Project Name: Chitti - Remote Robot Management

Team Name: Dread Fuel

Development Environment Setup Guide

This guide provides step-by-step instructions for setting up the development environment for the Remote Robot Management Cloud System. Follow these steps to install required software, configure dependencies, and run the codebase locally.

Prerequisites

- **Operating System:** Windows, macOS, or Linux
- **Node.js:** v16 or later (for Firebase CLI)
- **Python:** 3.7 or later (for robot client)
- **Git:** Latest version (for version control)
- **Google Cloud/Firebase account**

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1. Clone the Repository

```
git clone <your-repo-url>
cd <project-directory>
```

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2. Install Node.js and npm

- Download and install Node.js from nodejs.org (https://nodejs.org/)
- Verify installation:

```
node -v
npm -v
```

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3. Install Firebase CLI

```
npm install -g firebase-tools
```

- Verify installation:

```
firebase --version
```

4. Set Up Firebase Project

1. Log in to Firebase:

```
firebase login
```

2. Initialize Firebase in the project directory:

```
firebase init
```

- Select **Hosting** and follow prompts
- Use `public` as the public directory
- Configure as a single-page app if prompted

3. Add your Firebase project configuration to `firebase.json` and `.firebaserc` as needed.

5. Install Python and Dependencies (Robot Client)

- Download and install Python from python.org (https://www.python.org/)
- Install required packages:

```
pip install firebase-admin
```

6. Configure Service Account (Robot Client)

1. In the Firebase Console, go to **Project Settings > Service Accounts**
2. Generate a new private key and download `serviceAccountKey.json`
3. Place `serviceAccountKey.json` in the project root (do NOT commit this file)

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7. Running the Codebase Locally

Run the Web App (Frontend)

```
firebase serve
```

- Visit [http://localhost:5000 (http://localhost:5000)](http://localhost:5000) in your browser

Run the Robot Client (Simulated)

```
python robot_firebase_client.py
```

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8. Troubleshooting & Common Issues

Firebase CLI Not Recognized

- Ensure Node.js and npm are installed and in your PATH
- Reinstall Firebase CLI: `npm install -g firebase-tools`

Permission Denied or Port in Use

- Make sure no other process is using port 5000
- Run terminal/command prompt as administrator

Service Account Errors

- Ensure `serviceAccountKey.json` is present and not corrupted
- File permissions should allow read access

Python Import Errors

- Run `pip install firebase-admin` again
- Ensure you are using the correct Python version (`python --version`)

Firestore Rules or Authentication Issues

- Check your Firebase project settings and security rules
- Make sure your user account has the correct permissions

IP Lockout During Login

- If your IP changes, you may be unable to log in. Contact an admin or update your registered IP in Firestore.

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9. Additional Resources

- Firebase Documentation (https://firebase.google.com/docs)
- Python Firebase Admin SDK (https://firebase.google.com/docs/admin/setup)
- Node.js Downloads (https://nodejs.org/)
- Python Downloads (https://www.python.org/downloads/)

For further assistance, contact the Engineering department or your project lead.