Faculty involvement: Usually there would be two faculty members associated with a project: the class instructor and the project advisor. Sometimes they will be the same person.

PROJECT SUBMITTER INFORMATION

Individual/Company (name) *

Iowa State University

Submitter (name) *

Professor Eve Wurtele

Submitter (email) *

mash@iastate.edu

Project Point of Contact (name)

Eve Wurtele

Project Point of Contact (email)

mash@iastate.edu

Project Description

Project Title *

Developing novel features for interactive analysis of big data using the MetaOmGraph (MOG) software.

Describe WHAT is the project about? (1) Who are the users? (2) What are the main features? (3) What are the important use-cases? *

1) The MOG software is designed for big data analysis, and is currently used by computational biologists, cell biologists, genome biologists, and physicians/clinicians.   2) MOG is user-centered software written in Java to interactively explore and visualize large datasets. MOG can handle big datasets by efficient handling of data files. This is achieved via a combination of data indexing and buffering schemes. 3) To date, use cases include: genetics of cancer and potential gene targets for intervention; identification of biomarkers of prognosis of COVID-19; identification of novel genes of humans, yeast, and Zea maize.

What are some elements of this project? *

- [ ] Significant Specialized Domain Knowledge needed
- [x] Significant Front-end components
- [ ] Significant Back-end components
- [ ] Significant data storage and data relationship needs
- [x] Significant algorithmic approaches needed
- [ ] Significant Data analysis
- [x] Machine Learning
- [x] Other:
  Work with PhD graduate student Jeff Haltom to implement a case study on COVID-19 data.

Technology Constraints? Any specific needs for frontend/backend/database/language/ide/libraries? *

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Specialized Resources. (Please list any specialized resources to be provided by the client or NA if not applicable) *

https://github.com/urmi-21/MetaOmGraph. This is JAVA software, developed at ISU by a team of computer scientists and computational biologists.   The relevant publication is Singh et al., Nucleic Acid Research, 2021

Do you have any questions? Please list! *

some input from you, Simanta. it is better to have this as a single project, or divide it into different parts. In a quick take on this, I see: one project as creating a web-based front end; a second as implementing an algorithm for clustering large expression matrices; and a third (for someone with a bit of background in in biology/genomics (or a tremendous interest in learning this domain) as implementing a case study on COVID-19

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