

SEP 2024 - OCT 2024

SOFTWEAR - SPATIAL COMPUTING AND ANTHROPOMETRIC SURVEYS USING 3D BODY SCANNERS

XEON 2035

Monday 09 November 2024

SoftWear: The Journey Begins:

Perception:

"The world of how we shop is changing."



Reflections:

The world of how we shop is changing. With the rapid advancement of technology and the growing shift towards online retail, traditional methods of trying on clothes are becoming less relevant. softWEAR times to address this evolving landscape by offering a cutting-edge virtual try-on solution. By allowing users to see how garments fit in real-time through their phones/ iPads or even TV screens, softWEAR aims to enhance the online shopping experience, providing a more interactive and accurate way to assess clothing fit and style. We have seen a shift towards online retail, traditional fitting methods are becoming obsolete, leading to challenges such as expensive returns and uncertainty about fit.

This project, part of an MSc Computer Science dissertation at Birkbeck, University of London, addresses the demand for innovative digital solutions that bridge the gap between virtual shopping and real-world fitting, thereby enhancing accessibility and satisfaction in online fashion. It integrates the developer's skills in full-stack development with an interest in the rapidly evolving fields of Extended Reality (XR) and Augmented Reality (AR), aiming to provide a realistic and interactive fitting experience while meeting the increasing demand for advanced digital fashion solutions.

From this initial gem of an idea will emerge a comprehensive four-month feasibility study

encompassing both primary and secondary research. During this period, a period of concept evaluation will occur, consisting of entity-relationship design, testing, and development of a mock-up for a full-stack, responsive, interactive web application and mobile application will be undertaken. These foundational efforts are intended to support the implementation of XR/AR technologies.

In the coming two months, significant emphasis will be placed on conceptual ER design, testing, and development, with a focus on contemporary technologies and frameworks utilising tech stacks including JavaScript, Node.js and React.js, selected for their versatility and efficiency in constructing dynamic, full-stack applications. Additionally, a mock-up of a responsive, interactive web application and mobile application will be developed. This approach is designed to ensure that the application is both accessible and functional across a range of devices, which is crucial for delivering a seamless user experience. These preliminary tasks will establish a solid groundwork for the project and facilitate the integration of XR/AR technologies.

This will be called the preliminary stage. Overall, the stages are:

Preliminary Stage

The preliminary stage involves idea generation, encompassing nebulous thoughts surrounding cloud technology, and the development of a web application mock-up for the softWEAR test platform with RESTful API. This phase also includes explicit topic selection: Identifying the research area and formulating the research question.

Phase One: Project Commencement

The project commences in earnest with comprehensive primary and secondary research, alongside a thorough literature review. This phase requires the definition of specific aspects of virtual try-on technology and its impact on the fashion industry. A proposal is drafted, outlining the research objectives, methodology, and significance. The literature review consists of an extensive examination of existing research related to the topic, while the methodology design involves the selection of appropriate research methods and tools for data collection and analysis. Primary research is conducted through interviews with users, designers and retailers, or through experiments designed to gather feedback on the virtual try-on experience. Additionally, secondary research involves the analysis of existing data and publications pertinent to virtual fashion and augmented reality, alongside continuous improvements to the mock-up website.

Phase Two: Data Collection and Analysis

In this phase, data collection is undertaken, followed by thorough analysis. Findings are organised and prepared for analysis. Statistical or qualitative methods are applied to interpret user feedback and performance metrics. Primary research is again emphasised through interviews and experiments, while secondary research continues with the analysis of relevant publications. Furthermore, existing technologies are researched to determine feasible implementation strategies.

Phase Three: Project Development and Dissertation Writing

During this phase, the dissertation is drafted, encompassing sections on research background, methodology, findings, and discussions concerning the implications for the fashion industry. Revisions are made based on feedback from advisors or peers. By this stage, the mock-up website should be completed, and actual building and development of the softWEAR tech should be well underway, with ongoing programming and refinements.

Phase Four: Testing and Feedback

We could have a rough mock-up of the softWEAR and be able to demonstrate the virtual try-on concept with our mock-up web application via RESTful API. The website will have Authentication and authorisation verifying user credentials and permissions, error/exception handling endpoint routing, validation and verification and security considerations.

This phase involves rigorous testing, the collection of feedback, and the formation of focus groups, as well as unit testing to ensure functionality. The dissertation drafting continues, incorporating research background, methodology, findings, and discussions relevant to the fashion industry. Revisions are further refined based on continued feedback. The researcher prepares to defend their findings and methodology before a panel.

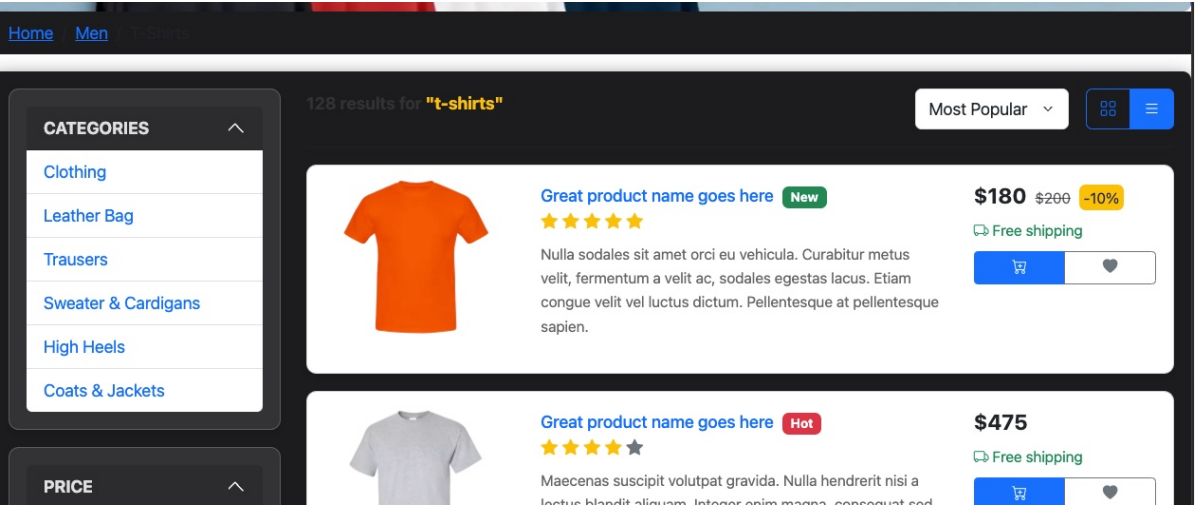
Phase Five - Final Submission

In the final stage, meticulous attention is devoted to formatting, ensuring that the dissertation complies with the specific guidelines established by the programme. The submission will include comprehensive documentation, a complete GitHub history, and an academic journal detailing the progress made throughout the research process. Additionally, all deliverables are compiled, including libraries, dependencies and a fully functional, non-locally hosted website that incorporates the softWEAR technology with a complete SQL database backend and JSON/RESTful API middleware/Express.js to facilitate interaction with softWEAR. This final document is submitted by the designated deadline, signifying the culmination of the research endeavour.

Sunday 15 November 2024

Create The Website Mockup:

Progress has been made on the initial mockup of the website, although a definitive name has yet to be decided.



At this stage, aesthetics are not a primary concern; the focus is on establishing a framework that can effectively accommodate the 3D clothing objects.

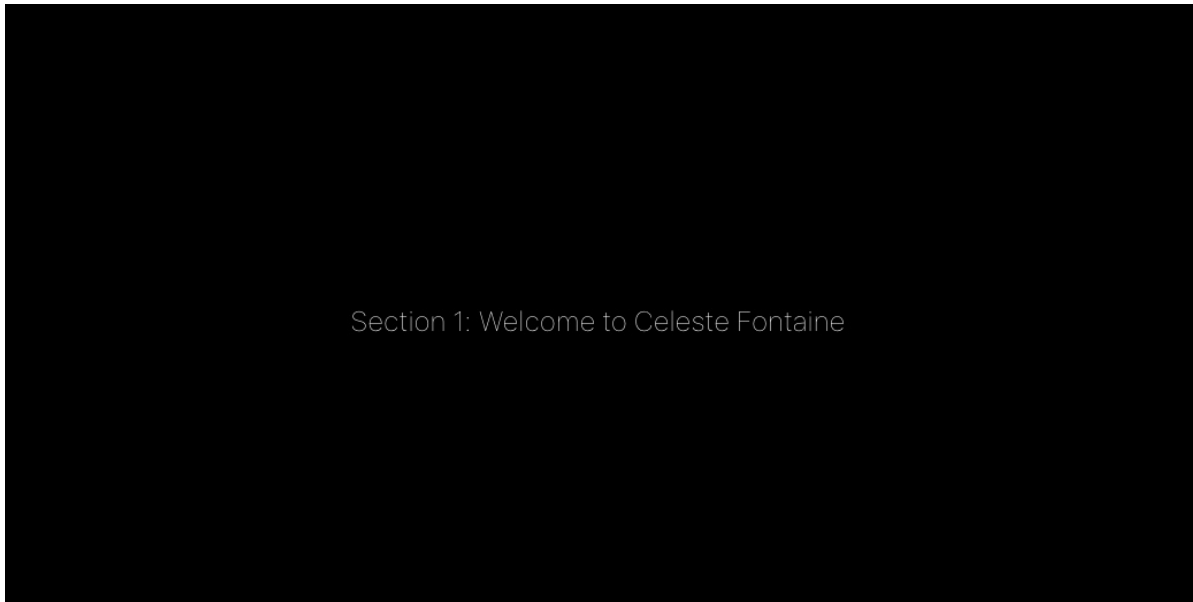
The primary objective is to leverage technologies such as Three.js or Babylon.js to convert the 3D models into a format compatible with the chosen framework, specifically GLTF or GLB for Three.js.

To facilitate this process, waveform .obj files will be created, inclusive of all associated textures and materials. Furthermore, it will be necessary to explore methods for reducing the file size of the .obj files, given that they are intended solely for viewing on the web, where high texture quality is not essential. One potential solution under consideration is the use of MeshLab technology.

Friday 20 November 2024

Progress Update on the Céleste Fontaine Landing Page Development

, efforts were focused on the design and implementation of a sophisticated landing page for the mock-up web page, now to be named: Céleste Fontaine - reflecting the sophisticated chic, upmarket target market who would utilise the sofWEAR app.



The focus was on achieving an Apple-inspired aesthetic with parallax scrolling effects.

Morning:

The day began with outlining the layout and structural components essential for the landing page. The design philosophy centred around creating a minimalistic interface, distinguished by large, impactful headings and a strategic application of whitespace to enhance user experience. The foundational architecture of the project was established, developing critical React components, particularly the `CelesteFontaine.js` file, which serves as the primary landing page interface.

Afternoon:

The afternoon saw development involved centred around exploring the implementation of a linear gradient background that transitions from a rich black to a subtle dark grey. This carefully selected colour scheme was intended to project a sleek and professional appearance while minimising visual distractions. Utilising the JavaScript ScrollMagic¹ interaction library, smooth scrolling effects were integrated across the various sections of the page. This feature was designed to provide a fluid user experience, embodying the elegance associated with Apple's design ethos. Additionally, the SF Pro font family was incorporated, applying varying weights to establish a clear typographic hierarchy

within the textual elements.

Evening:

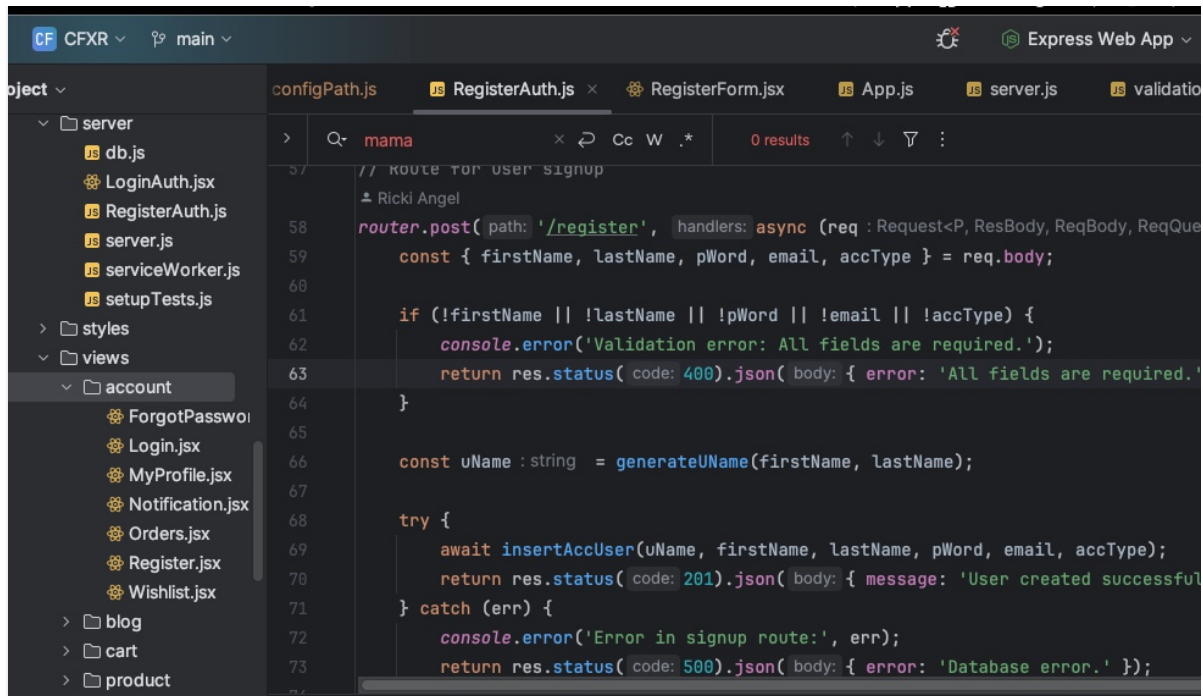
Thorough refinement of the CSS was conducted to ensure consistency and cohesion throughout the page. Each section was designed to occupy the full viewport height, thereby enhancing the parallax effect as users navigated through the content. Testing was performed to ensure the layout's responsiveness, allowing for optimal appearance across a variety of screen sizes. Finally, the latest changes were committed and pushed to GitHub, documenting progress made throughout the day.

¹ Credit: Scrollmagic 2.0.7 by John Polacek

<https://scrollmagic.io/docs/>

Monday 7 October 2024

Enhancing Frontend Registration and Streamlining Database Integration



Significant enhancements were made to the frontend registration form for the ongoing project. This involved addressing connectivity issues with the backend and ensuring successful data insertion into the database. The endeavor improved user experience and solidified the integration between the frontend and backend components of the application.

Technical Steps Undertaken

Refinement of the Registration Form Component:

The registration form component was refined using redux-form to manage the state effectively. This framework provides a robust solution for handling form submissions and validation. The form now includes essential validation checks to ensure that all required fields are completed correctly, which is crucial for maintaining data integrity and providing clear feedback to users when errors occur.

Backend Integration via RegistrationAuth Route:

Following the refinement of the frontend component, focus shifted to the RegistrationAuth route within the backend application. The objective was to ensure proper handling of incoming registration requests from the frontend. Thorough input validation was implemented, alongside the logic necessary to insert new user records into the database effectively.

Addressing Account Type Constraints:

A pivotal challenge encountered during this process was related to the account type field in the database. It was essential to ensure that this field could not be null upon insertion, necessitating

modifications to the frontend form to include this attribute. Through careful adjustments, the account type was successfully included in the data sent to the backend, thereby resolving any insertion errors.

Key Learnings

This experience underscored the importance of seamless integration between frontend and backend systems. Each component must function cohesively to ensure a smooth user experience. Additionally, valuable insights were gained regarding effective error handling and the significance of providing users with clear, informative feedback during the registration process.

Future Directions

With the registration functionality now fully operational, attention will shift toward enhancing user experience further by implementing features that allow users to update their profile information post-registration. This will not only empower users but also promote a more interactive and user-centred design approach.

In summary, today's efforts culminated in a successful enhancement of the registration process, marking a critical milestone in the project's development. There is anticipation in observing user feedback on these improvements and continuing to build upon this foundation in the coming phases of the project.

Wednesday 9 October 2024

Email Verification using JSON Web Tokens (JWT)

Work commenced on the user registration and email verification component of the project, which is integral to building a secure and user-friendly web application for the SoftWear project. The objective was to ensure that newly registered users would receive a verification email containing a secure token, enabling them to confirm their email address and activate their account. The verification process plays a critical role in the authentication and authorisation flow of the application, contributing to both system security and user accountability.

```

user created and transaction committed.
database connection closed.
mail sent: 250 Great success
attempting to connect to the database...
database connection established successfully.
executing SQL:
      INSERT INTO USER_ACC (UNAME, FNAME, LNAME, PWORD, EMAIL, ACCTYPE, CREATED, MODIFIED)
      VALUES (:uName, :firstName, :lastName, :pWord, :email, :accType, CURRENT_TIMESTAMP, C
CURRENT_TIMESTAMP)

with binds: {
  uName: 'rangel185',
  firstName: 'ricki',
  lastName: 'angel',
  pWord: 'ty7uhhjgjhinnjki',
  email: 'test@test.com',
  accType: undefined
}

user created and transaction committed.
database connection closed.
mail sent: 250 Great success

```

After extensive research into various verification mechanisms, JWT (JSON Web Token) was selected as the most suitable method for managing email verification. The selection criteria involved weighing the pros and cons of UUID-based verification against JWT-based verification. The key benefits that informed the choice included JWT's ability to:

Minimize Database Calls:

By embedding user data directly into the token, JWT reduces the need for multiple database

lookups, making the system more efficient. Enable Stateless Client-Side Management: JWT's nature allows client-side applications to manage user state effectively without persistent backend sessions.

Integrate Seamlessly with Other Features: JWT is versatile and will be used later in the development for managing login sessions and other stateful operations on the client side.

To proceed with JWT implementation, the following packages were installed:

```
npm install jsonwebtoken dotenv
```

These modules are essential for creating and verifying tokens (jsonwebtoken) and managing environment variables securely (dotenv).

. Backend Implementation of the Registration Endpoint

Route Creation and Configuration:

The registration route was set up on the Express backend to handle incoming POST requests from the client application. The implementation includes capturing the user's input, such as first name, last name, password, email, and account type. The objective was to create a new user record in the database and send a verification email.