

# Tanul Singh

## Experience

### Lead Machine Learning Engineer, LevelAI

AUGUST 2021 – PRESENT

#### LLM Based Autoscoring of Contact Center Agents (On-Going)

- Developed a transformative system using a fine-tuned Mixtral-7B model to evaluate contact center agents against a diverse set of rubrics, enhancing performance assessments across various domains and complex question types.
- Addressed complex evaluation challenges by developing a system capable of interpreting and scoring based on domain-specific and multi-step queries, such as assessing agent empathy and awareness of promotional offers. The model's advanced question-answering capabilities are crucial for integrating diverse and evolving customer rubrics efficiently.

#### Contextual Emotion Detection in Dialogue Systems

- Instruction Fine Tuned Deberta-v3 model with cloze-style prompts for dynamic emotion detection from customer utterances, achieving the capability to categorize utterances into seven distinct emotion classes (Angry, Disappointed, Annoyed, Disapproval, Happy, Gratitude, Admire).
- This technology greatly enhances the granularity and responsiveness of customer service interactions, facilitating more nuanced and empathetic engagements.

#### Detecting Customer's Concern and Resolution in Customer-Agent Interactions

- Spearheaded the development of a system designed to analyze and understand the core issues and resolutions within customer-agent interactions. This project enhanced the company's capability to provide superior service by accurately identifying and addressing customer needs.
- The back bone is a instruction Fine tuned a Flan-T5 base model which given a conversation generates the answer to the questions : "What was the primary concern of the customer?", "Did the agent resolve the customer Query?"

### NLP Engineer , JAVIS, Mumbai

JANUARY 2021 – AUGUST 2021

- Maintaining , Improving and expanding capabilities of Javis OMS(Order Management Stack) stack which is a language based smart ordering system based on contextual query-key matching.
- Helped in developing an algorithm which gives a fixed output (both on word and bounding box level) irrespective of the ocr system used(eg : AWS OCR, Azure OCR ,etc) which led to a saving of good scale

## Patents

### Dynamic Intent Detection in a Low Resource Setting [Patent Granted in American Patent Agency], LevelAI

JANUARY 2022 – DECEMBER 2022

- Innovated a dynamic intent detection system that can detect intents from customer utterances where the intents can be defined by giving 5-7 sample phrases .

## Details

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## Links

[LinkedIn](#)

[Kaggle](#)

[Github](#)

[ML Blogs](#)

## Skills

Python

Machine Learning

AI / ML / NLP

Pytorch

Computer Vision

MLOps

- This system adapts to real-time client modifications in the intent definition (removal/addition of example phrases , removal of intent as a whole ,etc) , surpassing traditional static models. This system, built on lightweight models, allows for rapid reconfiguration based on client inputs, enhancing flexibility and responsiveness in customer interactions.
- Our clients define Intents by giving 2-7 example phrases , these Intents are configurable in nature and clients can change the intent and respective phrases according to their needs
- The backbone is a Retrieve-Rerank Based solution using lightweight models (one bi-encoder and one cross encoder model) as a pseudo task to detect intents from customer utterances , this algorithm even beats GPT3.5 in best settings

## **AI Based Customer Satisfaction Score and Customer Effort Score Detection [Patent Granted in American Patent Agency], LevelAI**

OCTOBER 2023 – PRESENT

- Employed a sophisticated regression neural network that uses various hand crafted diverse features like sentiment score , emotion variations vector , resolution , User vector, answer to various questions like "Did the customer end on a gratitude?" , etc to produce Customer Satisfaction Scores (CSAT) and Customer Effort Scores (CES), enabling nuanced insights into service quality and customer engagement.
- This model has transformed operational efficiencies, significantly shortening the feedback loop and enabling proactive service adjustments. The system's accuracy and reliability in assessing agent performance and customer satisfaction have attracted high-profile clients like Uber, Affirm, and Toast, cementing LevelAI's reputation

## **Achievements**

### **Kaggle Days Championship Regionals - Winner**

AUGUST 2022

My Team won the Kaggle Days Championship Regionals to get a ticket to Barcelona, Spain for the finals of Kaggle days Championship where we will represent India .In the finals 36 teams from all over the world will fight for the World Champion Title

### **Kaggle Competition Master**

JULY 2021 – PRESENT

Kaggle Competitions Master (Ranked 250 among 160,272 Kagglers in the world , top 1 percent in Kaggle Competitions) with 3 gold , 10 silver medals . All in all I have participated in more than 30 competitions and have medals in 24 of them

### **Kaggle Notebooks Grandmaster**

MARCH 2021 – PRESENT

Kaggle Notebooks Master (Ranked 9 among 175,272 Kagglers in the world) with 16 gold medals . Every Notebook explores solutions to different problems of different verticals

## **Education**

### **Bachelor of Technology, Harcourt Butler Technical University, Kanpur**

JULY 2016 – JULY 2020

Graduated in Mechanical Engineering with Honours