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पेटेंट कार्यालय का एक प्रकाशन
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(54) Title of the invention : AN AUTOMATIC DETECTION AND CLASSIFICATION OF CORONARY ARTERY PLAQUE AND STENOSIS IN CORONARY CT ANGIOGRAPHY USING RECURRENT CNN

(51) International classification :G06N0003045000, G06N0003080000, G06T0007000000, A61B0005000000, G06N0003044000 (86) International Application No :NA Filing Date :NA (87) International Publication No : NA (61) Patent of Addition to Application Number :NA Filing Date :NA (62) Divisional to Application Number :NA Filing Date :NA	(71)Name of Applicant : 1)Mr. Sathish Krishna Anumula Address of Applicant :c/o Krishna Kishore Peram, Thorur, Thurkamjal, Hyderabad, RangaReddy, Telangana - 501511 ----- 2)Anantha Srilaxmi, UG Scholar, Dept. of CSE 3)Soujanya Madasthu, Associate Professor 4)Shiny R M, Assistant Professor, Department of Computer Science and Engineering 5)Renukhadevi. M, Assistant Professor 6)Dr Naina Wakode, AssociateProfessor, Anatomy 7)Dr. Sanaboina Leela Krishna, Professor & Head, Dept. of CSD 8)G.Praveen, Assistant Porofessor,Freshman Engineering 9)Daini Harini, UG Scholar, Dept. of CSE 10)Meesa Ganesh, UG Scholar, Dept. of CSE 11)Sangepu Varun Kumar, UG Scholar, Dept. of CSE 12)Kannuri Suhas, UG Scholar, Dept. of CSE Name of Applicant : NA Address of Applicant : NA (72)Name of Inventor : 1)Mr. Sathish Krishna Anumula Address of Applicant :c/o Krishna Kishore Peram, Thorur, Thurkamjal, Hyderabad, RangaReddy, Telangana - 501511 ----- 2)Anantha Srilaxmi, UG Scholar, Dept. of CSE Address of Applicant :St.Martin's Engineering College, Dhulapally, Secunderabad-500 100, Telangana, India. ----- 3)Soujanya Madasthu, Associate Professor Address of Applicant :Mallareddy College of Pharmaceutical Sciences, Maisammaguda (Village), Dulapally (Post), Secunderabad, Telangana 500014 ----- 4)Shiny R M, Assistant Professor, Department of Computer Science and Engineering Address of Applicant :St.Joseph's College of Engineering, OMR,Chennai-600119 ----- ----- 5)Renukhadevi. M, Assistant Professor Address of Applicant :Dr.D.Y.Patil Institute of Technology,Pimpri. Pune -411018 ----- ----- 6)Dr Naina Wakode, AssociateProfessor, Anatomy Address of Applicant :Atal Bihari Vajpayee Government Medical college, Vidisha 464001 ---- ----- 7)Dr. Sanaboina Leela Krishna, Professor & Head, Dept. of CSD Address of Applicant :St.Martin's Engineering College, Dhulapally, Secunderabad-500 100, Telangana, India. ----- 8)G.Praveen, Assistant Porofessor,Freshman Engineering Address of Applicant :St.Martin's Engineering College, Dhulapally, Secunderabad-500 100, Telangana, India. ----- 9)Daini Harini, UG Scholar, Dept. of CSE Address of Applicant :St.Martin's Engineering College, Dhulapally, Secunderabad-500 100, Telangana, India. ----- 10)Meesa Ganesh, UG Scholar, Dept. of CSE Address of Applicant :St.Martin's Engineering College, Dhulapally, Secunderabad-500 100, Telangana, India. ----- 11)Sangepu Varun Kumar, UG Scholar, Dept. of CSE Address of Applicant :St.Martin's Engineering College, Dhulapally, Secunderabad-500 100, Telangana, India. ----- 12)Kannuri Suhas, UG Scholar, Dept. of CSE Address of Applicant :St.Martin's Engineering College, Dhulapally, Secunderabad-500 100, Telangana, India. -----
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(57) Abstract :
Coronary artery disease (CAD) is a leading cause of morbidity and mortality worldwide, making early detection and classification of coronary artery plaque and stenosis critical for timely intervention. Traditional diagnostic methods relying on manual analysis of Coronary CT Angiography (CCTA) scans are time-consuming, prone to inter-observer variability, and require expert interpretation. This research proposes an automated detection and classification system using a Recurrent Convolutional Neural Network (RCNN) that integrates Convolutional Neural Networks (CNNs) for spatial feature extraction and Recurrent Neural Networks (LSTM/GRU) for temporal analysis. The system processes pre-segmented CCTA images, enhancing them with contrast adjustment, noise reduction, and artery segmentation techniques for improved accuracy. It then classifies arteries into normal, non-obstructive plaque, or significant stenosis categories, enabling a real-time, high-precision CAD detection model. Experimental results demonstrate high sensitivity, specificity, and accuracy, proving the system's ability to significantly reduce diagnosis time and enhance clinical decision-making. By offering an automated, scalable, and AI-driven solution, this research contributes to the advancement of predictive cardiovascular diagnostics, enabling faster and more reliable CAD detection in healthcare settings.