(12) PATENT APPLICATION PUBLICATION   (21) Application No.202341052667 A

(19) INDIA

(22) Date of filing of Application :04/08/2023   (43) Publication Date : 01/09/2023

(54) Title of the invention : SYSTEM AND METHOD FOR AI BASED PREDICTIVE MAINTENANCE MODULE FOR GAS TURBINE ENGINE

(51) International classification : G06N0003040000, G06N0003080000, G05B0013020000, G06N0003020000, G06N0005000000
 	
(86) International Application No
    Filing Date : PCT// :01/01/1900
 	
(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)**Dr. T. Vishnu Vardhan**
	    Address of Applicant :#408, Padmavathi Homes, Quthbullapur road, Suchitra, Hyderabad-500067, India Hyderabad ----------- -----------
	  2)**Dr. A. Madhan Kumar**
	  3)**Mr. S. R. Kasthuri Raj**
	  4)**Mr. K. Narayanamoorthy**
	  5)**Mr. Muthuraman R K**
	  6)**Dr. A. Samuel Raja**
	  7)**Mr. R. Sunilkumar**
	  8)**Dr. B. Ramesh**
	Name of Applicant : NA
	Address of Applicant : NA
	(72)**Name of Inventor :**
	  1)**Dr. T. Vishnu Vardhan**
	Address of Applicant :#408, Padmavathi Homes, Quthbullapur road, Suchitra, Hyderabad-500067, India Hyderabad ----------- -----------
	  2)**Dr. A. Madhan Kumar**
	Address of Applicant :Assistant Professor, Department of Mechanical Engineering, Saveetha Engineering College (Autonomous), Saveetha Nagar, Thandalam, Chennai - 602105, Tamil Nadu, India Chennai ----------- -----------
	  3)**Mr. S. R. Kasthuri Raj**
	Address of Applicant :Assistant Professor, Department of Robotics and Automation, United Institute of Technology, Coimbatore - 641020, Tamil Nadu, India Coimbatore ----------- ----------
	  4)**Mr. K. Narayanamoorthy**
	Address of Applicant :Assistant Professor, Department of Mechanical Engineering, St. Joseph's Institute of Technology, OMR, Chennai – 600119, Tamil Nadu, India Chennai ----------- -----------
	  5)**Mr. Muthuraman R K**
	Address of Applicant :Assistant Professor, Aerospace Engineering, Periyar Maniammai Institute of Science and Technology, Vallam, Thanjavur, Tamil Nadu – 613403, India Thanjavur ----------- -----------
	  6)**Dr. A. Samuel Raja**
	Address of Applicant :Guest Faculty, Department of Automobile Engineering, Madras Institute of Technology, Chromepet, Chennai – 600044, Tamil Nadu, India Chennai ----------- -----------
	  7)**Mr. R. Sunilkumar**
	Address of Applicant :Assistant Professor, Department of Mechanical Engineering, United Institute of Technology, Coimbatore - 641020, Tamil Nadu, India Coimbatore ----------- ----------
	  8)**Dr. B. Ramesh**
	Address of Applicant :Dean Industry 4.0, Professor, Department of Mechanical Engineering, J.J. College of Engineering and Technology, Tiruchirappalli - 620009, Tamil Nadu, India Tiruchirappalli ----------- -----------

(57) Abstract :

Gas turbines age and sometimes have problems that may lead to a trip or failure event. This paper describe show one can reliably forecast such problems at a future date so that the problem can be dealt with in the present. These methods are data-driven by relying on machine learning to develop the mathematical description for the gas turbine. First, all instrumentation is combined in a state of the turbine that is forecasted into the future using a long short-term memory (LSTM) network. Second, this forecast is analyzed by a neural network trained to recognize normal healthy behavior in order to identify problem. Third, problem scan be diagnosed in some special circumstances by recognizing their fingerprint using past examples of the same failure mode; this is particularly relevant to vibration data.

No. of Pages : 16 No. of Claims : 6