Bestia Kumala Wardani, 2018. **Aplikasi Ekstraksi Fitur *Gray Level Run Length Matrices* (GLRLM) untuk Deteksi Retinopati Diabetik Berbasis Jaringan Saraf Tiruan**. Skripsi dibawah bimbingan Dr. Riries Rulaningtyas, S.T., M.T. dan Endah Purwanti, S.Si., M.T., Program Studi S1 Teknik Biomedis, Departemen Fisika, Fakultas Sains dan Teknologi, Universitas Airlangga.

ABSTRAK

Retinopati diabetik merupakan suatu komplikasi mikrovaskuler diabetes mellitus yang menyerang mata dan dapat menyebabkan kebutaan. Pemeriksaan retinopati diabetik saat ini dilakukan dengan menggunakan teknik *fundus photography*. Citra yang dihasilkan dari teknik tersebut dikaji oleh *ophthalmologist* secara manual. Penelitian ini bertujuan untuk mengembangkan metode deteksi retinopati diabetik sesuai tingkat keparahannya yaitu normal, *Non-Proliferative Diabetic Retinopathy* (NPDR), dan *Proliferative Diabetic Retinopathy* (PDR). Deteksi retinopati diabetik ini dilakukan dengan memanfaatkan metode ekstraksi fitur tekstur *Gray Level Run Length Matrices* (GLRLM). Fitur tekstur yang digunakan antara lain: *Short Run Emphasis* (SRE), *Long Run Emphasis* (LRE), *Grey Level Non-Uniformity* (GLN), *Run Length Non-Uniformity* (RLN), dan *Run Precentage* (RP). Kelima fitur tekstur tersebut kemudian digunakan sebagai *input* jaringan saraf tiruan *backpropagation*. Parameter-parameter divariasikan pada tahap pelatihan jaringan saraf tiruan *backpropagation.* Data yang digunakan dalam penelitian ini sebanyak 110 citra fundus retina yang terdiri dari 20 citra fundus retina normal, 45 citra fundus retina NPDR, dan 45 citra fundus retina PDR. Hasil akurasi tertinggi yang didapatkan pada tahap pelatihan sebesar 97,14% dan tahap pengujian sebesar 92,5%.

Kata kunci: retinopati diabetik, fitur tekstur, g*ray level run length matrices*, *backpropagation*, citra fundus retina

Bestia Kumala Wardani, 2018. **Application of Gray Level Run Length Matrices (GLRLM) Feature Extraction for Detection of Diabetic Retinopathy Based on Artificial Neural Network.** Thesis under the guidance of Dr. Riries Rulaningtyas, S.T., M.T. and Endah Purwanti, S.Si., M.T., Bachelor of Biomedical Engginering, Departemen of Physics, Faculty of Science and Technology, Airlangga University**.**

ABSTRACT

Diabetic Retinopathy is a microvascular complication of diabetes mellitus that attacks the eyes and can cause blindness. Diabetic retinopathy inspection is currently performed by using fundus photography techniques. The image which is generated from this technique is studied by ophthalmologist manually. This research aims to develop the detection method on diabetic retinopathy according to its normal severity, Non-Proliferative Diabetic Retinopathy (NPDR) and Proliferative Diabetic Retinopathy (PDR). The detection on diabetic retinopathy is performed by using the method of extracting the texture feature of Gray Level Run Length Matrices (GLRLM). The texture features which are used such as: Short Run Emphasis (SRE), Long Run Emphasis (LRE), Grey Level Non-Uniformity (GLN), Run Length Non-Uniformity (RLN), and Run Percentage (RP). These five texture features above are then used as artificial neural network inputs of backpropagation. Parameters are varied at the training stage of artificial neural network of backpropagation. Data used in this study are 110 retinal fundus images which consist of 20 normal retinal fundus images, 45 retinal fundus images of NPDR, and 45 retinal fundus of PDR. The result shows that the highest accuracy obtained in the training phase is 97,14% and in the testing phase is 92,5%.

Keywords: diabetic retinopathy, texture feature, gray level run length matrices, backpropagation, retinal fundus image