# 3 Innovative Machine/ Deep Learning based ideas which have an excellent real-time use case.

**PROJECT TITLE:** Real-Time Emotion Recognition for Monitoring Mental Health

**A SHORT DESCRIPTION OF THE PROJECT:** The objective of this research is to create a system for real-time emotion recognition using machine/deep learning methods. To reliably identify and categorize the user's emotions, such as happiness, sadness, rage, and stress levels, the system will examine facial expressions, voice tones, and other physiological signs. Real-time monitoring of mental health and wellbeing is intended to be objective and unobtrusive.

**INPUT OF THE PROJECT:** Real-time audio and video data capturing the user's facial expressions, voice, and physiological signals (e.g., heart rate, skin conductance).

**OUTPUT OF THE PROJECT**: The system will provide real-time emotion recognition and classification results, indicating the user's current emotional state and stress levels.

**USE CASE OF THE PROJECT:** Numerous real-time applications of this study are possible, including workplace stress assessment, personalized treatment sessions, mental health monitoring in clinical settings, emotional wellbeing tracking in different situations including gaming, virtual reality, and human-computer interaction.

**PROJECT TITLE:** Waste Management System with Intelligence

**A SHORT DESCRIPTION OF THE PROJECT:** The project's goal is to use machine learning and deep learning to create an intelligent trash management system. The system will use sensor data and computer vision to monitor waste levels in trash cans and to continuously improve rubbish pickup routes. The system will aid in optimizing waste collection operations, cutting expenses, and promoting a more sustainable waste management process by precisely forecasting when and where bins will fill to capacity.

**INPUT OF THE PROJECT:** Garbage bin locations can be determined using geolocation data, sensor data measuring waste levels, and visual data from cameras put nearby.

**OUTPUT OF THE PROJECT:** Optimized waste collection routes, real-time monitoring of waste levels, and notifications/alerts for waste collection staff.

**USE CASE OF THE PROJECT:** This project can significantly improve waste management efficiency in smart cities, reducing fuel consumption and traffic congestion caused by inefficient waste collection routes. It can also help prevent overflowing bins and maintain cleaner environments by ensuring timely waste collection and reducing the likelihood of littering.

**PROJECT TITLE:** Personal Assistant for Fashion Styling

**A SHORT DESCRIPTION OF THE PROJECT:** A personalized fashion styling assistant will be created as part of this project utilizing machine/deep learning methods. To offer real-time fashion advice and style suggestions, the system will analyze user preferences, body measurements, and existing wardrobe items. The assistant will assist users in coming up with fashionable ensembles depending on their unique likes, body types, and occasions by utilizing image analysis and fashion trends.

**INPUT OF THE PROJECT:** User preferences, body measurements, photos of the user's current outfit, and environmental data (such as the weather and type of event).

**OUTPUT OF THE PROJECT:** Personalized outfit ideas, styling tips, and real-time fashion guidance.

**USE CASE OF THE PROJECT:** This project has applications in smart mirrors, fashion e-commerce platforms, virtual try-on software, and online shopping. Users will be able to choose outfits with less fuss, make better fashion decisions, and generally look and feel better. Additionally, by encouraging consumers to creatively use the clothing in their wardrobes rather of continuously purchasing new outfits, it can support sustainable fashion.

References:

1) U. M. R, S. V. Vasantha, S. K. R. G and A. Md, "Emotion Detection using Facial Image for Behavioral Analysis," 2022 International Conference on Futuristic Technologies (INCOFT), Belgaum, India, 2022, pp. 1-7, doi: 10.1109/INCOFT55651.2022.10094501.

1) J. Cheng, Y. Deng, H. Meng and Z. Wang, "A facial expression based continuous emotional state monitoring system with GPU acceleration," 2013 10th IEEE International Conference and Workshops on Automatic Face and Gesture Recognition (FG), Shanghai, China, 2013, pp. 1-6, doi: 10.1109/FG.2013.6553811.

2)T. H. Ali, M. A. Akhund, N. A. Memon, A. H. Memon, H. U. Imad and S. H. Khahro, "Application of Artifical Intelligence in Construction Waste Management," 2019 8th International Conference on Industrial Technology and Management (ICITM), Cambridge, UK, 2019, pp. 50-55, doi: 10.1109/ICITM.2019.8710680.

2) T. Ahmed Chowdhury, N. Jahan Sinthiya, S. M. Sajid Hasan Shanta, M. Tasbiul Hasan, M. Habib and R. M. Rahman, "Object Detection Based Management System of Solid Waste Using Artificial Intelligence Techniques," 2022 IEEE 13th Annual Ubiquitous Computing, Electronics & Mobile Communication Conference (UEMCON), New York, NY, NY, USA, 2022, pp. 0019-0023, doi: 10.1109/UEMCON54665.2022.9965643.

3) Ching-I Cheng and Damon Shing-Min Liu, "An intelligent clothes search system based on fashion styles," 2008 International Conference on Machine Learning and Cybernetics, Kunming, China, 2008, pp. 1592-1597, doi: 10.1109/ICMLC.2008.4620660.

# Bonus Points project ideas

**PROJECT TITLE:** System for Processing Documents Intelligently

**DOMAIN:** Cloud Computing

**A SHORT DESCRIPTION OF THE PROJECT:** The goal of this project is to create a smart document processing system that makes use of cloud computing capabilities. The system will automate the extraction, classification, and analysis of information from various types of documents, such as invoices, contracts, and forms, using machine learning algorithms and natural language processing techniques. It can effectively handle massive volumes of data, increase accuracy, and provide seamless connectivity with other corporate applications by processing documents in the cloud.

**INPUT OF THE PROJECT:** Documents in various digital or scanned formats.

**OUTPUT OF THE PROJECT:** Document classification, data from documents that have been extracted and structured, and pertinent insights.

**USE CASE OF THE PROJECT:** This initiative can help sectors like banking, law, and administration where document processing takes a long time and is prone to mistakes. It may automate the handling of invoices, contracts, and forms, which saves time, boosts productivity, and ensures data accuracy. Additionally, the system is able to interface with current business workflows and systems, giving important insights from papers that have been processed.

**PROJECT TITLE:** Platform for Real-Time Collaborative Coding

**DOMAIN:** Development across the board

**A SHORT DESCRIPTION OF THE PROJECT:** The goal of this project is to create a real-time, developer-collaborative coding environment. The platform will offer a dynamic environment for coding where several users can work together at once on the same codebase. It will enable developers to collaborate effectively no matter where they are physically by supporting features like real-time code synchronization, team debugging, and chat-based collaboration.

**INPUT OF THE PROJECT:** Real-time user interactions, code files, and user authentication.

**OUTPUT OF THE PROJECT:** A platform for real-time, collaborative coding that allows for synchronized code changes, real-time communication, and debugging.

**USE CASE OF THE PROJECT:** Distributed development teams, open-source communities, and platforms for programming instruction can all benefit from this effort. It enables seamless developer collaboration, knowledge sharing, and real-time project collaboration. It encourages global developers to work remotely together, share information, and take advantage of educational opportunities, which boosts output and code quality.