







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## Medical data mining for heart diseases and the future of sequential mining in medical field (Book Chapter)

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### Abstract

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Data Mining in general is the act of extracting interesting patterns and discovering non-trivial knowledge from a large amount of data. Medical data mining can be used to understand the events happened in the past, i.e. studying a patients vital signs to understand his complications and discover why he has died, or to predict the future by analyzing the events that had happened. In this chapter we are presenting an overview on studies that use data mining to predict heart failure and heart diseases classes. We will also focus on one of the trendiest data-mining field, namely the Sequential Mining, which is a very promising paradigm. Due to its important results in many fields, this chapter will also cover all its extensions from Sequential Pattern Mining, to Sequential Rule Mining and Sequence Prediction. Pattern Mining is the discovery of important and unexpected patterns or information and was introduced in 1990 with the well-known Apriori. Sequential Patterns Mining aims to extract and analyze frequent subsequences from sequences of events or items with time constraint. The importance of a sequence can be measured based on different factors such as the frequency of their occurrence, their length and their profit. In 1995, Agrawal et al. introduced a new Apriori algorithm supporting time constraints named AprioriAll. The algorithm studied the transactions through time, in order to extract frequent patterns from the sequences of products related to a customer. Time dimension is a very important factor in analyzing medical data, making it necessary to present a positioning of Sequential Mining in the medical domain. © 2019, Springer International Publishing AG, part of Springer Nature.

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### References (92)


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- 1 Ponikowski, P., Voors, A.A., Anker, S.D., Bueno, H., Cleland, J.G.F., Coats, A.J.S., Falk, V., (...), Davies, C.  
2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure  
(Open Access)

(2016) *European Heart Journal*, 37 (27), pp. 2129-2200m. Cited 2661 times.<http://eurheartj.oxfordjournals.org/>

doi: 10.1093/eurheartj/ehw128

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(2018) *Engineering Applications of Artificial Intelligence*

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(2017) *2017 International Conference on Computer and Applications, ICCA 2017*




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- 
- 2 Aljaaf, A.J., Al-Jumeily, D., Hussain, A.J., Dawson, T., Fergus, P., Al-Jumaily, M.  
**Predicting the likelihood of heart failure with a multi level risk assessment using decision tree**
- (2015) *2015 3rd International Conference on Technological Advances in Electrical, Electronics and Computer Engineering, TAECE 2015*, art. no. 7113608, pp. 101-106. Cited 11 times.  
ISBN: 978-147995680-7  
doi: 10.1109/TAECE.2015.7113608
- View at Publisher 
- 
- 3 Cowie, M.  
**The Heart Failure Epidemic**  
(2012) *Medicographia*. Cited 6 times.
- 
- 4 Son, C.-S., Kim, Y.-N., Kim, H.-S., Park, H.-S., Kim, M.-S.  
**Decision-making model for early diagnosis of congestive heart failure using rough set and decision tree approaches** (Open Access)
- (2012) *Journal of Biomedical Informatics*, 45 (5), pp. 999-1008. Cited 47 times.  
doi: 10.1016/j.jbi.2012.04.013
- View at Publisher 
- 
- 5 Roger, V.L.  
**The heart failure epidemic** (Open Access)
- (2010) *International Journal of Environmental Research and Public Health*, 7 (4), pp. 1807-1830. Cited 70 times.  
<http://www.mdpi.com/1660-4601/7/4/1807/pdf>  
doi: 10.3390/ijerph7041807
- View at Publisher 
- 
- 6 Hartmann, C.R.P., Varshney, P.K., Mehrotra, K.G., Gerberich, C.L.  
**Application of Information Theory to the Construction of Efficient Decision Trees**
- (1982) *IEEE Transactions on Information Theory*, 28 (4), pp. 565-577. Cited 63 times.  
doi: 10.1109/TIT.1982.1056522
- View at Publisher 
- 
- 7 Quinlan, J.R.  
(2014) *C4.5: Programs for Machine Learning*. Cited 469 times.  
Elsevier
- 
- 8 Quinlan, J.R.  
**Induction of Decision Trees** (Open Access)
- (1986) *Machine Learning*, 1 (1), pp. 81-106. Cited 9111 times.  
doi: 10.1023/A:1022643204877
- View at Publisher 
- 
- 9 Cortes, C., Vapnik, V.  
**Support-Vector Networks** (Open Access)
- (1995) *Machine Learning*, 20 (3), pp. 273-297. Cited 21088 times.  
doi: 10.1023/A:1022627411411
- View at Publisher 
- 
- 10 Murty, M.N., Devi, V.S.  
(2011) *Bayes Classifier*, pp. 86-102. Cited 4 times.  
Springer, London
-









- 
- 11 Haykin, S.  
(1998) *Neural Networks: A Comprehensive Foundation*. Cited 24155 times.  
2nd edn. Prentice Hall PTR, Upper Saddle River, NJ, USA
- 
- 12 Breiman, L., Friedman, J.H., Olshen, R.A., Stone, C.J.  
Classification and regression trees  
  
(2017) *Classification and Regression Trees*, pp. 1-358. Cited 2100 times.  
<http://www.tandfebooks.com/doi/book/10.1201/9781315139470>  
ISBN: 978-135146049-1; 978-041204841-8  
doi: 10.1201/9781315139470  
  
View at Publisher 
- 
- 13 Hall, M., Frank, E., Holmes, G., Pfahringer, B., Reutemann, P., Witten, I.H.  
The weka data mining software: An update  
(2009) *SIGKDD Explor. Newsl.*, 11 (1), pp. 10-18. Cited 11059 times.
- 
- 14 Zadeh, L.A.  
Fuzzy sets  
(1996) *Fuzzy Sets, Fuzzy Logic, and Fuzzy Systems*, pp. 394-432. Cited 76 times.  
Lotfi A.Z. (ed.), World Scientific
- 
- 15 Hartigan, J.A., Wong, M.A.  
Algorithm as 136: A K-means clustering algorithm  
(1979) *J. R. Stat. Soc. Ser. C (Appl. Stat.)*, 28 (1), pp. 100-108. Cited 5515 times.
- 
- 16 Ho, T.K.  
Random decision forests  
  
(1995) *Proceedings of the International Conference on Document Analysis and Recognition, ICDAR*, 1, art. no. 598994, pp. 278-282. Cited 1025 times.  
ISBN: 0818671289  
doi: 10.1109/ICDAR.1995.598994  
  
View at Publisher 
- 
- 17 Ho, T.K.  
The random subspace method for constructing decision forests  
  
(1998) *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 20 (8), pp. 832-844. Cited 2793 times.  
doi: 10.1109/34.709601  
  
View at Publisher 
- 
- 18 Suganya, S., Selvy, P.T.  
A proficient heart diseases prediction method using fuzzy-cart algorithm  
(2016) *Int. J. Sci. Eng. Appl. Sci.*, 2 (1).
- 
- 19 Masetic, Z., Subasi, A.  
Congestive heart failure detection using random forest classifier  
  
(2016) *Computer Methods and Programs in Biomedicine*, 130, pp. 54-64. Cited 52 times.  
[www.elsevier.com/locate/cmpb](http://www.elsevier.com/locate/cmpb)  
doi: 10.1016/j.cmpb.2016.03.020  
  
View at Publisher 
-

- 
- 20 Goldberger, A.L., Amaral, L.A., Glass, L., Hausdorff, J.M., Ivanov, P.C., Mark, R.G., Mietus, J.E., (...), Stanley, H.E.  
PhysioBank, PhysioToolkit, and PhysioNet: components of a new research resource for complex physiologic signals.  
(2000) *Circulation*, 101 (23), pp. E215-220. Cited 4886 times.  
View at Publisher 
- 
- 21 Pandey, A.K., Pandey, P., Jaiswal, K.  
A heart disease prediction model using decision tree  
(2013) *IUPJ. Comput. Sci.*, 7 (3), p. 43. Cited 2 times.
- 
- 22 UCI-Repository: Heart disease dataset  
*Center for Machine Learning and Intelligent Systems*  
<http://archive.ics.uci.edu/ml/datasets/heart+disease>
- 
- 23 Bashir, S., Qamar, U., Javed, M.Y.  
An ensemble based decision support framework for intelligent heart disease diagnosis  
(2015) *International Conference on Information Society, i-Society 2014*, art. no. 7009056, pp. 259-264. Cited 19 times.  
ISBN: 978-190832038-4  
doi: 10.1109/i-Society.2014.7009056  
View at Publisher 
- 
- 24 Chaurasia, V., Pal, S.  
Early prediction of heart diseases using data mining techniques  
(2013) *Caribb. J. Sci. Technol.*, 1, pp. 208-217. Cited 55 times.
- 
- 25 Gharehchopogh, F.S., Khalifelu, Z.A.  
Neural Network application in diagnosis of patient: A case study  
(2011) *Proceedings - International Conference on Computer Networks and Information Technology*, art. no. 6020937, pp. 245-249. Cited 10 times.  
ISBN: 978-161284941-6  
doi: 10.1109/ICCNIT.2011.6020937  
View at Publisher 
- 
- 26 Uppin, S., Anusuya, M.  
Expert system design to predict heart and diabetes diseases  
(2014) *Int. J. Sci. Eng. Technol.*, 3 (8), pp. 1054-1059. Cited 3 times.
- 
- 27 Shouman, M., Turner, T., Stocker, R.  
Integrating decision tree and k-means clustering with different initial centroid selection methods in the diagnosis of heart disease patients  
(2012) *Proceedings of the International Conference on Data Mining (DMIN), the Steering Committee of the World Congress in Computer Science, Computer Engineering and Applied Computing (Worldcomp)*, p. 1. Cited 14 times.
- 
- 28 Bohacik, J., Kambhampati, C., Davis, D., Cleland, J.  
Alternating decision tree applied to risk assessment of heart failure patients  
(2013) *J. Inf. Technol.*, 6 (2), pp. 25-33. Cited 9 times.
-








- 
- 29 Melillo, P., De Luca, N., Bracale, M., Pecchia, L.  
Classification tree for risk assessment in patients suffering from congestive heart failure via long-term heart rate variability (Open Access)  
  
(2013) *IEEE Journal of Biomedical and Health Informatics*, 17 (3), pp. 727-733. Cited 62 times.  
doi: 10.1109/JBHI.2013.2244902  
  
View at Publisher 
- 
- 30 Sathish, M., Sridhar, D.  
Prediction of heart diseases in data mining techniques  
(2015) *Int. J. Comput. Trends Technol.*, 24.
- 
- 31 Isler, Y.  
Discrimination of systolic and diastolic dysfunctions using multi-layer perceptron in heart rate variability analysis  
  
(2016) *Computers in Biology and Medicine*, 76, pp. 113-119. Cited 11 times.  
[www.elsevier.com/locate/complbiomed](http://www.elsevier.com/locate/complbiomed)  
doi: 10.1016/j.complbiomed.2016.06.029  
  
View at Publisher 
- 
- 32 Shah, S.J., Katz, D.H., Selvaraj, S., Burke, M.A., Yancy, C.W., Gheorghiane, M., Bonow, R.O., (...), Deo, R.C.  
Phenomapping for novel classification of heart failure with preserved ejection fraction  
(2014) *Circulation*, 114.
- 
- 33 Srinivas, K., Rao, G.R., Govardhan, A.  
Analysis of attribute association in heart disease using data mining techniques  
(2012) *Int. J. Eng. Res. Appl.*, pp. 1680-1683. Cited 8 times.
- 
- 34 Nahar, J., Imam, T., Tickle, K.S., Chen, Y.-P.P.  
Association rule mining to detect factors which contribute to heart disease in males and females  
  
(2013) *Expert Systems with Applications*, 40 (4), pp. 1086-1093. Cited 112 times.  
doi: 10.1016/j.eswa.2012.08.028  
  
View at Publisher 
- 
- 35 Methaila, A., Kansal, P., Arya, H., Kumar, P.  
Early heart disease prediction using data mining techniques  
(2014) *Comput. Sci. Inf. Technol. J.*, pp. 53-59. Cited 9 times.
- 
- 36 Sudhakar, K., Manimekalai, D.M.  
Study of heart disease prediction using data mining  
(2014) *Int. J. Adv. Res. Comput. Sci. Softw. Eng.*, 4 (1). Cited 28 times.
- 
- 37 Ilayaraja, M., Meyyappan, T.  
Efficient Data Mining Method to Predict the Risk of Heart Diseases Through Frequent Itemsets (Open Access)  
  
(2015) *Procedia Computer Science*, 70, pp. 586-592. Cited 13 times.  
<http://www.sciencedirect.com/science/journal/18770509>  
doi: 10.1016/j.procs.2015.10.040  
  
View at Publisher 
-









- 
- 38 Subramanian, S., Mohanapriya, S., Nagasandhiyalakshmi, B., Shanmugapriya, N.  
Prediction of outbreak heart diseases using text mining  
(2016) *Discovery*, pp. 1070-1077. Cited 2 times.
- 
- 39 Yang, G., Ren, Y., Pan, Q., Ning, G., Gong, S., Cai, G., Zhang, Z., (...), Yan, J.  
A heart failure diagnosis model based on support vector machine  
  
(2010) *Proceedings - 2010 3rd International Conference on Biomedical Engineering and Informatics, BMEI 2010*, 3, art. no. 5639619, pp. 1105-1108. Cited 17 times.  
ISBN: 978-142446496-8  
doi: 10.1109/BMEI.2010.5639619  
  
View at Publisher 
- 
- 40 Rjeily, C.B., Badr, G., Hassani, A.H.E., Andres, E.  
Sequence prediction algorithm for heart failure prediction  
  
(2017) *Proceedings of the International Conference on E-Health, EH 2017 - Part of the Multi Conference on Computer Science and Information Systems 2017*, pp. 109-116.  
<http://www.iadisportal.org/digital-library/iadis-international-conference-e-health-2017-part-of-mccsis-2017>  
ISBN: 978-989853365-4  
  

- 
- 41 Rjeily, C.B., Badr, G., Hassani, A.H.A., Andres, E.  
Predicting heart failure class using a sequence prediction algorithm  
  
(2017) *International Conference on Advances in Biomedical Engineering, ICABME, 2017-October*, art. no. 8167546.  
<https://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=8119420>  
ISBN: 978-153861642-0  
doi: 10.1109/ICABME.2017.8167546  
  
View at Publisher 
- 
- 42 Zaki, M.J.  
SPADE: An efficient algorithm for mining frequent sequences (Open Access)  
  
(2001) *Machine Learning*, 42 (1-2), pp. 31-60. Cited 1158 times.  
doi: 10.1023/A:1007652502315  
  
View at Publisher 
- 
- 43 Reys, J., Garibaldi, J.M., Aickelin, U., Soria, D., Gibson, J.E., Hubbard, R.B.  
Discovering sequential patterns in a UK general practice database  
  
(2012) *Proceedings - IEEE-EMBS International Conference on Biomedical and Health Informatics: Global Grand Challenge of Health Informatics, BHI 2012*, art. no. 6211748, pp. 960-963. Cited 6 times.  
ISBN: 978-145772177-9  
doi: 10.1109/BHI.2012.6211748  
  
View at Publisher 
- 
- 44 Batal, I., Valizadegan, H., Cooper, G.F., Hauskrecht, M.  
A pattern mining approach for classifying multivariate temporal data  
  
(2011) *Proceedings - 2011 IEEE International Conference on Bioinformatics and Biomedicine, BIBM 2011*, art. no. 6120466, pp. 358-365. Cited 36 times.  
ISBN: 978-076954574-5  
doi: 10.1109/BIBM.2011.39  
  
View at Publisher 
-

- 
- 45 Wright, A.P., Wright, A.T., McCoy, A.B., Sittig, D.F.  
**The use of sequential pattern mining to predict next prescribed medications**  
([Open Access](#))  
(2015) *Journal of Biomedical Informatics*, 53, pp. 73-80. Cited 49 times.  
<http://www.elsevier.com/inca/publications/store/6/2/2/8/5/7/index.htm>  
doi: 10.1016/j.jbi.2014.09.003  
View at Publisher 
- 
- 46 Bou Rjeily, C., Badr, G., El Hassani, A.H., Andres, E.  
(2017) *Overview on Sequential Mining Algorithms and Their Extensions*  
Springer
- 
- 47 Rjeily, C.B., Badr, G., Hassani, A.H.E., Andres, E.  
**Sequential Mining Classification**  
(2017) *2017 International Conference on Computer and Applications, ICCA 2017*, art. no. 8079747, pp. 190-194.  
ISBN: 978-153862752-5  
doi: 10.1109/COMAPP.2017.8079747  
View at Publisher 
- 
- 48 Srikant, R., Agrawal, R.  
**Mining sequential patterns: Generalizations and performance improvements**  
(1996) *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 1057 LNCS, pp. 3-17. Cited 455 times.  
ISBN: 354061057X; 978-354061057-1  

- 
- 49 Fournier-Viger, P., Lin, J.C.W., Kiran, R.U., Koh, Y.S., Thomas, R.  
A survey of sequential pattern mining  
(2017) *Data Sci. Pattern Recognit.*, 1 (1), pp. 54-77. Cited 75 times.
- 
- 50 Agrawal, Rakesh, Srikant, Ramakrishnan  
**Mining sequential patterns**  
(1995) *Proceedings - International Conference on Data Engineering*, pp. 3-14. Cited 3477 times.  
View at Publisher 
- 
- 51 Han, J., Pei, J., Kamber, M.  
(2011) *Data Mining: Concepts and Techniques*. Cited 14708 times.  
Elsevier
- 
- 52 Lin, J., Keogh, E., Wei, L., Lonardi, S.  
**Experiencing SAX: A novel symbolic representation of time series**  
(2007) *Data Mining and Knowledge Discovery*, 15 (2), pp. 107-144. Cited 667 times.  
doi: 10.1007/s10618-007-0064-z  
View at Publisher 
- 
- 53 Camera, A., Palpanas, T., Shieh, J., Keogh, E.  
**iSAX 2.0: Indexing and mining one billion time series**  
(2010) *Proceedings - IEEE International Conference on Data Mining, ICDM*, art. no. 5693959, pp. 58-67. Cited 104 times.  
ISBN: 978-076954256-0  
doi: 10.1109/ICDM.2010.124  
View at Publisher 
-

- 
- 54 Fu, T.-C.  
A review on time series data mining  
  
(2011) *Engineering Applications of Artificial Intelligence*, 24 (1), pp. 164-181. Cited 638 times.  
doi: 10.1016/j.engappai.2010.09.007  
  
View at Publisher 
- 
- 55 Zaki, M.J.  
Scalable algorithms for association mining  
  
(2000) *IEEE Transactions on Knowledge and Data Engineering*, 12 (3), pp. 372-390. Cited 870 times.  
doi: 10.1109/69.846291  
  
View at Publisher 
- 
- 56 Ayres, J., Flannick, J., Gehrke, J., Yiu, T.  
Sequential pattern mining using A bitmap representation  
  
(2002) *Proceedings of the ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, pp. 429-435. Cited 584 times.  
  
View at Publisher 
- 
- 57 Aseervatham, S., Osmani, A., Viennet, E.  
BitSPADE: A lattice-based sequential pattern mining algorithm using bitmap representation  
  
(2006) *Proceedings - IEEE International Conference on Data Mining, ICDM*, art. no. 4053104, pp. 792-797. Cited 15 times.  
ISBN: 0769527019; 978-076952701-7  
doi: 10.1109/ICDM.2006.28  
  
View at Publisher 
- 
- 58 Fournier-Viger, P., Gomariz, A., Campos, M., Thomas, R.  
Fast vertical mining of sequential patterns using co-occurrence information  
  
(2014) *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 1 8443 LNAI (PART 1), pp. 40-52. Cited 69 times.  
doi: 10.1007/978-3-319-06608-0\_4  
  
View at Publisher 
- 
- 59 Pei, J., Han, J., Mortazavi-Asl, B., Pinto, H., Chen, Q., Dayal, U., Hsu, M.-C.  
PrefixSpan: Mining sequential patterns efficiently by prefix-projected pattern growth  
  
(2001) *Proceedings - International Conference on Data Engineering*, pp. 215-224. Cited 1377 times.  
  

- 
- 60 Han, J., Pei, J., Yin, Y., Mao, R.  
Mining frequent patterns without candidate generation: A frequent-pattern tree approach  
  
(2004) *Data Mining and Knowledge Discovery*, 8 (1), pp. 53-87. Cited 1517 times.  
doi: 10.1023/B:DAMI.0000005258.31418.83  
  
View at Publisher 
- 
- 61 Mabroukeh, N.R., Ezeife, C.I.  
A taxonomy of sequential pattern mining algorithms  
  
(2010) *ACM Computing Surveys*, 43 (1), art. no. 3. Cited 169 times.  
doi: 10.1145/1824795.1824798  
  
View at Publisher 
-



- 
- 62 Yan, X., Han, J., Afshar, R.  
Clospan: Mining: Closed sequential patterns in large datasets  
(2003) *Proceedings of the 2003 SIAM International Conference on Data Mining, SIAM*, pp. 166-177. Cited 485 times.
- 
- 63 Wang, J., Han, J.  
BIDE: Efficient mining of frequent closed sequences  
(2004) *Proceedings - International Conference on Data Engineering*, 20, pp. 79-90. Cited 391 times.  

- 
- 64 Gomariz, A., Campos, M., Marin, R., Goethals, B.  
ClaSP: An efficient algorithm for mining frequent closed sequences  
(2013) *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 7818 LNAI (PART 1), pp. 50-61. Cited 59 times.  
ISBN: 978-364237452-4  
doi: 10.1007/978-3-642-37453-1\_5  
View at Publisher 
- 
- 65 Lee, Y.-S., Yen, S.-j.  
Incremental and interactive mining of web traversal patterns  
(2008) *Information Sciences*, 178 (2), pp. 287-306. Cited 39 times.  
doi: 10.1016/j.ins.2007.08.020  
View at Publisher 
- 
- 66 Fournier-Viger, P., Gomariz, A., Šebek, M., Hlosta, M.  
VGEN: Fast vertical mining of sequential generator patterns  
(2014) *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 8646 LNCS, pp. 476-488. Cited 15 times.  
<http://springerlink.com/content/0302-9743/copyright/2005/>  
ISBN: 978-331910159-0  
doi: 10.1007/978-3-319-10160-6\_42  
View at Publisher 
- 
- 67 Lo, D., Khoo, S.-C., Li, J.  
Mining and ranking generators of sequential patterns  
(2008) *Society for Industrial and Applied Mathematics - 8th SIAM International Conference on Data Mining 2008, Proceedings in Applied Mathematics 130*, 2, pp. 553-564. Cited 44 times.  
ISBN: 978-160560317-9  
View at Publisher 
- 
- 68 Pham, T.-T., Luo, J., Hong, T.-P., Vo, B.  
MSGPs: A novel algorithm for mining sequential generator patterns  
(2012) *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 7654 LNAI (PART 2), pp. 393-401. Cited 12 times.  
ISBN: 978-364234706-1  
doi: 10.1007/978-3-642-34707-8\_40  
View at Publisher 
- 
- 69 Barron, A., Rissanen, J., Yu, B.  
The Minimum Description Length Principle in Coding and Modeling  
(1998) *IEEE Transactions on Information Theory*, 44 (6), pp. 2743-2760. Cited 585 times.  
doi: 10.1109/18.720554  
View at Publisher 
-

- 
- 70 Fournier-Viger, P., Gomariz, A., Gueniche, T., Soltani, A., Wu, C.-W., Tseng, V.S.  
SPMF: A java open-source pattern mining library  
(2014) *Journal of Machine Learning Research*, 15, art. no. A28, pp. 3389-3393. Cited 175 times.  
<http://jmlr.csail.mit.edu/papers/volume15/fournierviger14a/fournierviger14a.pdf>  
View at Publisher 
- 
- 71 Gao, C., Wang, J., He, Y., Zhou, L.  
Efficient mining of frequent sequence generators  
(2008) *Proceeding of the 17th International Conference on World Wide Web 2008, WWW'08*, pp. 1051-1052. Cited 37 times.  
ISBN: 978-160558085-2  
doi: 10.1145/1367497.1367651  
View at Publisher 
- 
- 72 Yi, S., Zhao, T., Zhang, Y., Ma, S., Che, Z.  
An effective algorithm for mining sequential generators (Open Access)  
(2011) *Procedia Engineering*, 15, pp. 3653-3657. Cited 13 times.  
doi: 10.1016/j.proeng.2011.08.684  
View at Publisher 
- 
- 73 Fournier-Viger, P., Wu, C.-W., Tseng, V.S.  
Mining maximal sequential patterns without candidate maintenance  
(2013) *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 8346 LNAI (PART 1), pp. 169-180. Cited 22 times.  
ISBN: 978-364253913-8  
doi: 10.1007/978-3-642-53914-5\_15  
View at Publisher 
- 
- 74 Fournier-Viger, P., Wu, C.-W., Gomariz, A., Tseng, V.S.  
VMSP: Efficient vertical mining of maximal sequential patterns  
(2014) *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 8436 LNAI, pp. 83-94. Cited 27 times.  
ISBN: 978-331906482-6  
doi: 10.1007/978-3-319-06483-3\_8  
View at Publisher 
- 
- 75 Lam, H.T., Mörchen, F., Fradkin, D., Calders, T.  
Mining Compressing Sequential Patterns  
(2014) *Statistical Analysis and Data Mining*, 7 (1), pp. 34-52. Cited 45 times.  
doi: 10.1002/sam.11192  
View at Publisher 
- 
- 76 Tzvetkov, P., Yan, X., Han, J.  
TSP: Mining top-k closed sequential patterns  
(2005) *Knowledge and Information Systems*, 7 (4), pp. 438-457. Cited 57 times.  
doi: 10.1007/s10115-004-0175-4  
View at Publisher 
- 
- 77 Fournier-Viger, P., Zida, S., Lin, J.C.-W., Wu, C.-W., Tseng, V.S.  
EFIM-closed: Fast and memory efficient discovery of closed high-utility itemsets  
(2016) *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 9729, pp. 199-213. Cited 12 times.  
<http://springerlink.com/content/0302-9743/copyright/2005/>  
ISBN: 978-331941919-0  
doi: 10.1007/978-3-319-41920-6\_15  
View at Publisher 
-

- 78 Shie, B.-E., Hsiao, H.-F., Tseng, V.S., Yu, P.S.

### Mining high utility mobile sequential patterns in mobile commerce environments

(2011) *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 6587 LNCS (PART 1), pp. 224-238. Cited 43 times.

ISBN: 978-364220148-6

doi: 10.1007/978-3-642-20149-3\_18

View at Publisher



- 79 Ahmed, Q.F., Tanbeer, S.K., Jeong, B.-S.

### Mining high utility web access sequences in dynamic web log data

(2010) *Proceedings - 11th ACIS International Conference on Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing, SNPD2010*, art. no. 5521504, pp. 76-81. Cited 25 times.

ISBN: 978-076954088-7

doi: 10.1109/SNPD.2010.21

View at Publisher



- 80 Ahmed, C.F., Tanbeer, S.K., Jeong, B.-S.

### A novel approach for mining high-utility sequential patterns in sequence databases

(Open Access)

(2010) *ETRI Journal*, 32 (5), pp. 676-686. Cited 44 times.

<http://etrij.etri.re.kr/Cyber/Download/PublishedPaper/3205/etrij.oct2010.0676.pdf>

doi: 10.4218/etrij.10.1510.0066

View at Publisher



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