MÓDULO PROYECTO

CFGS Desarrollo de Aplicaciones WEB
Informática y Comunicaciones

MOTORLAND

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Tabla de contenido

1 Identificación proyecto

The project I have decided to undertake as my Final Degree Project (TFG) for my higher degree in DAW (Web Application Development), is a social network (in its web version) specialized in the automotive world. Users will be able to register and earn points by receiving positive feedback from other users (both on their profile and their posts). Once they reach a certain amount, they will be able to create their own events.

2 Organización de la memoria

The memory has been organized following the outline provided by the center's professors.

3 Descripción general del proyecto

The project is the development of the basic functionalities of a specialized social network for motor enthusiasts. It must include both the option to create publications and to create events with all the logic that this entails.

3.1 Objetivos

The ultimate goal is to develop a web application that allows the complete organization of meetups so that motor enthusiasts can gather in one place to enjoy what they love, always following the relevant rules and knowing that they must adhere to regulations.

The creation of events as well as the subscription/registration to them will be controlled by a scoring system (Stars) that will be responsible for deciding if a person can register or create events. This will be done to prevent everyone from registering without a filter and to try to maintain an environment with the least possible toxicity.

It is also intended to implement a multilingual system with the aim that the application is accessible to as many people as possible, and an insult control system to avoid toxicity at the highest possible level. Regarding the styles section, the aim is to achieve modern styles that maintain the essence of other social networks, in order to facilitate adaptation for users and prevent the leap to using this platform from being an access barrier for people who are not accustomed to constant technology use.

3.2 Cuestiones metodológicas

Regarding methodological issues, the project will be carried out in the common way I have seen in my internship environment: the simultaneous construction of the back-end and the front-end. This allows us to achieve the greatest possible adaptability and is the method used in the internships, so it is the one I am most familiar with.

3.3 Entorno de trabajo (tecnologías de desarrollo y herramientas)

The development environment has been entirely Visual Studio Code, and the technologies used have been MySQL for the database, native PHP for database connections, and HTML, TS, and CSS on the Angular framework for the complete front-end. The decision to use this framework is

because we saw it during the course and I feel comfortable with it. Furthermore, the fact that there is not as much documentation as for others seemed like a challenge I wanted to take on. In addition to these technologies, the Leaflet API (for managing event addresses and displaying functional maps) and the Nominatim Rest API (to translate both coordinates to addresses and addresses to coordinates and thus display them on the map) have been used.

4 Descripción general del producto

4.1 Visión general del sistema: límites del sistema, funcionalidades básicas, usuarios y/o otros sistemas con los que pueda interactuar.

The current limits of the system are established by the server where it is deployed and the need to have a constant internet connection for it to function, since all information is sent from the server. Both photos and the rest of the code, including texts, are received from the server. The basic functionalities implemented are: a publications/posts system (with likes/dislikes, the option to delete or edit, and a comment system with the option to edit), an events system (with a score requirement to register, an editing system, as well as cancellation or deletion, a dynamic status system by date, its own comment system, a likes/dislikes system closed to registered users and only once the event has started, a list of registered users for the creator to control access and/or remove potential scammers), a user's own scoring system (users can earn points by receiving likes or positive feedback from a user, but they must be careful as they also run the risk of losing it if the interaction is negative (the score received will vary depending on where the interaction is)). Some of the highlighted functionalities of the application are the password encryption system using the AES-GCM 256-bit algorithm, and using an encryption key that is itself encrypted using SHA-256.

4.2 Descripción breve de métodos, técnicas o arquitecturas(m/t/a) utilizadas.

The main methodology implemented in this project is structured programming (the main reason for this is that it is what we worked with at the company), although it is also partially event-driven because the framework used "Angular" is a partially event-driven framework (for example, click attributes or EventEmitters would be two clear examples of Angular's event-driven orientation).

4.3 Despliegue de la aplicación indicando plataforma tecnológica, instalación de la aplicación y puesta en marcha

For deployment, the best option I have found for an affordable price would be InterServer, which would cost us around €100 annually with a capacity of 1000 daily connected users, which for a small, newly deployed application seems fair to me. We would obtain the domain from Namecheap/GoDaddy and it could cost from €10 annually, which seems affordable to me, while the SSL certificate, to provide security, we would obtain for free from Let's Encrypt. The decision to use these services has been made taking into account their price and needs, since the basic InterServer plan is sufficient for the initial stages (it has 2GB of RAM which is more than enough for what we need), and on the other hand, the free SSL certificate is not the same as a paid one, but it provides an adequate level of security.

5 Planificación y presupuesto

The application construction process began with the idea. Once this was developed and approved, the back-end and front-end implementation began simultaneously (this is the format we worked with during the internships). The budget in this case has been zero because the application has been developed entirely by me and all the means used have been free "section 4.3 details the potential cost of a hypothetical deployment".

6 Documentación Técnica: análisis, diseño, implementación y pruebas.

6.1 Especificación de requisitos

The main requirements I had to take into account when carrying out this project were that it had to be able to manage users with everything that this entails: encrypted passwords, requirements with RegEx, and following and blocking between users. For post management, it must be able to manage comments, hashtags, likes. For Events, it must be the same, but additionally, it must be able to manage registrations and statuses. Finally, it must be able to manage hashtags (which are added to the corresponding table without duplicates).

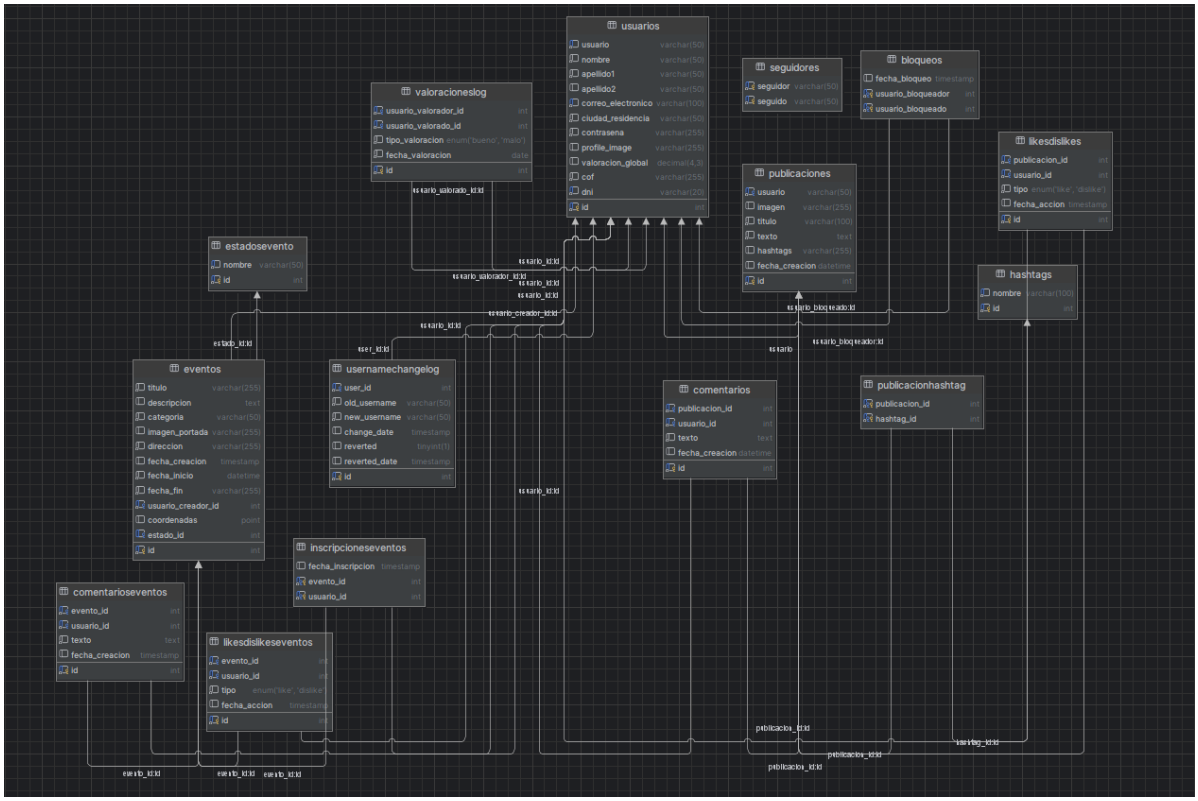
6.2 Análisis del sistema

The application is a social network focused on the automotive world, allowing people to organize meetups (selecting the location and keeping a list of participants). The system is capable of carrying out all the necessary management to provide users with the simplest possible experience. In addition to events, the application has a post system and a user control system (Following and Blocking) and a dynamic scoring system that allows us to select users who can join events based on their score (this ensures that only active users who the community considers good can register or create these events).

6.3 Diseño del sistema:

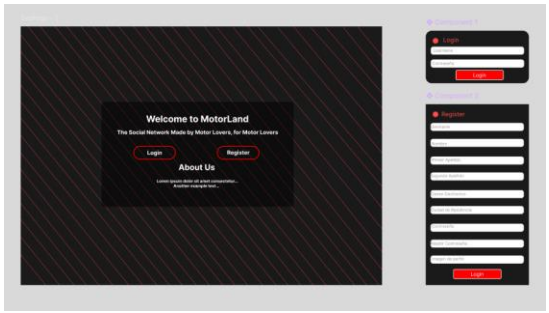
6.3.1 Diseño de la Base de Datos

La base de datos es una base de datos de tipo relacional picada sobre MySQL mediante el gestor de bases de datos de MySQL Worbench

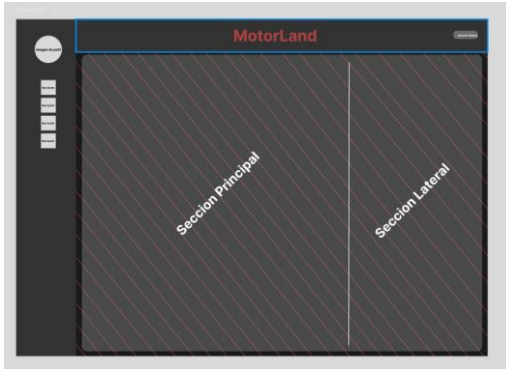


6.3.2 Diseño de la Interfaz de usuario.

Arrival Tab Design (Login and Register)



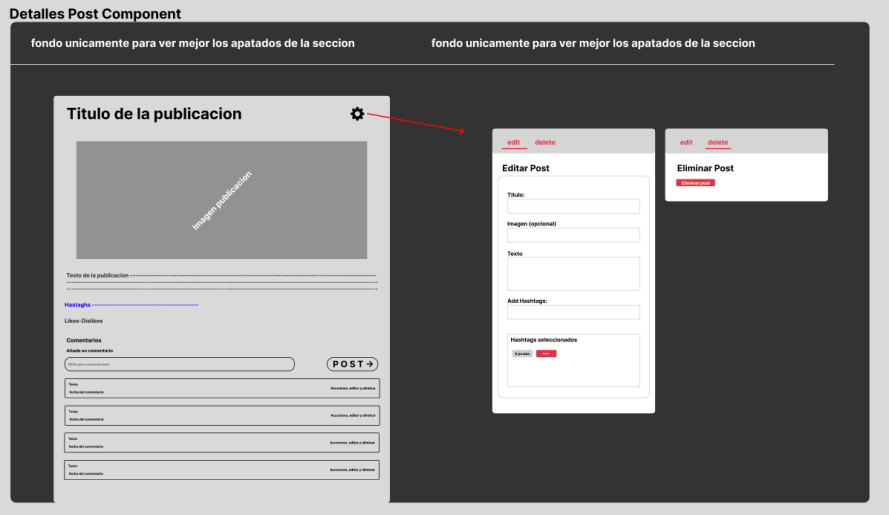
Main section of the page, content will be loaded here using Angular's router outlets.



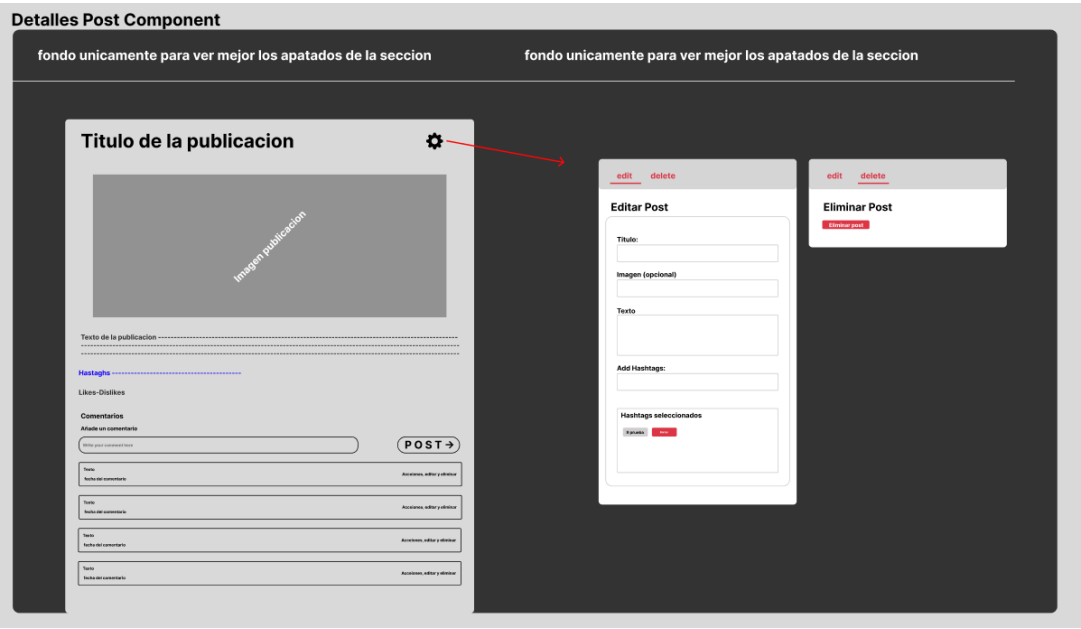
Lateral Secction Content

posts Component

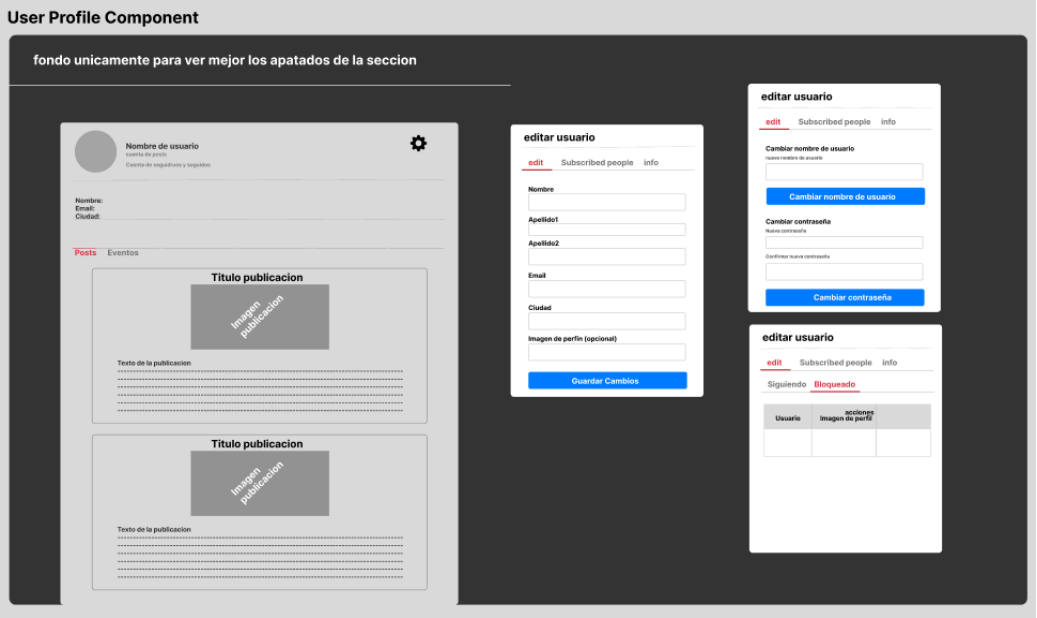
Post details component



Event Details (the list will be very similar to the posts list)



User Window (the window will have two versions but will be very similar)



6.3.3 Diseño de la Aplicación.

6.4 Implementación:

6.4.1 Entorno de desarrollo.

The development environment used to carry out the entire project has been Visual Studio Code, along with its corresponding plugins. The decision I made for this is that it is the platform I am most comfortable with. npm has also been used for Angular installation.

6.4.2 Estructura del código.

The code is divided into two main blocks: the Front End, developed entirely on Angular and consuming external resources such as Leaflet and Nominatim, and the Backend, which is completely developed on PHP, specifically its version 8.2.12. Although it is not the latest existing version, it is one of the most modern, so I had to update my knowledge of this language because both in class and in the internships, we mainly worked with older versions.

6.4.3 Cuestiones de diseño e implementación reseñables.

The two most noteworthy points of the entire system from my point of view are: - The password encryption system that uses AES-GCM, currently one of the most secure systems on the market, especially standing out over SHA-256, which is one of the most used methods for storing passwords despite not being an encryption algorithm but a cryptographic hash algorithm, therefore not nearly as secure as the aforementioned AES-GCM. - Additionally, in the posts section, an infinite scroll system has been implemented (to prevent system overload, only a certain number of posts are

loaded at a time, for example, 10 at a time, and when the user scrolls and reaches a certain point, a new request is made and more posts are displayed).

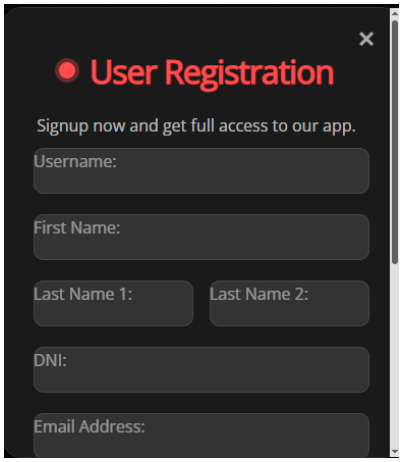
6.5 Pruebas.

To test the code, the decision was made to use the application by simulating the most realistic environment possible, thus seeking to find possible hidden errors that are not revealed in the code. The most notable errors found during these tests were an error in the encryption and management of passwords and an error in the handling of long texts when displaying them on the screen, two errors that have already been completely corrected.

7 Manuales de usuario

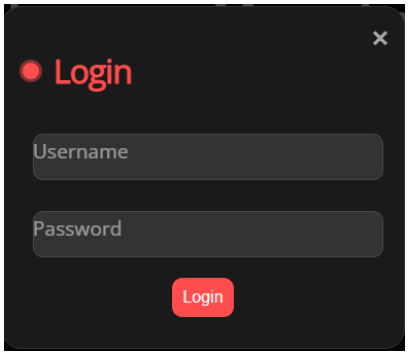
7.1 Manual de usuario

When a new user arrives at the application, the first thing they will have to do is register in the corresponding modal (they must click on the register button).

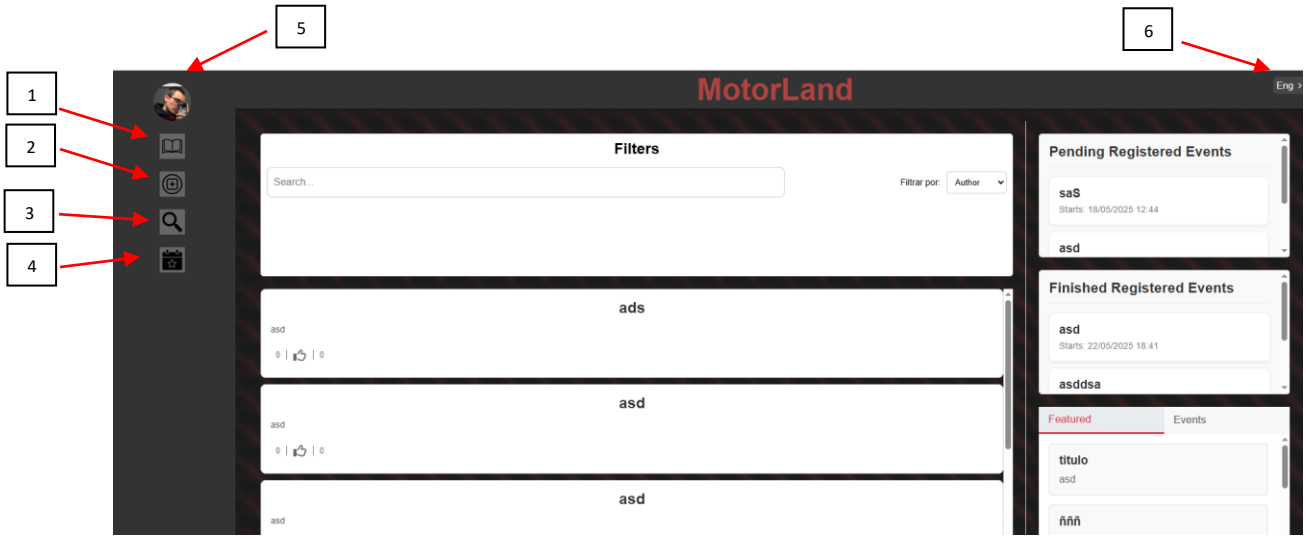


The registration conditions are that the username must be unique, the email address valid and unique, as well as the ID (DNI) which must be correct and have all the digits and the letter. In addition, the password must meet the requirements of having one uppercase letter, one lowercase letter, one number, one special character, and be 8 characters long.

Once the user has registered, they will have to log in, using the button that appears when clicking the login button.



After logging in, the user will be redirected to the most common page of the entire web application, the posts viewer.

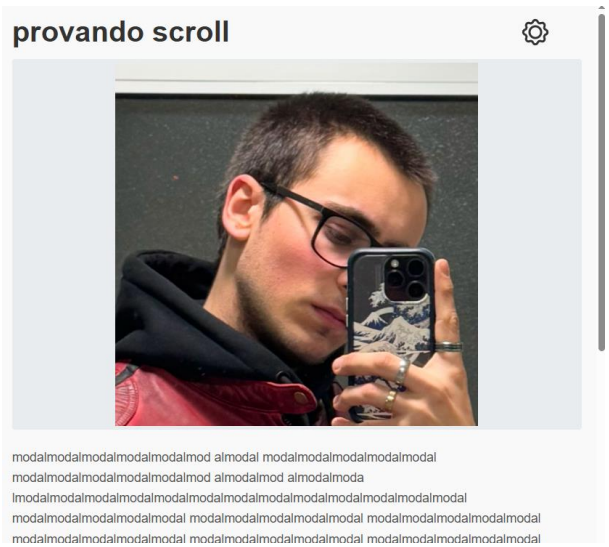


Now we can enter to the rest of options

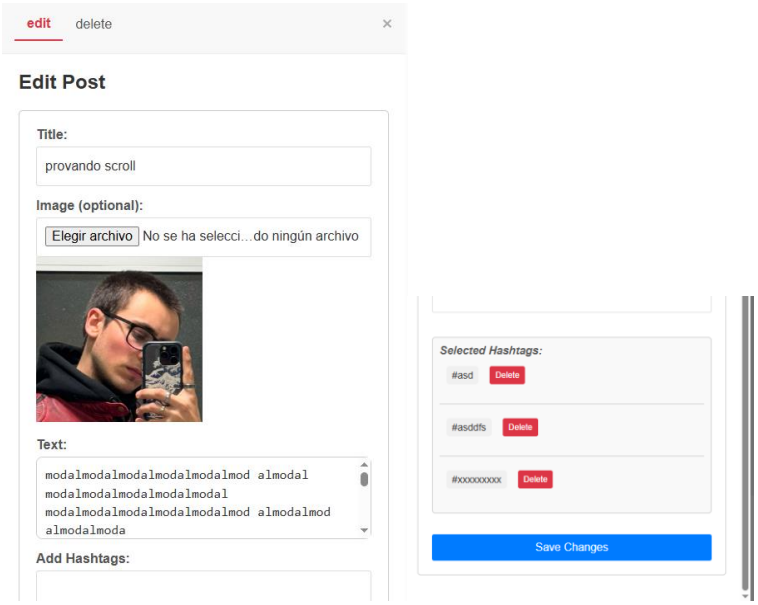
1-Posts

This is the section where the user can see the publications made by other people or by themselves. The basic information of each publication is shown because by clicking on one of them, we can access its interior and see all its information.

This is the upper part of the post details screen.

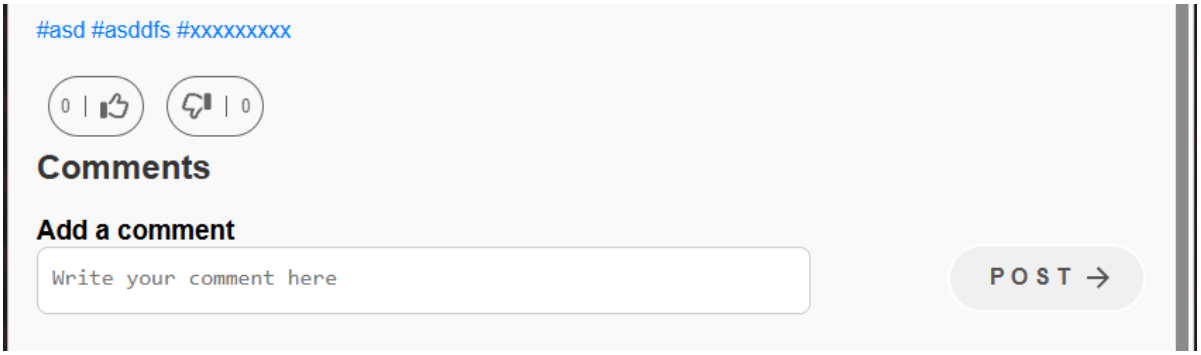


From here, the user can see the title, the image, and the description of the publication. In addition, if they are the creator, they can see the gear icon in the upper right that allows them to make modifications to the post in the following modal.



On this first screen of the modal, we can make changes to the details of our post, while on the second, we can permanently delete the publication.

At the bottom of the post screen, the user will have access to the following controls.

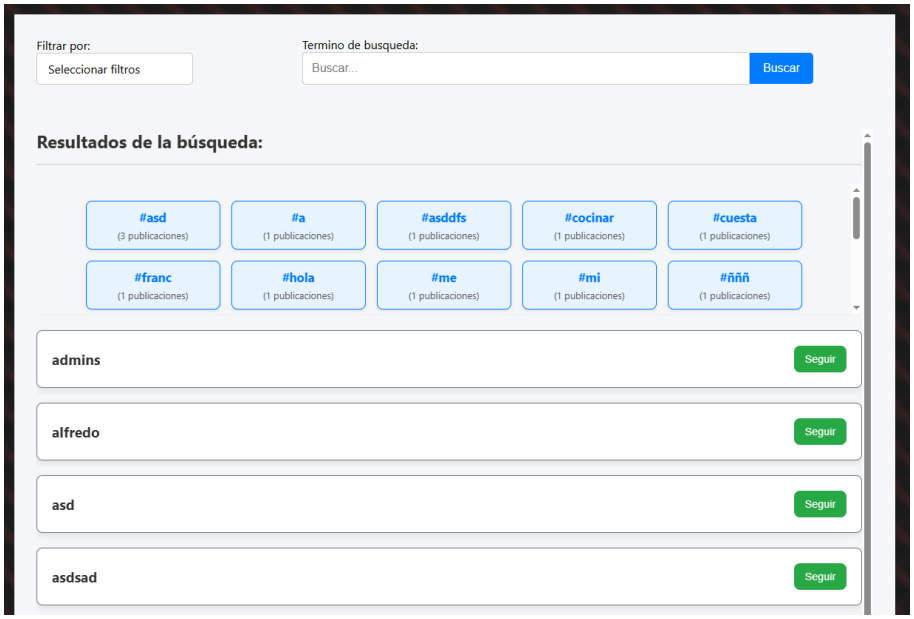


You can see the hashtags of a publication, the likes it has, as well as like or dislike (we have to keep in mind that this helps improve a user's score). In addition, we can add comments which we can later edit or delete as long as we are the creating users.

2- Post creation modal

By clicking this button, this modal will be shown, which will allow us to create a publication. We have to keep in mind that the only mandatory fields are the title and the text. To add hashtags, we have to write them and press enter one by one, and the image allows us to select it from the folder we prefer on our computer.

3-Search Panel



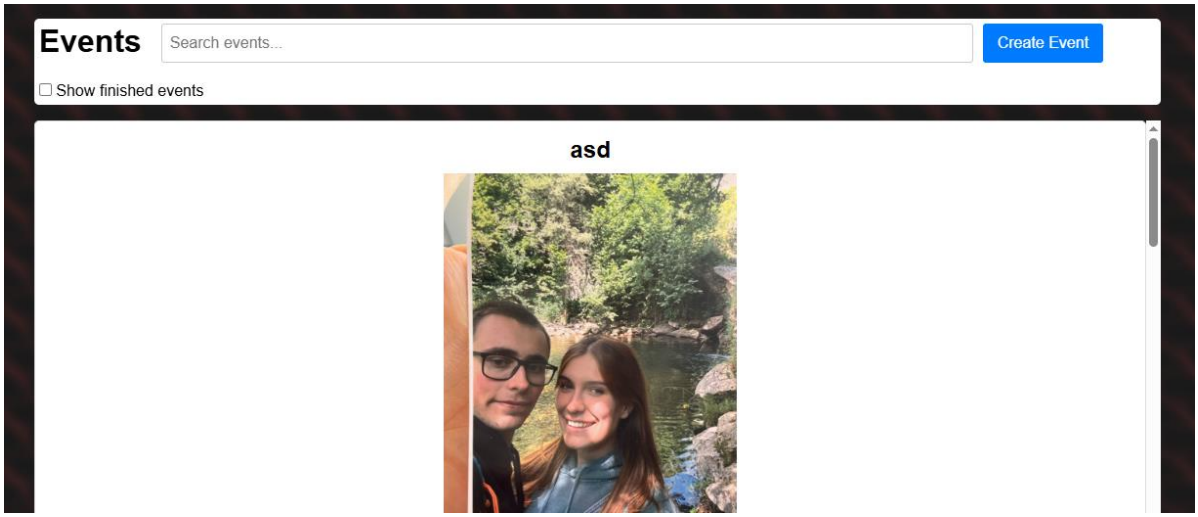
In this section, both users and hashtags can be searched. If you click on a user, you will be redirected to their profile, while if you click on a hashtag, you will be redirected to the following screen where you can see all the posts that have that hashtag linked.

If you click on one of the posts, you will be redirected to the large view of that same post.

If you click on one of the users instead, you will be redirected to their profile tab, which is very similar to the user profile screen but without access to the post/event management options.

4- Events

This is the main section from which to search for events, whether finished or active/to start.

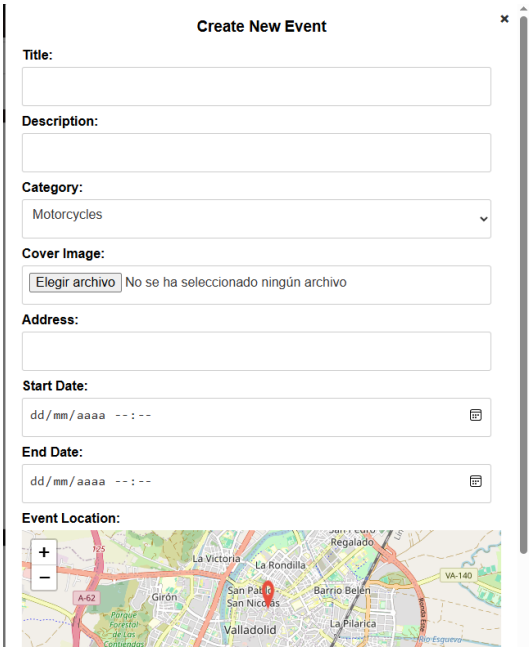


We have 3 sections at the top: an input that allows us to search for events by typing and it will search in their content, a button which, if clicked, will show us finished events, and a button we can click to show the event creation modal.

This is the event creation modal. In it, we will have to enter a title and a description, as well as select a category. Optionally, we can add an image or not.

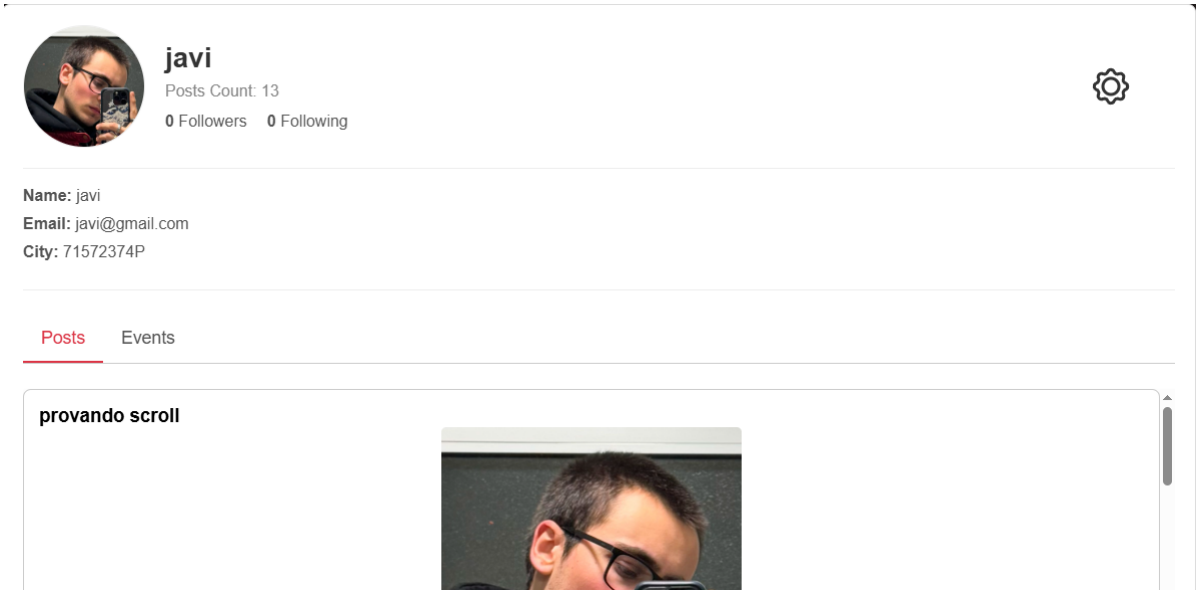
We will have to select an address. We can do this either by typing it or by searching for it on the map and dragging the pointer over it.

Finally, we will have to add two dates: the start date, which must be at least 24 hours after the time we are creating the event, and an end date, which must be after the start date of the event.



5-User Profile

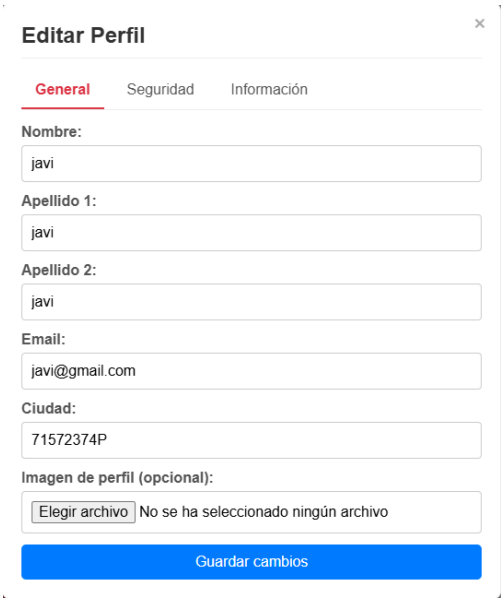
Only the user can access this section. It is the private window with profile data. Other users can access a very similar page from the search section, but with some fewer functionalities.



In this window, the user can see the number of publications they have made, the number of followers and following, as well as general data at the top. Below, there are two selectors that

allow them to switch between posts and events, and depending on the one they select, their posts or their events will be displayed.

At the top, there is a button in the shape of a cogwheel / or gear, from which you can access the user management modal where you can change your data using the following modal:



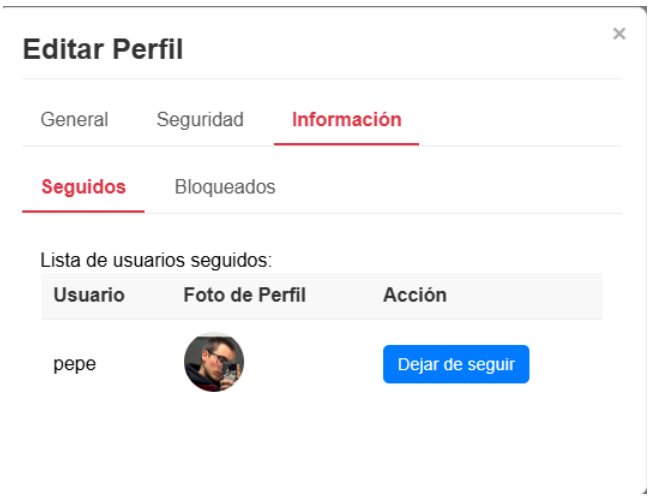
This is the modal for editing our user data. We will only have access to the modal from which we can modify our own data. In the first section, we will be allowed to modify the basic user information. In the second section, we can modify the username or password. Be careful because username modifications follow certain rules:

1- The username must be available.

2- 2- If we change our username, we can recover the old one for 30 days as a reservation in case we changed it by mistake (if we change the name incorrectly, to change it again, we will have to recover the previous name

previous and then change it to the one we want).

The third option will allow us to see the list of followed and blocked users we currently have, as well as give us the option to unfollow or unblock respectively.



6- Language Selector

This is the selector that allows us to choose the display language of our app. We just have to click on the one we want and it will change automatically.

7.2 Manual de instalación

When deploying this application, we will have to take several things into account. The first is that in Angular, there are two types of deployment. The first is deployment in development mode, for which the only thing we have to do is download the repository having npm installed and execute the following command:

```
C:\xampp\htdocs\angular\tfgdefinitivo\Motorlan-tfgJavierRodriguez->npm install
```

The second step will be to move the `dataTFG` folder that we will find in `public` and move it to the root of our PHP server, for example Apache. We will have to enter the `db_config.php` file that is in this folder and place the correct data to access our database, which we will have to set up on our SQL server. You can find the code for it in the same `dataTFG` folder. In addition to this, we will have to choose the mode of our service, whether development or not, and if it is not, put the corresponding URL where indicated.

Once all the above is done, we can run the project in development mode from the terminal, always being in the folder where our project is, using the following command:

```
C:\xampp\htdocs\angular\tfgdefinitivo\Motorlan-tfgJavierRodriguez->ng serve -o
Component HMR has been enabled.
If you encounter application reload issues, you can manually reload the page to bypass HMR and/or disable this feature with the `--no-hmr` command line option.
Please consider reporting any issues you encounter here: https://github.com/angular/angular-cli/issues

Initial chunk files | Names         |  Raw size
main.js             | main          | 936.62 kB |
polyfills.js        | polyfills     |  90.20 kB |
styles.css          | styles        | 383 bytes |

                    | Initial total |   1.03 MB

Application bundle generation complete. [4.826 seconds]
```

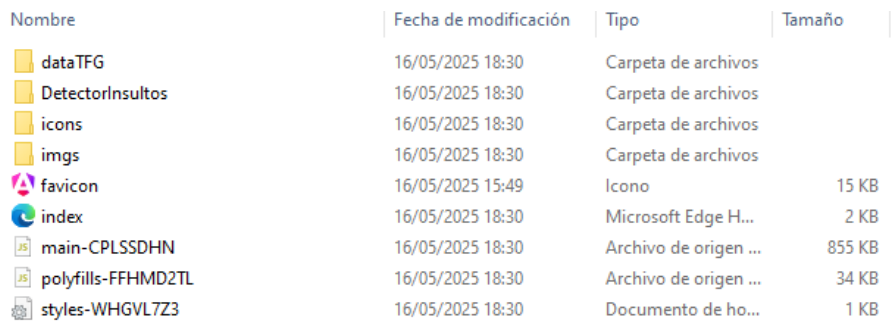
This is for development mode. If we wanted it in production mode, we should do the following:

The first thing will be to enter the three service files in the project (`servicios.service`, `servicios-eventos.service`, and `traducciones.service`). At the top, we will find two lines with two routes. We will see that one is commented out while the other is not. We will have to swap the commented line with the uncommented one. After this, we will execute the command:

```
C:\xampp\htdocs\angular\tfgdefinitivo\Motorlan-tfgJavierRodriguez->ng build
Initial chunk files   | Names         |  Raw size | Estimated transfer size
main-CPLSSDHN.js      | main          | 875.10 kB |               182.77 kB
polyfills-FFHMD2TL.js | polyfills     |  34.52 kB |                11.28 kB
styles-WHGVL7Z3.css   | styles        | 235 bytes |               235 bytes

                      | Initial total | 909.85 kB |               194.29 kB
```

After this, a series of files will be generated in the `dist` folder of our project, they will be in a folder called `browser`.



Nombre	Fecha de modificación	Tipo	Tamaño
dataTFG	16/05/2025 18:30	Carpeta de archivos	
DetectorInsultos	16/05/2025 18:30	Carpeta de archivos	
icons	16/05/2025 18:30	Carpeta de archivos	
imgs	16/05/2025 18:30	Carpeta de archivos	
favicon	16/05/2025 15:49	Icono	15 KB
index	16/05/2025 18:30	Microsoft Edge H...	2 KB
main-CPLSSDHN	16/05/2025 18:30	Archivo de origen ...	855 KB
polyfills-FFHMD2TL	16/05/2025 18:30	Archivo de origen ...	34 KB
styles-WHGVL7Z3	16/05/2025 18:30	Documento de ho...	1 KB

You will have to copy the last 4 files, and if you have not copied `dataTFG`, you will have to do it now. Make sure this is the only `index.html` in the root of your server (it must be in the root).

In addition, for the functionality of updating the language change to work correctly, we will have to add a `.htaccess` file to the root of our server (in XAMPP it is the `htdocs` folder), with the following content:

```
<IfModule mod_rewrite.c>
  RewriteEngine On
  RewriteBase /
  RewriteRule ^index\.html$ - [L]
  RewriteCond %{REQUEST_FILENAME} !-f
  RewriteCond %{REQUEST_FILENAME} !-d
  RewriteRule . /index.html [L]
</IfModule>
```

And make sure to have the module enabled:

LoadModule rewrite_module modules/mod_rewrite.so

For this module to be enabled, we will have to enter the `httpd.conf` file and uncomment the line if it is commented out.

Once we have done this, when we enter our server, the project will be displayed automatically.

8 Conclusiones y posibles ampliaciones

As the main conclusion from carrying out this project, I take away the experience I have accumulated in doing so. I have improved my ability to develop both on Angular (TypeScript language) and on PHP (used on the backend). I have acquired a large amount of new knowledge about both languages, as well as about the development of language control modules and bilingualism modules (specifically using JSON as a means of storing values). In addition to this, I have learned how to encrypt with much more advanced algorithms than those we used in class, which allows me to guarantee greater security in passwords.

As a possible expansion, the implementation of a night mode system that would change the white parts of the interface to a dark color, or the implementation of a real-time chat that allows private communication between users, would be interesting. I would also like to implement the sending of real-time notifications, for which we would have to use a WebSocket or a similar server.

9 Bibliografía

Icons
https://www.flaticon.es/

Angular Doc
AngularDev Ya

general coding info
Newest Questions - Stack Overflow

10 Anexos