# Methodology:

1. Data Collection: Collect a large dataset of images of different types of solid waste, labelled according to their recyclability, material type (plastic, paper, etc.), and any other relevant information.
2. Data Pre-processing: Pre-process the data by resizing images, normalizing pixel values, and augmenting the dataset to increase its size and diversity.
3. Model Selection: Select a suitable deep learning model architecture for the classification task, such as Convolutional Neural Networks (CNNs) or Transfer Learning models.
4. Training: Train the model on the pre-processed dataset, using an appropriate loss function, optimizer, and hyperparameters.
5. Evaluation: Evaluate the model's performance on a held-out validation set, using metrics such as accuracy, precision, recall, and F1 score.
6. Fine-tuning: Fine-tune the model by adjusting the hyperparameters, architecture, or training data, based on the evaluation results.
7. Deployment: Deploy the trained model in a smart waste management system, either on a cloud-based server or on a local device, to classify incoming images of solid waste in real-time.
8. User Feedback: Collect user feedback on the system's performance and incorporate it into the model training and fine-tuning process to improve its accuracy and efficiency.
9. Maintenance: Regularly maintain and update the system by retraining the model on new data, improving the image processing pipeline, and keeping the hardware and software up-to-date.