A pageranking based method for identifying characteristic genes of a disease

Hai D.T., Lee W., Thuy H.Q.

SYSlab., College of Technology, Vietnam National University, Hanoi 144, Xuan Thuy, Cau Giay, Ha Noi, Viet Nam; Network Research Lab. (NetLab), 507, A-San Science Building, Korea University, Seoul, South Korea

Abstract: Ranking is an importance task in the research field of complex biological networks, including gene networks [11]. In this article, we propose a method for ranking the genes causing a specific type of disease, special characteristics of samples under a particular condition. Genes with the highest scores may be considered as the key factors leading to the development of disease type in the studied samples. The experience results on the gene expression data of two subtypes of Leukemia cancer disease, i.e., ALB and ALT for B-cells and T-cells are respectively showed.

Author Keywords: Feature set; Gene networks; Rank of genes

Index Keywords: Chlorine compounds; Gene expression; B-cells; Biological networks; Feature set; Gene expression data; Gene networks; International conferences; Key factors; Particular condition; Rank of genes; T-cells; Genes

Year: 2008

Source title: Proceedings of 2008 IEEE International Conference on Networking, Sensing and Control, ICNSC

Art. No.: 4525457

Page : 1496-1499

Cited by: 1

Link: Scorpus Link

Correspondence Address: Hai, D. T.; SYSlab., College of Technology, Vietnam National University, Hanoi 144, Xuan Thuy, Cau Giay, Ha Noi, Viet Nam; email: haidt@vnu.edu.vn

Sponsors: IEEE Systems, Man and Cybernetics Society

Conference name: 2008 IEEE International Conference on Networking, Sensing and Control, ICNSC

Conference date: 6 April 2008 through 8 April 2008

Conference location: Sanya

Conference code: 72895

ISBN: 9.78E+12

DOI: 10.1109/ICNSC.2008.4525457

Language of Original Document: English

Abbreviated Source Title: Proceedings of 2008 IEEE International Conference on Networking, Sensing and Control, ICNSC

Document Type: Conference Paper

Source: Scopus

Authors with affiliations:

- Hai, D.T., SYSlab., College of Technology, Vietnam National University, Hanoi 144, Xuan Thuy, Cau Giay, Ha Noi, Viet Nam
- Lee, W., Network Research Lab. (NetLab), 507, A-San Science Building, Korea University, Seoul, South Korea
- Thuy, H.Q., SYSlab., College of Technology, Vietnam National University, Hanoi 144, Xuan Thuy, Cau Giay, Ha Noi, Viet Nam

References:

- Akutsu, T., Miyano, S., Kuhara, S., Identification of genetic networks from a small number of gene expression patterns under the Bool ean network model (1990) Proc. Pacific Symposium on Biocomputing, pp. 17-28
- Andrew D Keller, Michel Schummer, Walter L Ruzzo, Lee Hood (2000). Bayesian classification of DNA array expression data, Technical Report UW-CSE-2000-08-01, Univ WashingtonBaeza-Yates, R., Boldi, P., Castillo, C., Generalizing PageRank: Damping functions for link-based ranking algorithms (2006) Proceedings of foe 29th Annual International ACM SIGIR (ACM Press), pp. 308-315
- Bengtsson, H., (2003) Introduction to cDNA microarray analysis, , http://www.maths, Sweden, http://www.maths.lth.selbioinformaticslcalendar/20030411
- Brin, S., Page, L., The Anatomy of a Large-scale Hypertextual Web Search Engine (1998) Proceedings 7th WWW Conference, pp. 107-117
- Dang, T., Thu Trang, N., Ha, Q., Graph of Concepts Based Text Summarization (2006) The 9th National Conference on Information Technology and Communication, , Da Lat, Viet Nam, June
- Dudoit, S., Fridlyand, J., Speed, T.P., Comparison of Discrimination Methods for the Classification of Tumors Using Gene Expression Data (2002) J. Am Stat. Assoc, 97, pp. 77-87
- Golub, T.R., Slonim, D.K., Tamayo, P., Huard, C., Gaasenbeek, M., Mesirov, J.P., Coller, H., Caligiuri, M., Molecular classification of cancer: Class discovery and class prediction by gene expression monitoring (1999) Science, 286, pp. 531-537
- Kleinberg, J., Authoritative Sources in a Hyperlinked Environment (1999) Journal of the ACM, 46 (5), pp. 604-632
- Kleinberg, J., Kumar, R., Raghavan, P., Rajagopalan, S., Tomkins, A., The Web as a Graph: Measurements, Models, and Methods (1999) Proceedings 5th COCOON Conference, pp. 1-17
- Franke, L., Harm van Bakel, L.F., Edwin D. de Jong, Michael Egmont-Petersen, and Cisca Wijmenga (2006). Reconstruction of a Functional Human Gene Network, with an Application for Prioritizing Positional Candidate Genes (2006) The American Journal of Human Genetics, 78, pp. 1011-1015. , June
- Page, L., Brin, S., Motwani, R., Winograd, T., The RageRank citation ranking: Bringing order to the Web (1998), Tech. report, Stanford UniversityMihalcea, R., Graph-based Ranking Algorithms for Sentence Extraction, Applied to Text Summarization (2004) Proceedings of the 42nd Annual Meeting of the Association for Computational Linguistics, companion volume (ACL, , Barcelona, Spain, July
- Shmulevich, E.R.D., Zhang, W., From Boolean to probabilistic Boolean networks as models of genetic regulatory networks (2002) Proceedings offthe IEEE, 90 (11), pp. 1778-1792
- Sidiropoulos, A., Manolopoulos, Y., Generalized Comparison of Graph-based Ranking Algorithms for Publications and Authors (2006) Journal for Systems and Software, 79 (12), pp. 1679-1700
- Werner Dubitzky, Martin Granzow, C. Stephen Downes, Daniel B errar (1999). Pratical approach to Microarray Analysis. Oxford University PressCohen, W.W., Schapire, R.E., Singer, Y., Learming to Order Things (1999) Advances in Neural Information Processing Systems
- Guan, Z., Zhao, H., A serniparametric approach for marker gene selection based on gene expression data (2005) Bioinformatics, 214, pp. 529-536

Download: 0467.pdf