(54) Title of the invention : Deep Learning of Facial Depth Maps for Obstructive Sleep Apnea Prediction

(51) International classification :A61B0005000000, G06N0003080000, G06N0020000000, G06K0009620000, G06N0003040000	(71)Name of Applicant : 1)St. Martin's Engineering College Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ---------- Name of Applicant : NA Address of Applicant : NA (72)Name of Inventor : 1)Dr. B. Hari Krishna Professor, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ----------
(86) International Application No :PCT// / Filing Date :01/01/1900	2)Dr. Sanjay Kumar Suman Professor, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ----------
(87) International Publication No : NA	3)Mohd Mubeen Student, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ----------
(61) Patent of Addition to Application Number :NA Filing Date :NA	4)Palsam Manisha Student, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ----------
(62) Divisional to Application Number :NA Filing Date :NA	5)Syed Ashraf Student, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ---------- 6)Ankarugari Shreya Student, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ---------- 7)Sukavasi Sai Raghava Student, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ---------- 8)Nuchu Anusha Student, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ---------- 9)Brammadandi Sanjay ,Student,, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ---------- 10)M. Abhinay Kumar Reddy Student, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ---------- 11)Yata Lohith Sai Prasad Reddy Student, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ---------- 12)Baladarigowtham Kumar., Student, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ---------- 13)Mrs. G. Udaya Sree Assistant Professor, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ---------- 14)Kasturi Akhil ,Student, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ---------- 15)Y V Sujeeth ,Student, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ---------- 16)Darapureddi Lavanya, Student, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ---------- 17)Akkisetti John Ratna Kumar Student, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ---------- 18)Gantannagari Sathya Sai Ram, Student, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ---------- 19)Yash S, Student, ECE Address of Applicant :St.Martin's Engineering College, Dhulapally Kompally Secunderabad ---------- ----------

(57) Abstract :

Stress levels are rising at an alarming rate in today's society as a direct result of the increased level of competition in both the educational and professional spheres. This stress is a contributing factor in the development of a wide variety of ailments, including obstructive sleep apnea. Relaxation of the tongue and the muscles that line the airway may cause obstructive sleep apnea (OSA), which occurs when there is a recurring blockage in the airway during sleep. Snoring, difficulty sleeping because of choking or gasping for breath, and waking up feeling exhausted are typical symptoms of obstructive sleep apnea (OSA). The OSA diagnosis is time-consuming and expensive, both financially and in terms of lost productivity. Because of this, a significant number of patients continue to go untreated and are uninformed of the nature of their illness. Through a depth map of human face scans, the application of deep learning algorithms is employed to identify the condition. In comparison to a standard 2-D colour picture, the depth map offers much more information on the morphology of the face. The traditional machine learning models did not succeed in producing the best possible results in terms of prediction and classification accuracy. Following the extraction of deep face map features using the proposed VGG-19 method and the subsequent training of both the algorithm and a module that was learned on the IMAGENET dataset, transfer learning is used to train the algorithm on OSA facial pictures. "Deep Learning of Facial Depth Maps for Obstructive Sleep Apnea Prediction" using VGG-19 model lies at the intersection of the fields of sleep medicine and machine learning. This system aims to leverage the power of machine learning, specifically deep learning techniques, to predict obstructive sleep apnea using facial depth maps obtained through a non-invasive and low-cost imaging technique. The use of deep learning techniques can help to extract complex features and patterns from the facial depth maps, leading to a more accurate prediction of obstructive sleep apnea. Overall, the implementation lies at the intersection of sleep medicine and machine learning, leveraging the power of machine learning techniques to improve the diagnosis and treatment of obstructive sleep apnea.

No. of Pages : 14 No. of Claims : 4