Master Thesis Project

Optimization of the Unified Human Interactome Web interface

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Website:

http://www.sysbiolab.eu

Unified Human Interactome (UniHI) [1] is a database of molecular interactions developed and maintained by SysBioLab (http://www.sysbiolab.eu/). UniHI may be freely accessed though a Web page which also gives users access to computational tools for creating and analyzing molecular interaction networks.

The UniHI web page was implemented using mostly a combination of JavaServer Faces (JSF)1.2 (a Java based framework for building component based user interfaces for web pages) and JavaScript. Network visualization is handles using Cystoscape Web [2] a network visualization library based in the Cytoscape [3] network analysis application.

While UniHI as proven to be a useful tool for researcher its applications are hampered by the fact that the web interface was developed using older methods which are quickly becoming obsolete.

In this project the student will redesign and implement a new version of the UniHI website using JSF 2.2. Additionally new methodologies for handling the communication between the website will also have to be coded, most likely using object-relational mapping library like Hibernate. Besides simply updating the web site the student will also work in the development of new tools for analyzing the biological networks.

Required Skills

- Knowledge of the Java programing language.
- Familiarity with HTML.

Interest in bioinformatics and biology is desirable. However, existing knowledge in these fields is not required. For duration of the thesis work, the student will join the Systems Biology and Bioinformatics laboratory (http://www.sysbiolab.eu), whose members work on various topics in computational biology and who will provide assistance as well as a stimulating environment for the student.

References

[1] Kalathur, R. K. R., Pinto, J. P., Hernández-Prieto, M. A., Machado, R. S., Almeida, D., Chaurasia, G., & Futschik, M. E. (2014). UniHI 7: an enhanced database for retrieval and interactive analysis of human molecular interaction networks. *Nucleic acids research*, *42*(D1), D408-D414.

[2] Lopes, C. T., Franz, M., Kazi, F., Donaldson, S. L., Morris, Q., & Bader, G. D. (2010). Cytoscape Web: an interactive web-based network browser. *Bioinformatics*, *26*(18), 2347-2348.

[3] Saito, R., Smoot, M. E., Ono, K., Ruscheinski, J., Wang, P. L., Lotia, S., ... & Ideker, T. (2012). A travel guide to Cytoscape plugins. *Nature methods*, *9*(11), 1069-1076.