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	(71)**Name of Applicant :**
	  1)Chitkara University
	   Address of Applicant :Chitkara University, Chandigarh-Patiala National Highway, Village Jhansla, Rajpura, Punjab - 140401, India. Patiala ----------- -----------
	  2)Chitkara Innovation Incubator Foundation
	Name of Applicant : NA
	Address of Applicant : NA
	(72)**Name of Inventor :**
	  1)CHAWLA, Muskan
	Address of Applicant :Research Scholar, Chitkara University Research and Innovation Network, Chitkara University Institute of Engineering and Technology, Chitkara University, Chandigarh-Patiala National Highway, Village Jhansla, Rajpura, Punjab - 140401, India. Patiala ----------- -----------
	  2)PANDA, Surya Narayan
	Address of Applicant :Professor, Chitkara University Research and Innovation Network, Chitkara University Institute of Engineering and Technology, Chitkara University, Chandigarh-Patiala National Highway, Village Jhansla, Rajpura, Punjab - 140401, India. Patiala ----------- -----------
	  3)KHULLAR, Vikas
	Address of Applicant :Associate Professor, Department of Computer Science and Engineering, Chitkara University Institute of Engineering and Technology, Chitkara University, Chandigarh-Patiala National Highway, Village Jhansla, Rajpura, Punjab - 140401, India. Patiala ----------- -----------
	  4)SINGH, Sunny
	Address of Applicant :Assistant Professor, Chitkara University Research and Innovation Network, Chitkara University Institute of Engineering and Technology, Chitkara University, Chandigarh-Patiala National Highway, Village Jhansla, Rajpura, Punjab - 140401, India. Patiala ----------- -----------
	  5)GOEL, Sonu
	Address of Applicant :Professor, Department of Public Health, PGIMER, Madhya Marg, Sector 12, Chandigarh - 160012, India. Chandigarh ----------- -----------

(57) Abstract :
The proposed system (100) introduces a federated learning framework, leveraging a distributed model architecture to facilitate collaborative model training across decentralized nodes (104) while prioritizing data privacy. Initially, a central server (102) disseminates pre-trained models to individual nodes (104), representing discrete users or devices. The nodes (104) engage in local model training processes utilizing their respective datasets, thereby capturing diverse insights from disparate data sources. Subsequently, federated averaging mechanisms aggregate model updates at the central server (102), iteratively refining a global model without necessitating raw data centralization. Through collaborative training across decentralized nodes, the system (100) generates a refined global model capable of accurately analyzing various aspects of verbal communication, including speech patterns, linguistic nuances, and emotional expressions. This enhanced understanding enables the system to provide valuable insights into verbal interactions, facilitating tasks such as speech recognition, sentiment analysis, and language comprehension.

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