

RFiD Time Tracker

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Introduction

RFID Time Tracker is a website tool to help you track and overview your work hours in the RoboTeam.

Tracked hours will be used to calculate how much compensation you receive from FOBOS, so be sure to check in!

Features

1. Registering a physical NFC tag to check in/out physically at the office.
2. check in/out remotely if you forgot to do in real life.
3. setting up your weekly hour quota
4. Viewing your statistics compared to a weekly/monthly progress bar. Total for today/week/month...
5. For admins - viewing different team member's stats, viewing team's statistics in bar charts with members comparison.

It works in combination with physical box mounted onto the wall, created by RoboTeam members. It is advised to track your working hours for convenience.

Tech overview

The RFID Tracker consists of two parts: a physical box to scan your RFID tag, and a web dashboard to see your statistics.

Web dashboard

codename midas, it as a **Django** application. Unlike the landing page project, this one uses `nix` to manage system dependencies and `uv` to manage Python packages.

Its source code lives at <https://github.com/RoboTeamTwente/rfid-tracker-server>.

RFID scanner

Its source code lives at <https://github.com/RoboTeamTwente/RFID-Time-Tracker-Scanner>.

Web app

Web app

Getting Started

Tech Stack

- **Language:** Python 3.14 (Managed via Nix)
- **Framework:** Django
- **Package Manager:** [uv](#) (Fastest Python resolver/installer)
- **Environment:** [Nix](#) (with the `std` library)
- **Command Runner:** `just` (alternative to `make`)

Setting Up the Environment

FIXME: this is wrong

You do not need to install Python or Django manually. You only need **Nix**.

Step 1: Install Nix

If you don't have it, install Nix and enable “experimental features” (Flakes and Nix Command).

Consider doing the latter like that:

1) `sudo mkdir /root/.config/nix`

2) `sudoedit /root/.config/nix/nix.conf`

3) In there, add this line `experimental-features = nix-command flakes`

Step 2: Enter the Development Shell

Navigate to the project root and run:

```
nix develop
```

What happens when you run this? Nix reads `shells.nix` and `packages.nix` to:

1. Download and provide **Python 3.14**.
2. Install system tools like `curl`, `git`, `uv`, and `just`.

3. Set up your `PATH` to include the project's virtual environment (`.venv/bin`).
4. Activate a custom shell prompt (the "embed console").

Step 3: The "Just" Command Runner

Once inside the Nix shell, we use a tool called `just` to run common tasks.

Command	Action
<code>just</code>	Lists all available commands.
<code>just init-db</code>	Run this first. It migrates the DB and asks you to create a Superuser.
<code>just dev</code>	Starts the Django development server.
<code>just make-migrations</code>	Generates new DB migration files after model changes.
<code>just fmt</code>	Automatically formats all code using <code>treefmt</code> .
<code>just test</code>	Runs the Django test suite.

Step 4: Running the dev server

Consider using these commands after all previous steps:

`nix init-db` creates and initializes the DB, prompting for superuser credentials.

`nix dev` starts a local dev server.

Congratulations! You are ready to develop.

Structure of the project

Architecture & Frontend Patterns (Midas)

The RFID Tracker (codename **Midas**) follows a traditional Django structure but uses a “Single File Component” philosophy for its views.

Project Organization

The project is split into the core configuration and the functional app logic.

Directory / File	Role
<code>midas/</code>	The active module containing the latest logic, models, and views.
<code>webui/</code>	Legacy code kept for bookkeeping; do not use for new features.
<code>templates/midas/</code>	The “Face” of the app. Contains HTML layouts, CSS, and JS.
<code>models.py</code>	Database schema (RFID tags, teams, hours).
<code>views.py</code>	The “Controller.” Fetches data from DB and performs calculations.
<code>urls.py</code>	Maps URLs to specific Python functions in <code>views.py</code> .

The Frontend Pattern

Layout Strategy

Every page follows this block-based hierarchy:

- `{% extends 'midas/base.html' %}`: Inherits the sidebar, navbar, and global styles.
- `{% block head %}`: Contains page-specific CSS and external libraries (like Chart.js).
- `{% block main %}`: The actual HTML content (cards, forms, tables).

4. `<script>`: Local logic for charts or UI interactions.

The “Data Bridge” (Python to JavaScript)

To keep the code clean and secure, we use a specific pattern to pass data from the Python backend to the JavaScript frontend.

The `json_script` Filter

Instead of messy string concatenation, we use Django's `json_script` tag. This safely injects Python dictionaries into the HTML as a JSON object that JS can read.

In the HTML Template:

```
{{ page_data|json_script:"frontend-data" }}
```

In the JavaScript block:

```
const appData = JSON.parse(document.getElementById('frontend-data').textContent);  
// Now appData.chart.labels is ready for Chart.js!
```

Backend Logic & Calculation

The heavy lifting is done in the Python files before the page even loads:

- **Calculations:** Logic like “Total Hours” or “Avg per Member” is calculated in `views.py` or helper files like `statistics.py`.
- **Database Interaction:** Uses Django’s ORM (Object-Relational Mapper) to query the `db.sqlite3` (dev) or the production DB.
- **Forms:** Django’s `forms.py` handles input validation when you change dates or teams in the dashboard.

Admin dashboard

Django provides its own built-in admin dashboard which can be reached through “Admin Dashboard” button on the sidebar. (if you are a superuser).

RFID Scanner