



ICTS 2016

PROCEEDINGS OF

KAAN
ya Kartika
A YA

6 International Conference on
Information & Communication
Technology and Systems (ICTS)

October 12th, 2016

Department of Informatics, Faculty of Information Technology
Institut Teknologi Sepuluh Nopember (ITS)



PROCEEDINGS OF

**2016 INTERNATIONAL CONFERENCE ON INFORMATION &
COMMUNICATION TECHNOLOGY AND SYSTEMS (ICTS)**

Surabaya, October 12th, 2016

(ISSN: 2338-185X)

(ISBN: 978-1-5090-1379-1)

Organized by
Department of Informatics
Faculty of Information Technology
Institut Teknologi Sepuluh Nopember (ITS)
Surabaya, Indonesia

NO. INDUK	8045-1617
TGL. TERIMA	13/16
BELI HADIAH	P. Agus ICT
NO. BUKU	005.3 Pro 2016

- T3.14 Reduce Noise in The Binary Image Using Non Linear Spatial Filtering of Mode
Teady Matus Surya Mulyana
pp. 135-139
- T3.15 Heart Murmurs Extraction Using the Complete Ensemble Empirical Mode Decomposition and the Pearson Distance Metric
Jusak Jusak, Ira Puspasari and Pauladie Susanto
pp. 140-145
- T3.16 Development of Early Detection of Complication Organ Kidney Disease Caused by Diabetes Mellitus Based on Color Constancy
Agus Prayitno, Adhi Wibawa and Mauridhi Purnomo
pp. 146-149
- T3.17 Digital Color Classification for Colorful Cross Stitch Threads Using RGB+Euclidean Distance and LAB+CIE94
David Setiabudi, Sani M. Isa and Bambang Heru Iswanto
pp. 150-156
- T3.18 Application Development for Recognizing Type of Infant's Cry Sound
Welly Limantoro, Chastine Fatichah and Umi Laili Yuhana
pp. 157-161
- T3.19 Opinion Classification Using Maximum Entropy and K-Means Clustering
Amir Hamzah and Naniek Widyastuti
pp. 162-166
- T3.20 Enriching English Into Sundanese and Javanese Translation List Using Pivot Language
Arie Suryani, Isye Arieshanti, Banu Yohanes, Muhammad Subair, Sari Dewi Budiwati and Bagus Rintyarna
pp. 167-171
- T3.21 Mixed Vapour Identification Using Partition Column-QCMs and Artificial Neural Network
Eva Agustin, Muhammad Rivai and Achmad Arifin
pp. 172-177
- T3.22 BencanaVis Visualization and Clustering of Disaster Readiness Using K Means with R Shiny A Case Study for Disaster, Medical Personnel and Health Facilities Data at Province Level in Indonesia
Renny Kusumawardani, Irmasari Hafidz and Septa Putra
pp. 178-186
- T3.23 Dynamics Simulation of Air Passenger Forecasting and Passenger Terminal Capacity Expansion Scenario in Yogyakarta Airport
Bilqis Amaliah, Azizha Zeinita and Erma Suryani
pp. 187-192

Early Detection Study of Kidney Organ Complication Caused By Diabetes Mellitus using Iris Image Color Constancy

Agus Prayitno

Informatics Engineering, Widya Kartika University
Surabaya, Indonesia
agus.prayitno.sbv@gmail.com

Adhi Dharma Wibawa¹, Mauridhi Hery Pumomo²
Multimedia and Network Engineering, Institut Teknologi
Sepuluh Nopember, Surabaya, Indonesia
adhiosa@te.its.ac.id, herv@te.its.ac.id

Abstract— Diabetes Mellitus is now becoming a mass silent killer in the society because it does not show any signs previously to the patients until it has been in the dangerous level. Most people just realize their diabetic condition when the stage was already too late. In many cases, Diabetes Mellitus causes many complications to other organs, such as kidney, cardiovascular, liver or blood pressure. This study is analyzing the early stage of kidney complication caused by Diabetes Mellitus by analyzing iris image of the patient. Nowadays, there have been several tools that can be used to analyze the condition of patient kidney including blood test. However, a new approach is needed for a faster, simpler and non-invasive detection system. Iridology is a new branch of science that studying the condition of human organ via iris image. Based on Iridology, the structures of iris fibers are relating to the condition of certain organ in human body. This study is exploring the relationship of Kidney organ complication with the iris fibers structures (image of iris) and validated the result with patient's medical records. An existing iris chart introduced by Bernard Jensen was used to analyze the Kidney organ condition. The location of kidney organ in iris is at 200° – 210° when image of iris was divided by 360°. Image of iris was taken by using a specific iris camera. Region of interest (ROI) was then determined by using the iris chart. Color constancy and independent component analysis were used to analyze the ROI of iris image. Broken tissue in iris image would be the feature for detecting the complication of kidney organ. From 47 participants, the result showed that 76% of participants showing a relation of kidney' complication with their iris image. This result conclude that iris image analysis can be used as an alternative way in monitoring the condition of internal organ such as kidney's complication.

Keywords—Iridology, Kidney Complication, Early detection system, Diabetes Mellitus, Iris image analysis

I. Introduction

Diabetes Mellitus (DM) is a chronic metabolic disorder due to the inability of pancreas to produce sufficient insulin, or the condition in which the body is unable to efficiently make use the produced insulin. Insulin is a hormone to regulate the balance level of glucose in the blood. Insulin deficiency results in the increase of glucose level in blood. There are two categories of DM: DM type 1 and DM type 2. Diabetes type 1 is referred as insulin dependent or juvenile or childhood-onset diabetes or simply the lack of insulin production. Thus, people with DM type 1 have to inject themselves with insulin daily. DM type 2 is referred as non-insulin-dependent or adult-onset diabetes, simply caused by the ineffective use of insulin by the body [2]. On the other hand, DM gestational is a hyperglycemia as the results of pregnancy. From various epidemiology researches in Indonesia conducted by diabetes centers in the year of 1980s, the prevalence of DM for people aged 15 years and more of 1.5% until 2.3%. The Household Survey (SKRT) in 2001 showed DM prevalence for populations aged 25-64 years old in Java and Bali by 7.5%. [2]

Iridology is a body frailty analysis technique based on the shape and structure inside the iris of black eyes (around the eye-pupil) [1,3,4,5,7,9]. The eye-iris can picture the body system, its strengths and weaknesses, phases of illness and its changes due to natural process. By analyzing the structure and colors of eye-iris, vital information about someone's body can be obtained. Iris is like the mirror of body; anything happening in the body will likely be reflected in a sign in eye-iris. Nowadays, Iris has been known widely as a new branch of science. Some researchers believed that Iridology has becoming a new, non-invasive and alternative way in analysing human's organ, however, some others think that Iridology is a pseudo-science, meaning that they

doubt the th
condition o
Iridology s
regarding th
organ [1,3,4
image (brok
Kidney Orga
All of parti
Mellitus for
early stage o
The detectio
patients med
kidney org
Constancy w
kidney organ
image proces
iris by elimin
here refers to
the flash from

Data collec

In this st
special irido
picture in vi
minutes. All
have been :
(supported by
picture, the v
Avidemux vi
patient togeth
before perfor
patient's iris).
identified b
complication
without any
Creatinine ar
Table 1 below

TABLE

No	Code
1	P-001
2	P-002
3	P-003
4	P-004
5	P-005