

(54) Title of the invention : AN INTELLIGENT SYSTEM FOR DIABETIC RETINOPATHY IDENTIFICATION USING EYE FUNDUS IMAGES

<p>(51) International classification :G06N0003040000, G06K0009620000, G16H0050200000, G06T0007000000, A61B0005000000</p> <p>(86) International Application No :NA Filing Date :NA</p> <p>(87) International Publication No : NA</p> <p>(61) Patent of Addition to Application Number :NA Filing Date :NA</p> <p>(62) Divisional to Application Number :NA Filing Date :NA</p>	<p>(71)Name of Applicant : 1)Dr. G. PRATHIBHA Address of Applicant :Dr. YSR ANUCET, ACHARYA NAGARJUNA UNIVERSITY, NH16, Nagarjuna Nagar, Guntur, Andhra Pradesh 522510 ----- ----- 2)Dr. J. BHUVANA 3)Dr. Y. RAKESH 4)CHANDIKA.VIJAYA SEKHAR BABU 5)P. MYTHRI 6)SK RIZWAN KHADAR 7)G. BLESSY 8)P.DEVASUDHA Name of Applicant : NA Address of Applicant : NA (72)Name of Inventor : 1)Dr. G. PRATHIBHA Address of Applicant :Dr. YSR ANUCET, ACHARYA NAGARJUNA UNIVERSITY, NH16, Nagarjuna Nagar, Guntur, Andhra Pradesh 522510 ----- ----- 2)Dr. J. BHUVANA Address of Applicant :A.D.M. College for Women (Autonomous), No.1, College Road, Nambiyar Nagar, Nagapattinam, Tamil Nadu 611001 ----- 3)Dr. Y. RAKESH Address of Applicant :Military College of Electronics and Mechanical Engineering, Trimulgherry Post, Secunderabad, Telangana 500015 ----- ----- 4)CHANDIKA.VIJAYA SEKHAR BABU Address of Applicant :Krishna University College of Engineering and Technology, Rudravaram, kona road, Machilipatnam Rural, Andhra Pradesh 521004 ----- ----- 5)P. MYTHRI Address of Applicant :Dr. YSR ANUCET, ACHARYA NAGARJUNA UNIVERSITY, NH16, Nagarjuna Nagar, Guntur, Andhra Pradesh 522510 ----- ----- 6)SK RIZWAN KHADAR Address of Applicant :Dr. YSR ANUCET, ACHARYA NAGARJUNA UNIVERSITY, NH16, Nagarjuna Nagar, Guntur, Andhra Pradesh 522510 ----- ----- 7)G. BLESSY Address of Applicant :Dr. YSR ANUCET, ACHARYA NAGARJUNA UNIVERSITY, NH16, Nagarjuna Nagar, Guntur, Andhra Pradesh 522510 ----- ----- 8)P.DEVASUDHA Address of Applicant :St. Martin’s Engineering College, Sy No. 98 & 100, Dhulapally Road, Dhulapally, Kompally, Secunderabad, Telangana-500100. ----- -----</p>
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(57) Abstract :

Automated Diabetic Retinopathy (DR) detection, screening and diagnosis are critical to save vision loss of patients and assist the ophthalmologists in mass screening. DR screening aims at early treatment of the disease by detecting it before the stage progresses. Present DR analysis systems use digital funds images for diagnosis reducing the high cost of manual computation. Researchers are continuously persisting for automated screening systems which can reduce the subjective interpretation and screening burdens for ophthalmologists. This invention proposes different Convolution Neural Network (CNN) architectures with parameter tuning for DR classification. The proposed approach overcomes the class imbalance problem by fine tuning the network parameters. Different filter size variations are considered in the design and their altering response are analyzed at the classification output layer on a benchmark retinal image dataset. CNN model proposed in this invention provides an accuracy of 87.5% with cross entropy loss of 0.6370 with processing time of 1 minute and 23 seconds. Maximum accuracy improvement of 13% is achieved by the proposed approach over state of the art methods demonstrating its pre-eminence in fundus image classification.

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