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DAFTAR PUSTAKA

Abarna, S., dan Amudha, V., 2015, Performance Analysis of SVM Based Arrythmia Classification, *Middle-East Journal of Scientific Research 23 (Sensing, Signal Processing and Security)*, India.

Abidin, B., Dom, R.M., Arahman, A., dan Abakar, R., 2009, Use of Fuzzy Neural Network to Predict Coronary Heart Disease in a Malaysian Sample, *Proceedings of the 8th WSEAS International Conference on Telecommunications and Informatics*, 76-80.

Acampora, G., Lee, C.S., Vitiello, A., dan Wang, M.H., 2011, Evaluating Cardiac Health Through Semantic Soft Computing Techniques, *Soft Comput*, 16, Springer, 1165–1181.

Acharya, R., Suri, J.S., dan Spaan, J.A.E., 2007, "Advances in Cardiac Signal Processing", *SPRINGER Verlag*.

Acir, N., 2005, Classification of ECG Beats By Using a Fast Least Square Support Vector Machines With a Dynamic Programming Feature Selection Algorithm, *Neural Comput & Applic 14*, p. 299–309, DOI 10.1007/s00521-005-0466-z.

Adams, E.R. dan Choi, A., 2012, Using Neural Networks to Predict Cardiac Arrhythmias, *IEEE International Conference on Systems, Man, and Cybermetics*, October 14-17, COEX, Seoul, Korea.

Adil, R., 2009, Perancangan Sistem Monitoring Online Pada Penderita Pasien Jantung Koroner Berbasis Identifikasi Sinyal Elevasi ST, *Telkomnika*, Vol.7, No.3, Desember 2009, (ISSN:1693-6930), 181-186.

Afonso, V.X., Tompkins, W.J., Nguyent, T.Q., dan Luo, S., 1996, Multirate Processing of the ECG using Filter Banks, *Computers in Cardiology*, IEEE: 0216-6541196, 245-248.

Afonso, V.X., Tompkins, W.J., Nguyent, T.Q., dan Luo, S., 1999, ECG Beat Detection Using Filter Banks, *IEEE Transactions On Biomedical Engineering*, Vol. 46, No. 2, February, 192-202.

Aksoy, S., 2012, *Homepage: Pattern Recognition*, Department of Computer Engineering, Bilkent University, Ankara, Turkey.

Ahmad, U., 2005, *Pengolahan Citra Digital dan Teknik Pemrogramannya*, Yogyakarta: Graha Ilmu.

Ahlstrom, M.L., dan Tompkins, W.J., 1983, "Automated high-speed analysis of Holter tapes with microcomputers", *IEEE Trans. Biomed. Eng.*, BME-30: 651–57.

Alfredo, S.R.R., Paraiso, E.C., dan Kaestner, C.A.A., 2009, Automatic Detection of Arrhythmias Using Wavelets and Self-Organized Artificial Neural

UNIVERSITAS GADJAH MADA
MODEL IDENTIFIKASI KELAINAN JANTUNG MENGGUNAKAN JARINGAN SYARAF TIRUAN BERDASARKAN CITRA EKG 12 SANDAPAN (Studi Kasus Kelainan Jantung Iskemia dan Aritmia)
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Networks, *Ninth International Conference on Intelligent Systems Design and Applications*, IEEE Computer Society, 648 – 653.

Ali, S.A., dan Al-Mejrad, 2011, Bio-Potential Signal Extraction from MultiChannel Paper Recorded Charts, *American Journal of Applied Sciences*, pp.520-524.

Alizadehsani, R., Habibi, J., Hosseini, M.J., Mashayekhi, H., Boghrati, R., Ghandeharioun, A., Bahadorian, B., dan Sani, J.A., 2013, A Data Mining Approach For Diagnosis of Coronary Artery Disease, *Computer Methods and Program in Biomedicine 111*, 52-61.

Amal, A., dan Reshmi, G., 2013, Cardiac Ischemia Diagnosis Using Stress ECG Analysis, *Third International Conference on Advances in Computing and Communications*, IEEE Computer Society, 204-207.

Amalorpavam, G., Harish, N.T., Kumari, J., dan Suresha, M., 2013, Analysis Of Digital Images Using Morphological Operations, *International Journal of Computer Science & Information Technology (IJCSIT)*, Vol.5, No.1, February.

Amin, S.U., Agarwal, K., dan Beg, R., 2013, Data Mining in Clinical Decision Support Systems for Diagnosis, Prediction and Treatment of Heart Disease, *International Journal of Advanced Research in Computer Engineering & Technology (IJARCET)*, Volume 2, Issue 1, January, 218-223.

Anonim, 2011, Fungsi dan Cara Kerja Jantung, *http://ajimedia.com/186/fungsi-dan-cara-kerja-jantung-manusia*, diakses 2 Januari 2014.

Anonim, 2012, Electrocardiogram (ECG), *http://reksamedja.blogspot.com/2012/10/electrocardiogram-ecg.html*, diakses 20 Juni 2014.

Anonim, 2013, Diagnosis Serangan Jantung, *http://www.news-medical.net/health/Heart-Attack-Diagnosis-28Indonesian%29.aspx*, akses: 13 Desember 2013.

Anonim, 2014, Fenomena Bioelektrik Electrocardiogram, *http://www.forumsains.com/artikel/94/?print*, diakses: 20 Desember 2013.

Anonim, 2014, Serangan Jantung Mendadak, *http://seranganjantung.org/serangan-jantung-mendadak/*, diakses 20 Juni 2014.

Arbateni, K., dan Bennia, A., 2014, Sigmoidal Radial Basis Function ANN for QRS Complex Detection, *Neurocomputing*, Elsevier.

Arsana, I.W.T., 2013, Penyakit Jantung Iskemik, *http://www.penyakitjantung.net/penyakit-jantung-iskemik/*, diakses 20 Juni 2014.

Atienza, F.A., Morgado, E., Martinez, L.F., Alberola, A.G, dan Alvarez, J.L.R., 2014, Detection of Life-Threatening Arrhythmias Using Feature Selection

UNIVERSITAS
GADJAH MADA
MODEL IDENTIFIKASI KELAINAN JANTUNG MENGGUNAKAN JARINGAN SYARAF TIRUAN BERDASARKAN CITRA EKG 12 SANDAPAN (Studi Kasus Kelainan Jantung Iskemia dan Aritmia)
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and Support Vector Machines, *IEEE Tranctions On Biomedical Engineering*, Vol. 61, No. 3, March, 832-840.

Azhar, A.N., dan Suyanto, 2009, Studi Identifikasi Sinyal ECG Irama Myocardial Ischemia Dengan Pendekatan Fuzzy Logic, *JUTI*, Vol.7, No.4, Juni, 139-206.

Bahri, S., 2012, Metode Pengolahan dan Deteksi Kompleks QRS Sinyal ECG, *Tesis*, Jurusan Teknik Elektro, Fakultas Teknik, Universitas Muhammadiyah Jakarta.

Balasundaram, K., Masse, S., Nair, K., dan Umapathy, K., 2013, Automated Signal Pattern Detection in ECG During Human Ventricular Arrhythmias, *35th Annual International Conference of the IEEE EMBS*, Osaka, Japan, 3 - 7 July, 1029-1032.

Balda, R.A., Diller, G., Deardorff, E., Doue, J., dan Hsieh, P., 1977, "The HP ECG Analysis Program", *Trends in Computer-Processed Electrocardiograms.* J. H. Van Bemnel and J. L. Willems, (eds.) Amsterdam, The Netherlands: North Holland, pp. 197–205.

Berbari, E.J., 2000, *Principles of Electrocardiography-The Biomedical Engineering Handbook*, 2nd Ed. Bronzino, J. D. Boca Raton: CRC Press LLC.

Bramer, M., 2007, *Principles of Data Mining*, Springer-Verlag London.

Busono, P., Susanto, E., Wiewie, dan Sadeli, Y., 2004, Algorithma Untuk Deteksi QRS Sinyal EKG, *Prosiding Semiloka Teknologi Simulasi dan Komputasi serta Aplikasi*, pp.101-106.

Cabello, D., Barro S., Ruiz R., Zapata E.L., dan Mira, J., 1988, Fuzzy Clustering: Application To The Diagnosis Of Ventricular Arrythmias, *IEEE Engineering In Medicine & Biology Society 10th Annual International Conference*, CH2566-8/00/0000—0005.

Cahyani, I.D., 2012, Sentimen Analisis Bahasa Indonesia Menggunakan JST Backpropagation, *Skripsi*, Universitas Telkom Bandung.

Ceylan, M., dan Özbay, Y., 2007, Comparison of FCM, PCA and WT Techniques For Classification ECG Arrhythmias Using Artificial Neural Network, *Expert Systems with Applications 33*, 286–295.

Chazal, P., O'Dwyer, M., dan Reilly,R.B., 2004, Automatic Classification of Heartbeats Using ECG Morphology and Heartbeat Interval Features, *IEEE Transactions On Biomedical Engineering*, Vol. 51, No. 7, July, 1196-1206.

Chebil, J., Al-Nabulsi, J., dan Al-Maitah, M., 2008, A Novel Method for Digitizing Standard ECG Papers, *Proceedings of the International Conference on Computer and Communication Engineering*, May, Kuala Lampur, Malaysia.

Cheruku, R., Edla, D.R., dan Kuppili, V., 2017, Diabetes Classification using Radial Basis Function Network by Combining Cluster Validity Index and

UNIVERSITAS GADJAH MADA
MODEL IDENTIFIKASI KELAINAN JANTUNG MENGGUNAKAN JARINGAN SYARAF TIRUAN BERDASARKAN CITRA EKG 12 SANDAPAN (Studi Kasus Kelainan Jantung Iskemia dan Aritmia)
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BAT Optimization with Novel Fitness Function, *International Journal of Computational Intelligence Systems*, Vol. 10, pp.247–265.

Choy, M.M., dan Jin, J.S., 1996, *Morphological image analysis of leftventricular endocardial borders in 2D echocardiograms*, School of Computer Science and Engineering University of New Sauth Wales Sydney Australia.

Christov, I., Gomez-Herrero, G., Krasteva, V., Jekova, I., Gotchev, A., dan Egiazarian, K., 2006, Comparative Study of Morphological and Time-Frequency ECG Descriptors For Heartbeat Classification, *Medical Engineering & Physics 28*, 876–887.

Damayanti, A., 2012, Pendeteksian Arrhythmia Hasil ECG Menggunakan Radial Basis Function Dan Kohonen Self Organizing Maps, *Jurnal Matematika dan Ilmu Pengetahuan Alam*, Vol. 15 No. 2, Juli, 88-91.

Damodaran, V., Jayaraman, S., dan Poonguzhali, S., 2011, A Novel Method to Extract ECG Morphology From Scanned ECG Records, *http://ieeexplore.ieee.org.ezproxy.ugm.ac.id/ielx5/6018838/6026799/06026803.pdf?tp=&arnumber=6026803&isnumber=6026799*, diakses 24 Agustus 2014.

Daskalov, I.K., Dotsinsky, I.A., dan Christov, I.I., 1998, Developments in ECG Acquisition, Preprocessing, Parameter Measurement, and Recording, *IEEE Engineering in Medicine and Biology*, 0739-5175/98.

Delannay, N., Rossi, F., Conan-Guez, B., dan Verleysen, M., 2004, Functional Radial Basis Function Networks (FRBFN), *Proceeding European Symposium on Artificial Neural Networks (ESANN)*, April 28-30, pp.313-318, Bruges, Belgium.

Dharma, M.P.W, 2013, *Klasifikasi Emosi Musik Menggunakan Algoritma Radial Basis Function Network (RBFN) dan K-Means Clustering*, Ilmu Komputer, MIPA, Universitas Udayana, Denpasar.

Depkes RI, 2007, *Pedoman Pengendalian Penyakit Jantung dan Pembuluh Darah*, Direktorat Pengendalian Penyakit Tidak Menular, Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan.

Dilmac, S., dan Korurek, M., A New ECG Arrhytmia Clustering Method Based on Modified Artificial Bee Colony Algorithm, Comparison with GA and PSO Classifiers, *IEEE*, 978-1-4799-0661-1.

Dubey, V., dan Richariya, V., 2013, A Neural Network Approach for ECG Classification, *International Journal of Emerging Technology and Advanced Engineering* (ISSN 2250-2459, ISO 9001:2008 Certified Journal, Volume 3, Issue 10, October), 189-196.

UNIVERSITAS GADJAH MADA
MODEL IDENTIFIKASI KELAINAN JANTUNG MENGGUNAKAN JARINGAN SYARAF TIRUAN BERDASARKAN CITRA EKG 12 SANDAPAN (Studi Kasus Kelainan Jantung Iskemia dan Aritmia)
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Duda, R.O., Hart, P.E., dan Stork, D.G., 2000, *Pattern Classification*, Second Edition, John Wiley & Sons.

Emam, A., Tonekabonipour, H., dan Tehnelab, M., 2011, Applying MLP as a Predictor and ANFIS as a classifier in Ischemia detection via ECG, *IEEE*, 2958-2962.

El-Khafif, S.H., dan El-Brawany, M.A., 2013, Artificial Neural Network-Based Automated ECG Signal Classifier, Hindawi Publishing Corporation, *ISRN Biomedical Engineering*, Article ID 261917, 1-7.

Engin, M., 2004, ECG Beat Classification Using Neuro-Fuzzy Network, *Pattern Recognition Letters 25*, 1715–1722.

Eom, J.H., Kim, S.H., dan Zhang, B.T., 2008, AptaCDSS-E: A Classifier Ensemble-Based Clinical Decision Support System For Cardiovascular Disease Level Prediction, *Expert Systems with Applications 34*, 2465–2479.

Fahrurozi, I., 2012, Deteksi Ketidaknormalan Premature Ventricle Contractions (PVCS) Berdasarkan RR Interval dan Correlation Coefficient, Teknik Elektro, Politeknik Negeri Batam, *KNSI*, Nopember.

Fan, C.H., Hsu, Y.H., Yu, S.N., dan Lin, J.W., 2013, Detection of Myocardial Ischemia Episode Using Morphological Features, *35th Annual International Conference of the IEEE EMBS*, Osaka, Japan, 3 - 7 July, 7334-7337.

Farahabadi, E., Farahabadi, A., Rabbani, H., Dehnavi, A.M., dan Mahjoob, M.P., 2010, An Entropy-Based Method for Ischemia Diagnosis Using ECG Signal in Wavelet Domain, *ICSP Proceedings*, 195-198.

Fausett, L., 1994, *Fundamentals of Neural Network (Architectures, Algorithms, and Application)*, New Jersey: Prentice-Hall.

Fauziyah, M., Sriwidodo T., dan Litasari, 2009, Pengembangan Jaringan Syaraf Tiruan Backpropagation Untuk Klasifikasi Isyarat EKG, *Prosiding SENTIA*, Politeknik Negeri Malang.

Fayn, J., 2011, A Classification Tree Approach for Cardiac Ischemia Detection Using Spatiotemporal Information From Three Standard ECG Leads, *IEEE Transaction On Biomedical Engineering*, Vol. 58, No. 1, January, 95-102.

Febrianty, D., Dewanto, R.A., dan Aradea, 2007, Analisis Jaringan Syaraf Tiruan PROP Untuk Mengenali Pola Elektrokardiografi Dalam Mendeteksi Penyakit Jantung Koroner, *Seminar Nasional Aplikasi Teknologi Informasi (SNATI)*, 16 Juni, Yogyakarta.

Foo, SY., Stuart, G., Harvey, B., dan Meyer-Baese, A., 2002, Neural Network-Based EKG Pattern Recognition, *Engineering Applications of Artificial Intelligence*, 15, 253–260.

Friesen, G.M., Jannett, T.C., Jadallah, M.A., Yates, S.L., Quint, S.R., dan Nagle, H.T., 1990, "A Comparison Of The Noise Sensitivity Of Nine QRS Detection Algorithms", *IEEE Trans. Biomed. Eng.*, BME-37: 85–97.

UNIVERSITAS GADJAH MADA
MODEL IDENTIFIKASI KELAINAN JANTUNG MENGGUNAKAN JARINGAN SYARAF TIRUAN BERDASARKAN CITRA EKG 12 SANDAPAN (Studi Kasus Kelainan Jantung Iskemia dan Aritmia)
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Fu, L., 1994, *Neural Network in Computer Science*, Singapura: McGraw Hill.

Gharaviri, A., Teshnehlab, M., dan Moghaddam, H.A., 2008, Ischemia Detection via ECG Using ANFIS, *30th Annual International IEEE EMBS Conference*, Vancouver, British Columbia, Canada, August 20-24, 1163-1166.

Gazali, K.H., Khleaf, H.K., dan Abdalla, A.N., 2012, A Novel ECG Heart Disease Classifier based on Hybrid Radial Basis Neural Networks, *2nd International Conference on Emerging Trends in Computer and Image Processing (ICETCIP'2012)*, June 30-July 1, 2012 Bali, 152-155.

Gerven, M.A.J., Jurgelenaite, R., Taal, B.G., Heskes, T., dan Lucas, P.J.F., 2007, Predicting Carcinoid Heart Disease With The Noisy-Threshold Classifier, *Artificial Intelligence in Medicine 40*, 45—55.

Ghongade, R., dan Ghatol, A., 2008, An Effective Feature Set for ECG Pattern Classification, *Proceedings First International Conference*, ICMB, Hong Kong, China, January 4-5, 2008, 25-32.

Goette, J., 2016, Event Detection: QRS-Complexes in ECG Signals, Bern University of Applied Science, Biel / Bienne, Institute of Human Centered Engineering – Microlab.

Goldschlager, N., dan Goldman, M.J., 1989, *Principles of Clinical Electrocardiography*, 3rd Edition, 238-25.

Golpayegani, G.N., dan Jafari, A.H., 2009, A Novel Approach In ECG Beat Recognition Using Adaptive Neural Fuzzy Filter, *Journal Biomedical Science and Engineering*, 2, 80-85.

Gonzales, R.C., dan Wood, R.E., 2002, *Digital Image Processing*, Second Edition, Pearson Prentice Hall.

Gradhianta, T., dan Fuad, Y., 2013, Penerapan Jaringan Saraf Tiruan dengan Radial Basis Function untuk Pengenalan Genre Musik, *Jurnal Online Program Studi S-1 Matematika - Fakultas MIPA UNESA (MATHunesa)*, Vol. 2, No. 2, Surabaya.

Guangying, Y., dan Yue, C., 2010, The Study of Electrocardiograph Based on Radial Basis Function Neural Network, *Third International Symposium on Intelligent Information Technology and Security Informatics*, School of Physical & Electronics Engineering Taizhou University Taizhou, China.

Gupta, G., 2010, PC Based ECG Monitoring System, *International Conference on Advances in Recent Technologies in Communication and Computing*, IEEE Computer Society,348-350.

Haar, C., Maan, A.C., Schalij, M.J., dan Swenne, C.A., 2013, Improved Electrocardiographic Detection of Hyperacute Ischemia by Difference Vector Analysis, *Computing in Cardiology*, 40, 9-12.

Han, J., dan Kamber, M., 2006, *Data mining Concept and Techniques*, San Fransisco: Morgan Kaufman Publisher.

UNIVERSITAS GADJAH MADA
MODEL IDENTIFIKASI KELAINAN JANTUNG MENGGUNAKAN JARINGAN SYARAF TIRUAN BERDASARKAN CITRA EKG 12 SANDAPAN (Studi Kasus Kelainan Jantung Iskemia dan Aritmia)
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Hardani, D.N.K., 2014, Analisis Kondisi Emosi Melalui Isyarat Elektrokardiogram, *Tesis*, Program Pascasarjana, Fakultas Teknik, UGM Yogyakarta.

Haryono, M.E.A., 2005, Pengenalan Huruf Menggunakan Model Jaringan Saraf Tiruan Radial Basis Function dengan Randomize Cluster Decision, *Seminar Nasional Aplikasi Teknologi Informasi (SNATI 2005)*, ISBN: 979-756-061-6, Yogyakarta.

Haseena, H.H., Joseph, P.K., dan Mathew, A.T., 2011, Classification of Arrhythmia Using Hybrid Networks, *J Med Syst 35*, DOI 10.1007/s10916-010-9439-6, 1617–1630.

Haykin, S., 1999, *Neural Networks (A Comprehensive Foundation)*, Second Edition, New York: Macmillan College Publishing Company.

He, L., Hou, W., Zhen, X., dan Peng, C., 2006, Recognition of ECG Patterns Using Artificial Neural Network, *Proceedings of the Sixth International Conference on Intelligent Systems Design and Applications (ISDA'06)*, 1-5.

Hendriawan, A.MS., 2013, Implementasi Metode Pengujian Sistem Pendeteksi Kelainan Ritme Jantung Berbasis Mikrokontroler 8-Bit, *Tesis*, Program Pascasarjana Fakultas Teknik, Universitas Gadjah Mada Yogyakarta.

Hughes, N.P., Tarassenko, L., dan Roberts, S.J., 2013, Markov Models for Automated ECG Interval Analysis, *http://www.robots.ox.ac.uk/~parg/pubs/nph_nips03.pdf*, diakses 25 Agustus 2014.

Indrabayu, Zaman, B., Ilham, A.A., Areni, I.S., 2015, Prediction of Reagents Needs Using Radial Basis Function in Teaching Hospital, *International Journal of Engineering and Technology (IJET)*, ISSN : 0975-4024, Vol.7, No.4, Aug-Sep.

Jabbar, M.A., Chandra, P., dan Deekshatulu, B.L., 2012, Prediction of Risk Score for Heart Disease using Associative Classification and Hybrid Feature Subset Selection, *12th International Conference on Intelligent Systems Design and Applications (ISDA)*, 628-634.

Jadhav, S., Nalbalwar, S., dan Ghatol, A., 2013, Feature Elimination Based Random Subspace Ensembles Learning For ECG Arrhythmia Diagnosis**,** *Springer-Verlag Berlin Heidelberg*, Soft Comput, DOI 10.1007/s00500-013-1079-6, 1-9.

Jadhav, S., Nalbalwar, S., dan Ghatol, A., 2012, Artificial Neural Network Models Based Cardiac Arrhythmia Disease Diagnosis From ECG Signal Data, *International Journal of Computer Applications* (0975 – 8887), Volume 44– No15, April 2012, 8-13.

Jadhav, S., Nalbalwar, S., dan Ghatol, A., 2010, ECG Arrhytmia Classification Using Modular Neural Network Model, *IEEE EMBS Conference on*

UNIVERSITAS GADJAH MADA
MODEL IDENTIFIKASI KELAINAN JANTUNG MENGGUNAKAN JARINGAN SYARAF TIRUAN BERDASARKAN CITRA EKG 12 SANDAPAN (Studi Kasus Kelainan Jantung Iskemia dan Aritmia)
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Biomedical Engineering & Science (IECBES), Kuala Lumpur, Malaysia, 30 November-2 December, 62-66.

Jadhav, S., Nalbalwar, S., dan Ghatol, A., 2010, Artificial Neural Network Based Cardiac Arrhythmia Classification Using ECG Signal Data, *International Conference on Electronics and Information Engineering (ICEIE)*, 228 – 231.

Jagtap, S.K., dan Uplane M.D., 2012, The Impact of Digital Filtering to ECG Analysis: Butterworth Filter Application, *International Conference on Communication, Information & Computing Technology (ICCICT)*, Oct. 19-20, Mumbai, India, 1–6.

Jatmiko, W., Mursanto, P., Hardian, B., Bowolaksono, A., Wiweko, B., Akbar, M.A., Satwika, I.P., Immadudin, Z., Alvissalim, M.S., Habibie, I., Ma'sum, M.A., dan Kurniawan, M.N., 2013, *Teknik Biomedis: Teori dan Implementasi*, Fakultas Ilmu Komputer, Universitas Indonesia.

Jekova, I., Bortolan, G., dan Christov, I., 2008, Assessment and Comparison of Different Methods For Heartbeat Classification, *Medical Engineering & Physics 30*, 248–257.

Jiang, X., Zhang, L., Zhao, Q., dan Albayrak, S., 2006, ECG Arrhythmias Recognition System Based on Independent Component Analysis Feature Extraction, *IEEE*, 1-4244-0549-1.

Jiang, M., Jiafu Lv, Jiang, S., Huang, W., dan Cao, L., 2012, The Combination of Self-Organizing Feature Maps and Support Vector Regression for Solving the Inverse ECG Problem, *8th International Conference on Natural Computation (ICNC)*, 475-479.

Kabo, P., 2008, *Mengungkap Pengobatan Penyakit Jantung*, Jakarta : PT Gramedia Pustaka Utama.

Kallas, M., Francis, C., Kanaan, L., Merheb, D., Honeine, P., dan Amoud, H., 2012, Multi-Class SVM Classification Combined with Kernel PCA Feature Extraction of ECG Signals, *19th International Conference on Telecommunication (ICT)*, 978-1-4673-0747-5/12.

Karim, S.K., 1996, *EKG*. Penerbit FKUI, Jakarta

Karim, S., dan Kabo, P., 1996, *EKG dan Penanggulangan Beberapa Penyakit Jantung Untuk Dokter Umum*, Jakarta: Fakultas Kedokteran UI.

Khampila, A., dan Boonjing, V., 2011, Heart disease Classification using Neural Network and Feature Selection, *21st International Conference on Systems Engineering*, IEEE Computer Society, 406-409.

Khairnar, D.G., Merchant, S.N., dan Desai, U.B., 2007, Radial basis function neural network for pulse radar detection, *Institution of Engineering and Technology Radar Sonar Navigation*, doi:10.1049/iet-rsn:20050023.

UNIVERSITAS
GADJAH MADA
MODEL IDENTIFIKASI KELAINAN JANTUNG MENGGUNAKAN JARINGAN SYARAF TIRUAN BERDASARKAN CITRA EKG 12 SANDAPAN (Studi Kasus Kelainan Jantung Iskemia dan Aritmia)
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Kher, R., Vala, D., Pawar, T., dan Thakar, 2010, *Implementation of Derivative Based QRS Complex Detection Methods*, DOI:10.1109 / BMEI.2010.5640033.

Kim, J., Shin, H.S., Shin, K., dan Lee, M., 2009, Robust Algorithm for Arrhythmia Classification in ECG Using Extreme Learning Machine, *BioMedical Engineering OnLine*, 28th.

Kohli, N., Verma, N.K., dan Roy, A., 2010, SVM Based Methods For Arrhythmia Classification in ECG, *International Conference on Computer & Communication Technology (ICCCT)*, 486-490.

Kumar, V., Sharma, J., Shahanaz, A., dan Saini, J.P., 2012, Extracting Samples As Text From ECG Strips For ECG Analysis Purpose, *Fourth International Conference on Computational Intelligence and Communication Networks*, IEEE.

Kusban, M., 2012, Restorasi Citra dalam Rekayasa Biomedik, *Annual Engineering Seminar*, Fakultas Teknik, UGM Yogyakarta.

Kusumadewi, S., 2004, *Membangun Jaringan Syaraf Tiruan Menggunakan MATLAB dan Excel Link*, Edisi Pertama, Cetakan Pertama, Graha Ilmu, Yogyakarta.

Lashgari, E., Jahed, M., dan Khalaj, B., 2013, Manifold Learning for ECG Arrhythmia Recognition, *Proceedings of 20th Iranian Conference on Biomedical Engineering (ICBME)*, University of Tehran, Iran, December 18-20, 126-131.

Lawson, WT., Wagner, GS., Startt-Selvester, RS., dan Ybarra, GA., New method for Digitization and Computerized Analysis of Paper Recordings of Standard 12-Lead Electrocardiograms, *Computers in Cardiology*, IEEE, pp. 41-44, 1995.

Lee, D.H., Park, J.W., Choi, J., Rabbi, A., dan Fazel-Rezai, R., 2013, Automatic Detection of Electrocardiogram ST Segment: Application in Ischemic Disease Diagnosis, *International Journal of Advanced Computer Science and Applications (IJACSA)*, Vol.4, No. 2, 150-155.

Lee, H.G., Kim, W.S., Noh, K.Y., Shin, J.H., Yun, U., dan Ryu, K.H., 2009, Coronary Artery Disease Prediction Method Using Linear and Non-linear Feature of Heart Rate Variability in Three Recumbent Postures, *Inf Syst Front 11*, p. 419–431, DOI 10.1007/s10796-009-9155-2.

Lee, H.G., Noh, K.Y., dan Ryu, K.H., 2008, A Data Mining Approach for Coronary Heart Disease Prediction using HRV Features and Carotid Arterial Wall Thickness, *International Conference on BioMedical Engineering and Informatics*, DOI 10.1109/BMEI.2008.189, 200-206,

UNIVERSITAS GADJAH MADA
MODEL IDENTIFIKASI KELAINAN JANTUNG MENGGUNAKAN JARINGAN SYARAF TIRUAN BERDASARKAN CITRA EKG 12 SANDAPAN (Studi Kasus Kelainan Jantung Iskemia dan Aritmia)
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Luthfi, F., dan Arifin, A., 2012, Klasifikasi Sinyal Elektrokardiografi Menggunakan Wavelet Transform Dan Neural Network, *The 13th Seminar On Intelligent Technology and Its Applications*, Teknik Elektro, ITS Surabaya, ISSN: 2252-8296.

Madhukar, S., Agaian, S., dan Chronopoulos, A.T., 2012, New Decision Support Tool for Acute Lymphoblastic Leukemia Classification, *Journal of SPIE-IS&T*, Vol.8295 829518-1.

Mahesh, V., Kandaswamy, A., Vimal, C., dan Sathish, B., 2009, ECG Arrhythmia Classification Based On Logistic Model Tree, *J. Biomedical Science and Engineering*, doi:10.4236/jbise.2009.26058, 405-411.

Marinelli, M., Positano, V., Nekolla, S.G., Marcheschi, P., Todiere, G., Esposito, N., Puzzuoli, S., L'Abbate, G.A., Marraccini, P., dan Neglia, D., 2013, Hybrid Image Visualization Tool For 3D Integration Of CT Coronary Anatomy and Quantitative Myocardial Perfusion PET, *Int J CARS 8*, DOI 10.1007/s11548-012-0777-3, 221–232.

Mateo, J., Torres, A., dan Rieta, J.J., 2011, An Efficient Method for Ectopic Beats Cancellation Based on Radial Basis Function, *33rd Annual International Conference of the IEEE EMBS Boston*, Massachusetts USA, August 30 - September 3.

Mauko, I.C., 2010, Klasifikasi Detak Elektrokardiogram Menggunakan Transformasi Wavelet Diskrit dan Adaptive Neuro Fuzzy Inference System, *Tesis*, Prodi Teknik Elektro, Jurusan Ilmu-ilmu Teknik, Fakultas Teknik, Universitas Gadjah Mada Yogyakarta.

Mehdi, B., Khan, T., dan Ali, Z.A., 2013, *Artificial Neural Network Based Electrocardiography Analyzer*, Electronic Engineering Sir Syed University of Engineering & Technology, Karachi, Pakistan.

Minchole, A., Jager, F., dan Laguna, P., 2007, Discrimination between Demand and Supply Ischemia Episodes in Holter Recordings, *Proceedings of the 29th Annual International Conference of the IEEE EMBS Cité Internationale*, Lyon, France, August 23-26, 2579-2582.

Mo, Y., dan Xu, S., 2010, Application of SVM Based On Hybrid Kernel Function In Heart Disease Diagnoses, *International Conference on Intelligent Computing and Cognitive Informatics*, IEEE Computer Society, 462-465.

Nambiar, V.P, Khalil-Hani, M., Sia, C.W., dan Marsono, M.N., 2012, *Evolvable Block-Based Neural Networks For Classification of Driver Drowsiness Based on Heart Rate Variability*, Microelectronics & Computer Engineering Department, Faculty of Electrical Engineering, Universiti Teknologi Malaysia.

Nasiri, J.A., Sabzekar, M., Yazdi, H.S., Naghibzadeh, M., dan Naghibzadeh, B., 2009, Intelligent Arrhytmia Detection Using Genetic Algorithm and Empahtic SVM (ESVM), *Third UKSim European Symposium On Computer*

UNIVERSITAS GADJAH MADA
MODEL IDENTIFIKASI KELAINAN JANTUNG MENGGUNAKAN JARINGAN SYARAF TIRUAN BERDASARKAN CITRA EKG 12 SANDAPAN (Studi Kasus Kelainan Jantung Iskemia dan Aritmia)
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Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Modeling and Simulation, IEEE Computer Society, DOI 10.1109/EMS, 112-117.

Neto, A.B., Nievola, J.C., Figueredo, M.V.M., dan Rogal Jr., S.R., 2010, *Automatic Detection of Cardiac Arrhythmias Using Wavelets, Neural Networks and Particle Swarm Optimization*, Programa de Pós-Graduação em Informática da Pontificia Universidade Católica do Paraná, Brazil, 194 – 198.

Noh, Y.H., dan Jeong, D.U., 2014, Implementation of a Data Packet Generator Using Pattern Matching for Wearable ECG Monitoring Systems, *Sensors*, ISSN 1424-8220, 12623-12639; doi:10.3390/s140712623, Basel, Switzerland.

Novák, D., 2003, *Electrocardiogram Signal Processing using Hidden Markov Models*, Czech Technical University in Prague, Faculty of Electrical Engineering, Department of Cybernetics, Technick´a 2, 166 27, Praha 6, Czech Republic.

Nurraharjo, E., 2011, Implementasi Morfologi Concept and Technique dalam Pengolahan Citra Digital Untuk Menentukan Batas Obyek dan Latar Belakang Citra, *Jurnal Teknologi Informasi DINAMIKA,*Vol.16, No.2, Juli, pp.134-138, ISSN:0854-9524.

Özbay, Y., dan Karlik, B., 2001, A Recognition Of ECG Arrhythmias Using Artificial Neural Network, *Proceedings – 23rd Annual Conference – IEEE/EMBS*, Oct.25-28, Istanbul, Turkey, 1-5.

Pachauri, A., dan Bhuyan, M., 2014, Synthesis ofECG from Arterial Blood Pressure and Central Venous Pressure Signals using Artificial Neural Network, *IEEE International Conference on Recent Advances and Innovations in Engineering (ICRAIE-2014)*, May 09-11, Jaipur, India.

Pan, J., dan Tompkins, W.J., 1985, "A Real-Time QRS Detection Algorithm", *IEEE Transactions On Biomedical Engineering*, Vol. BME-32, No. 3, March.

Pan, S.T., Wu, Y.H., Kung, Y.L., dan Chen, H.C., 2013, Heartbear Recognition from ECG Signals Using Hidden Markov Model with Adaptive Features, *14th ACIS International Conference on Software Engineering*, Artificial Intelligence, Networking and Parallel/Distributed Computing, 586-591.

Pantelopoulos, A., dan Bourbakis, N., 2011, ECG Beat Classification using Optimal Projections in Overcomplete Dictionaries, *23rd IEEE International Conference on Tools with Artificial Intelligence*, 1099-1105.

Parák, J., dan Havlík, J., 2011, "ECG Signal Processing and Heart Rate Frequency Detection Methods", *In Proceedings of Technical Computing Prague*.

Patel, A.M., Gakare, P.K., dan Cheeran, A.N., 2012, Real Time ECG Feature Extraction and Arrhythmia Detection on a Mobile Platform, *International Journal of Computer Applications*, Vol.44, No.23, pp.40-45.

UNIVERSITAS GADJAH MADA
MODEL IDENTIFIKASI KELAINAN JANTUNG MENGGUNAKAN JARINGAN SYARAF TIRUAN BERDASARKAN CITRA EKG 12 SANDAPAN (Studi Kasus Kelainan Jantung Iskemia dan Aritmia)
DARWAN, Prof. Dra. Sri Hartati, M.Sc., Ph.D. : Drs. Retantyo Wardoyo, M.Sc., Ph.D. : Prof. Dr. dr. Budi Yuli Setianto
Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Pathoumvanh, S., Hamamoto, K., dan Indahak, P., 2014, Arrhythmias Detection and Classification base on Single Beat ECG Analysis, *The 4th Joint International Conference on Information and Communication Technology, Electronic and Electrical Engineering (JICTEE)*.

Patra, D., Das, M.K., dan Pradhan, S., 2010, Integration of FCM, PCA and Neural Networks for Classification of ECG Arrhythmias, *IAENG International Journal of Computer Science*, 36:3, IJCS_36_3_05, 1-5.

Perlman, O., Zigel, Y., Amit, G., dan Katz, A., 2012, Cardiac Arrhythmia Classification in 12-Lead ECG Using Synthetic Atrial Activity Signal, *IEEE 27th Convention of Electrical and Electronics Engineers in Israel*, 1-4.

Pingale, S.L., 2014, Using Pan Tompkin's Method, ECG Signal Processing and Diagnose Various Diseases in MATLAB, *Proceeding of IRF International Conference*, April 13th, India.

Pohl, J., Sáblík, V., and Polách, P., 2008, ECG Analysis With Using Of Neural Networks, *http://www.feec.vutbr.cz/EEICT/2008/sbornik/03-Doktorske%20projekty/03-Kybernetika%20a%20automatizace/05-xpohlj00.pdf* , diakses 25 Agustus 2014.

Pramuyanti, R. K, 2004, Klasifikasi Pola Isyarat EKG Menggunakan Logika Fuzzy, *Tesis*, Program Studi Teknik Elektro Universitas Gajah Mada, Yogyakarta.

Purnamasari, R., Hadiyoso, S., Rohmah, Y.S., dan Ramdani, A.Z., 2014, Perhitungan Denyut Jantung Berdasar Sinyal EKG Berbasis FPGA.

Purwanti, E., Chandra A.S.F., Pujiyanto, Bustomi, M.A., 2013, Desain Sistem Klasifikasi Kelainan Jantung Menggunakan Learning Vector Quantization, *Jurnal Fisika dan Aplikasinya*, Volume 9, Nomor 2, Juni.

Puspitaningrum, D., 2006, *Pengantar Jaringan Syaraf Tiruan*, Andi Offset Yogyakarta.

Rabhi, E., dan Lachiri, Z., 2013, SVM Based On Personal Identification System Using Electrocardiograms, *International Conference on Control, Engineering & Information Technology (CEIT'13) Proceedings Engineering & Technology*, Vol.2, 2013, 176-180.

Rai, H.M., Trivedi, A., Shukla, S., dan Dubey, V., 2012, ECG Arrhythmia Classification using Daubechies Wavelet and Radial Basis Function Neural Network, *NIRMA University International Conference On Engineering (NUiCONE)*, 06-08 December.

Rosiawati, I., 2010, *Aplikasi Untuk Mendiagnosa Penyakit Jantung Pada Manusia*, Prodi Matematika, Jurusan Matematika, Fakultas MIPA, Universitas Diponegoro, Semarang.

UNIVERSITAS GADJAH MADA
MODEL IDENTIFIKASI KELAINAN JANTUNG MENGGUNAKAN JARINGAN SYARAF TIRUAN BERDASARKAN CITRA EKG 12 SANDAPAN (Studi Kasus Kelainan Jantung Iskemia dan Aritmia)
DARWAN, Prof. Dra. Sri Hartati, M.Sc., Ph.D. : Drs. Retantyo Wardoyo, M.Sc., Ph.D. : Prof. Dr. dr. Budi Yuli Setianto
Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Rupam, 2011, *The Difference between Object Detection and Object Recognition*, Tersedia di http://grasshoppernetwork.com/showthread.php?tid=562.html [diakses 15-8-2013].

Samadi, S., dan Shamsollahi, M. B., 2014, ECG Noise Reduction Using Empirical Mode Decomposition Based on Combination of Instantaneous Half Period and Soft-Tresholdingi¸ *Middle East Conference on Biomedical Engineering (MECBME)*, February 17-20, Doha, Qatar.

Samarsinghe, S., 2007, *Neural Networks for Applied Sciences and Engineering: From Fundamentals to Complex Pattern Recognition*, Auerbach Publications: Taylor & Francis Group.

Sarma, P., Nirmala, S.R., dan Sarma, K.K., 2014, ECG Classification using Wavelet Subband Energy based Features, *International Conference on Signal Processing and Integrated Networks (SPIN)*, 785–790.

Sasikala, P., dan Banu, W., 2011, Extraction of P wave and T wave in Electrocardiogram using Wavelet Transform, *International Journal of Computer Science and Information Technologies (IJSIT)*, Vol. 2, 489-493.

Sasirekha, A., dan Kumar, P.G., 2013, Support Vector Machine For Classification of Heartbeat Time Series Data, *International Journal of Emerging Science and Engineering (IJESE)*, ISSN: 2319–6378, Volume-1, Issue-10, August 2013, 38-41.

Sathyapriya, L., Murali, L., dan Manigandan, T., 2014, Analysis and Detection R-Peak Detection using Modified Pan-Tompkins Algorithm, *International Conference on Advance Communication Control and Computing Technologies (ICACCCT)*, IEEE.

Sayari, E., dan Yaghoobi, M., 2013, A model presented for classification ECG signals base on Case-Based Reasoning, *Journal of Soft Computing and Applications*, Volume 2013, Year 2013 Article ID jsca-00020, doi:10.5899/2013/jsca-00020, 1-9.

Schalkoff, R., 1992, *Pattern Recognition (Statistical, Structural, and Neural Approaches)*, John Wiley & Sons, Inc.

Sekar, B.D., Dong, M.C., Shi, J., dan Hu X.Y., 2012, Fused Hierarchical Neural Networks for Cardiovascular Disease Diagnosis, *IEEE Sensors Journal*, Vol. 12, No. 3, March, 644-650.

Selwyn AP., dan Braunwald E., 2002, *Ischemic heart disease*. Harrison's principles of internal medicine, New York: McGraw-Hill.

Shapiro, L.G. dan Stockman, G.C., 2002, *Computer Vision*, Prentice Hall.

UNIVERSITAS GADJAH MADA
MODEL IDENTIFIKASI KELAINAN JANTUNG MENGGUNAKAN JARINGAN SYARAF TIRUAN BERDASARKAN CITRA EKG 12 SANDAPAN (Studi Kasus Kelainan Jantung Iskemia dan Aritmia)
DARWAN, Prof. Dra. Sri Hartati, M.Sc., Ph.D. : Drs. Retantyo Wardoyo, M.Sc., Ph.D. : Prof. Dr. dr. Budi Yuli Setianto
Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Sharma, A., dan Sharma, T., 2011, ECG Beat Recognition using Principal Components Analysis and Artificial Neural Network, *International Journal of Electronics Engineering*, 55–58.

Shi, W., dan Kheidorov, I., 2010, Hybrid Hidden Markov Models for ECG Segmentation, *Sixth International Conference on Natural Computation (ICNC)*, 3323-3328.

Shih, D., Chiang, H., Lin, B., dan Lin, S., 2010, An Embedded Mobile ECG Reasoning System for Elderly Patients, *IEEE Transactions On Information Technology In Biomedicine*, Vol. 14, No. 3, May, 854-865.

Shih, D., Chiang, H., dan Shih, M., 2013, ECG Identification of Arrhythmias by using an Associative Petri Net, *IEEE*.

Siebes, M., Kolyva, C., Verhoeff, B.J., Piek, J.J., dan Spaan, J.A., 2009, Potential and Limitations of Wave Intensity Analysis in Coronary Arteries, *Med Biol Eng Comput 47*, DOI 10.1007/s11517-009-0448-x, 233–239.

Smeltzer S.C., Bare B.G., Brunner dan Suddarth's, 2000, *Textbook of Medical Surgical Nursing*, 9th Ed. Lippincott Williams & Wilkins.

Solomon, C., dan Breckon, T., 2011, *Fundamentals of Digital Image Processing: A Practical Approach with Examples in Matlab*, 1st Edition, Wiley-blackwell Press.

Stefko, K., 2008, Application of MLBP Neural Network for Exercise ECG Test Records Analysis in Coronary Artery Diagnosis, *Information Tech. in Biomedicine*, ASC 47, 179–183.

Supardi, J., dan Anindita, B., 2015, Pengembangan Arsitektur Jaringan Syaraf Tiruan Untuk Pengenalan Ekspresi Wajah Manusia.

Surtono, A., 2012, Analisis Klasifikasi Sinyal EKG Berbasis Wavelet Dan Jaringan Syaraf Tiruan, *Tesis*, Prodi Teknik Elektro, Minat Studi Magister Teknik Instrumentasi, Jurusan Teknik Elektro dan Teknologi Informasi, Fakultas Teknik, Universitas Gadjah Mada Yogyakarta.

Swamy, P., Jayaraman, S., dan Chandra, M.G., 2010, An Improved Method for Digital Time Series Signal Generation From Scanned ECG Records, *International Conference on Bioinformatics and Biomedical Technology*.

Tan, F., Graciani, G., Susanti, Steven, dan Lukas, S., 2012, Aplikasi Prediksi Harga Saham Menggunakan Jaringan Syaraf Radial Basis Function Dengan Metode Pembelajaran Hybrid, *Jurnal Ilmiah Ilmu Komputer*, Vol.8, No.2, Maret, 175-181.

Tan, T.H., Chang, C.S., Chen, Y.F., dan Lee, C., 2008, Implementation of a Portable Personal EKG Signal Monitoring System, *Proceedings First International Conference*, ICMB 2008, Hong Kong, China, January 4-5, 2008, 122-128.

UNIVERSITAS GADJAH MADA
MODEL IDENTIFIKASI KELAINAN JANTUNG MENGGUNAKAN JARINGAN SYARAF TIRUAN BERDASARKAN CITRA EKG 12 SANDAPAN (Studi Kasus Kelainan Jantung Iskemia dan Aritmia)
DARWAN, Prof. Dra. Sri Hartati, M.Sc., Ph.D. : Drs. Retantyo Wardoyo, M.Sc., Ph.D. : Prof. Dr. dr. Budi Yuli Setianto
Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Tazi, I., 2012, Pemodelan Kecerdasan Buatan Untuk Pengenalan Citra Elektrokardiografi (EKG), *http://ejournal.uin-malang.ac.id/index.php/lemlit/article/view/2040*, diakses: 10 April 2014.

Thaler, M.S., 2014, *Satu-satunya Buku EKG Yang Anda Perlukan*, Buku Kedokteran ECG.

Thandar, A.M., dan Khaing, M.K., 2012, Radial Basis Function (RBF) Neural Network Classification based on Consistency Evaluation Measure, *International Journal of Computer Applications*, Vol.54, No.15.

Theodoridis, S., dan Koutroumbas, K., 2009, *Pattern Recognition*, Elsevier Inc.

Tompkins, W.J., 1993, *Biomedical Digital Signal Processing*, Prentice-Hall Inc., Englewood Cliffs, N.J., Eth Bib: +521 458.

Tonekabonipour, H., Emam, A., Teshnelab, M., dan Shoorehdeli, M.A., 2010, Ischemia Prediction via ECG using MLP and RBF predictors with ANFIS Classifiers, *Seventh International Conference on Natural Computation*, 776-780.

Tonekabonipour, H., Emam, A., Teshnelab, M., dan Shoorehdeli, M.A., 2011, Comparison of Neuro-Fuzzy Approaches With Artificial Neural Networks for the Detection of Ischemia in ECG signals, *IEEE*, 4045-4048.

Tsipouras, M.G., Exarchos, T.P., Fotiadis, D.I., Kotsia, A.P., Vakalis, K.V., Naka, K.K., dan Michalis, L.K., 2008, Automated Diagnosis of Coronary Artery Disease Based on Data Mining and Fuzzy Modeling, *IEEE Transactions On Information Technology In Biomedicine*, Vol. 12, No. 4, July, 447-458.

Valenzuela, O., Rojas, F., Herrera, L.J., Ortuno, F., Banos, O., Ruiz, G., Tribak, H., Pomares, H., dan Rojas, I., 2013, Intelligent systems to autonomously classify several arrhythmia using information from ECG, *IEEE Computer Society*, 1038-1045.

Valupadasu, R., dan Chunduri, B.R.R., 2012, Identification of Cardiac Ischemia Using Spectral Domain Analysis of Electrocardiogram, *14th International Conference on Modelling and Simulation*, IEEE Computer Society, 92-96.

Vidya, M.J., dan Kavya, D., 2013, "Analysis Of ECG Signal Using Matlab For The Detection Of Ischemia", *International Journal Of Inovative Research & Development*, Vol.2, Issue:4, April.

Wang, Y., Song, L., dan Kang, S., 2010, Arrhymia Recognition Based on EMD and Support Vector Machines, *IEEE*, 978-1-4244-4713-8.

Waseem, K., Javed, A., Ramzan, R., dan Farooq, M., 2011, Using Evolutionary Algorithms for ECG Arrhytmia Detection and Classification, *Seventh International Conference on Natural Computation*, IEEE, 2386-2390.

Wiyanti, D.T., 2012, Peramal Deret Waktu Menggunakan Model Jaringan Syaraf Fungsi Basis Radial (RBFNN) Dan Auto Regressive Integrated Moving Average (ARIMA), *Tesis*, Ilkom, MIPA, UGM Yogyakarta.

UNIVERSITAS GADJAH MADA
MODEL IDENTIFIKASI KELAINAN JANTUNG MENGGUNAKAN JARINGAN SYARAF TIRUAN BERDASARKAN CITRA EKG 12 SANDAPAN (Studi Kasus Kelainan Jantung Iskemia dan Aritmia)
DARWAN, Prof. Dra. Sri Hartati, M.Sc., Ph.D. : Drs. Retantyo Wardoyo, M.Sc., Ph.D. : Prof. Dr. dr. Budi Yuli Setianto
Universitas Gadjah Mada, 2018 | Diunduh dari http://etd.repository.ugm.ac.id/

Yahya, A.F., 2010, *Menaklukkan Pembunuh No.1 Mencegah dan Mengatasi Penyakit Jantung Koroner Secara Tepat dan Cepat*, Bandung: Qanita.

Yang, J.G., Kim, J.K., Kang, U.G., dan Lee, Y.H., 2013, *Coronary Heart Disease Optimization System On Adaptive-Networkbased Fuzzy Inference System and Linear Discriminant Analysis* (ANFIS–LDA), Pers Ubiquit Comput, DOI 10.1007/s00779-013-0737-0, 1-12.

Yang, G., Ren, Y., Pan, Q., Ning, G., Gong, S., Cai, G., Zhang, Z., Li, L., dan Yan, J., 2010, *A* Heart Failure Diagnosis Model Based On Support Vector Machine, *3rd International Conference on Biomedical Engineering and Informatics (BMEI)*, 1105-1108.

Yasak, A., dan Arifin, A., 2012, Ekstraksi Parameter Temporal Sinyal ECG Menggunakan Difference Operation Method, Teknik Elektro, ITS Surabaya, *The 13th Seminar On Intelligent Technology and Its Applications*, ISSN: 2252-8296.

Yeh, Y.C., Chiou, C.W., dan Lin, H.J., 2012, Analyzing ECG For Cardiac Arrhythmia Using Cluster Analysis, *Expert Systems with Applications*, 39, 1000–1010.

Yeh, Y.C., Chiang, C.T., dan Lin, H.J., 2011, Principal Component Analysis Method for Detectionand Classification of ECG Beat, *11th IEEE International Conference on Bioinformatics and Bioengineering*, 318-322.

Zhang, Y., Liu, F., Zhao, Z., Li, D., Zhou, X., and Wang, J., 2012, Studies On Application of Support Vector Machine in Diagnose of Coronary Heart Disease, *http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6310380*. Diakses 25 Agustus 2014.

Zheng Q., Chen C., Li Z., Huang A., Jiao B., Duan X., dan Xie L, 2013, *A Novel Multi-Resolution SVM (MR-SVM) Algorithm to Detect ECG Signal Anomaly in WE-CARE Project*, Center for Wireless Communication and Signal Processing, School of Electronic Engineering and Computer Science, Peking University, Beijing, China.

Zhuowei, H., 2006, Advances In The Application Of Mathematical Morphology In Spatial Data Processing and Analysis, *ISPRS Commission VII Mid-term Symposium "Remote Sensing: From Pixels to Processes"*, Enschede, Netherlands.