Source Code Details:

**Frontend Implementation Using React.js**  
  
The frontend of the waste management application is developed using React.js, ensuring a responsive and interactive user experience. The implementation includes components for user registration, waste reporting, and real-time tracking.

*Key Code Snippets:*

* User authentication using Firebase.
* Image upload and preview functionality.
* Integration with Google Maps API for location tracking.

**Backend Development Using Node.js and Express.js**

The backend is implemented using Node.js and Express.js, providing a RESTful API for data handling. It includes endpoints for user authentication, waste report submission, and task assignment.

*Key Code Snippets:*

* JWT-based authentication.
* Database interaction using MongoDB.
* Asynchronous request handling with Promises and async/await.

**Database Design and Optimization Using MongoDB/MySQL**  
  
This paper details the database schema design, which optimizes waste management operations. The system stores user details, reports, geotagged data, and task assignments.

*Code Details:*

* Schema design for waste reports.
* Indexing techniques to improve query performance.
* Data aggregation pipelines for analytics.

**Integration of Machine Learning for Waste Classification**  
  
The system integrates a deep learning model for waste classification. The model is trained using TensorFlow and deployed via a Flask API.

*Implementation Steps:*

1. Train a CNN model on labeled waste images.
2. Export the model and deploy it using Flask.
3. Connect the model with the application’s backend.
4. Classify waste images uploaded by users.
5. Return classification results to the frontend.

**Implementation of Notification System Using Firebase Cloud Messaging (FCM)**  
  
A real-time notification system is integrated to keep users informed about waste clearance status. Firebase Cloud Messaging (FCM) enables push notifications to mobile devices.

*Code Details:*

* Setting up FCM with Firebase.
* Sending notifications using the Firebase API.
* Handling notifications on the frontend using React.

These papers provide both algorithmic insights and source code implementation details essential for your Domestic Waste Management project.