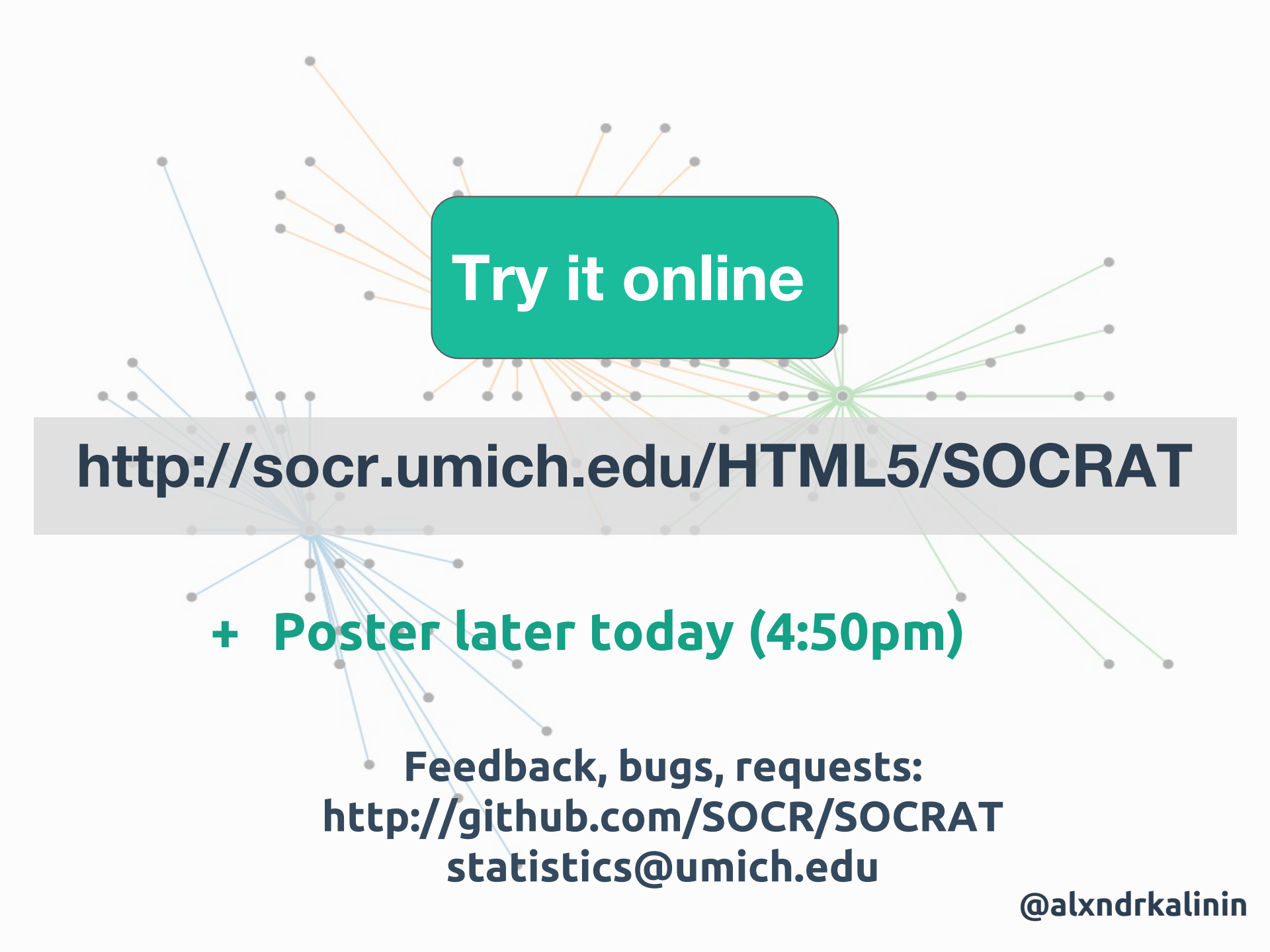
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http://github.com/SOCR/SOCRAT
statistics@umich.edu
@alxndrkalinin