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Department of Computer Engineering



Senior Design Project
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Conferencer
Analysis and Requirements Report

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1. Introduction

In the rapidly evolving landscape of academic conferences, the process of managing submissions, reviews, and program committees has become increasingly complex and time-consuming. Organizers and reviewers are often tasked with managing large volumes of data, ensuring fair and efficient review processes, and maintaining a high standard of academic integrity. Existing systems such as EasyChair, HotCRP, and OpenConf, while useful, fail to address the nuanced needs of modern conferences, particularly in terms of usability, flexibility, and integration with other academic platforms. Our purpose is to fulfill the lack of a comprehensive, user-friendly, and flexible conference management system.

Our proposed system, Conferencer, is designed to regularize and enhance the conference management process for academic events. It offers a centralized platform where organizers, reviewers, and authors can interact, collaborate, and efficiently manage the submission, and review processes. By focusing on user experience and integration with external platforms like ORCID, Web of Science, and Google accounts, the system aims to provide a flawless, intuitive, and secure environment for all stakeholders involved in the conferences.

The system is a set of carefully crafted functional requirements that address the various stages of the conference process, from initial conference setup to paper submission and reviewer management. The platform is designed to be flexible, allowing organizers to configure their conference events, define tracks, and manage paper submissions with ease. For authors, it provides a useful interface for submitting papers, tracking their status, and receiving feedback. Reviewers can have the benefit of a recommendation engine that matches them with papers based on their expertise, past performance, and conflict-of-interest declarations.

Role-based access control within the conference system ensures that users, whether they are authors, reviewers, or admins, have access to only the features relevant to their roles. Organizers can manage active sessions, set up auto-logout for inactive users, and ensure that the entire conference management process is secure and well-organized.

The system also focuses on performance and usability for program committee (PC) management. Organizers can invite potential PC members, and track the status of invitations. The system's intelligent search and filtering features help identify optimal reviewers for papers, and its historical performance data assists in making informed decisions about reviewer assignments. For multi-track conferences, the system provides dedicated tools for managing each track independently, allowing for customized workflows while maintaining confidentiality across tracks.

A key focus of the system is its reviewer management and performance evaluation tools. Reviewers can customize their profiles, declare conflicts of interest, and set preferences for the types of papers they wish to review. Conflict-of-interest detection system automatically flags potential issues by cross-referencing reviewer profiles with affiliations and

co-authorships. Track and conference chairs can rate reviews based on quality, and reviewers can also rate their peers to ensure the integrity and fairness of the review process.

Looking to the future, Conferencer plans to incorporate advanced technologies like Natural Language Processing (NLP) to detect reviews generated by large language models (LLMs). This will help to maintain the authenticity of the review process and prevent the use of automated tools to generate reviews that lack the depth and engagement expected of academic peer reviews. By integrating such tools, the system will ensure that the credibility and trust of the review process are maintained, while also enhancing the user experience for both authors and reviewers.

2. Current System

The existing conference management systems, such as EasyChair, HotCRP, and OpenConf, serve as the backbone for academic conference organization. These platforms enable fundamental functionalities like paper submission, review assignment, and decision-making workflows. However, despite their widespread adoption, they suffer from various shortcomings that hinder user experience and operational efficiency.

EasyChair, the most widely used platform, offers extensive functionality but has a user interface that is outdated and difficult to navigate, leading to frustration among new and even experienced users. While it supports large-scale conferences, its tools for managing multi-track events or shared program committees are limited, often requiring manual workarounds. HotCRP is a simpler platform but lacks the advanced customization and scalability required for larger conferences. OpenConf offers more flexibility in setup but comes at the cost of requiring significant technical expertise.

These systems also fail to meet modern expectations for usability and features. They lack integration with contemporary tools like Google or ORCID for login, making registration and account management tedious. There is no meaningful support for advanced fraud detection, such as identifying AI-generated reviews or troll behavior. Email notification systems are minimal and unreliable, leaving users uninformed about key updates. Furthermore, the inability to import data, such as program committee members from previous years, adds unnecessary complexity to conference setup. The lack of visibility into reviewer profiles and their past performance further limits organizers' ability to make informed decisions.

Overall, while these systems fulfill basic conference management needs, they fail to provide a seamless, user-friendly experience. There is a clear need for a next-generation platform that incorporates modern UI/UX principles, advanced fraud detection mechanisms, detailed analytics, and seamless integrations, addressing the evolving demands of academic conference organizers and participants.

3. Proposed System

3.1. Overview

Conferencer is a comprehensive platform designed to streamline academic conference management. It provides a centralized interface for organizers, reviewers, and authors to manage the conference lifecycle efficiently. Organizers can create and manage conferences,

set up tracks, and oversee paper submissions and review processes. Reviewers can easily match with papers based on their expertise and past performance, while authors can submit and track their papers' progress.

The system supports multi-track conferences, ensuring confidentiality and flexibility, and integrates with platforms like ORCID and Web of Science for enhanced reviewer verification. Reviewers can rate reviews and provide feedback, helping to improve the review process. Conferencer offers an intuitive user experience, improving efficiency and decision-making while addressing key limitations of existing systems.

3.2. Functional Requirements

3.2.1. User Authentication and External Integrations

3.2.1.1. User Authentication

- Support login via native accounts (email and password).
- Enable authentication through third-party services like:
 - Google accounts.
 - ORCID accounts.

3.2.1.2. Profile Management

- Allow users to create and manage their profiles securely.
- Provide functionality for updating personal details such as name, email, affiliation, and contact information.

3.2.1.3. Reviewer Integration with ORCID

- Allow reviewers to link their profiles with their ORCID accounts.
- Fetch and display verified reviewer information from ORCID (e.g., published works, affiliations).

3.2.1.4. Web of Science Integration

- Integrate with the Web of Science platform for:
 - Automatically recognizing peer review contributions.
 - Providing external validation for reviews to enhance credibility.
 - Allowing users to export their review history for professional or academic purposes.

3.2.1.5. Session Management

- Allow users to view and manage active sessions for their accounts.
- Implement auto-logout for inactive sessions to enhance security.

3.2.1.6. User Access Control

- Define role-based access for different user types:
 - **Authors:** Manage submissions and profile settings.
 - **Reviewers:** View assigned papers, submit reviews, and manage their profiles.
 - **Admins:** Configure settings, manage users, and moderate content

3.2.2. Program Committee Management

3.2.2.1. Program Committee Invitations and Importing

- Allow organizers to send personalized invitations to potential PC members.
- Enable bulk invitations via email or integrated platforms like ORCID or institutional directories.
- Track the status of invitations (e.g., sent, accepted, declined).
- Provide functionality to import PC members from:
 - Previous years' committees.

- External files (e.g., CSV, Excel).
- Allow bulk editing or updating of imported member details.

3.2.2.2. PC Member Search, Filtering, and Assignment

- Enable search functionality for PC members using:
 - Keywords (e.g., expertise, affiliation, research area).
 - Past review scores or feedback
 - Availability status or number of assigned papers.
 - Suggest optimal reviewers for papers based on research interests, past performance, or conflicts of interest.

3.2.2.3. Conflict of Interest and Role Management

- Allow PC members to declare conflicts of interest, with automatic detection based on affiliations or co-authorship.
- Support role-based permissions (e.g., senior reviewer, chair) for efficient committee management.
- Enable organizers to define different roles for PC members (e.g., senior reviewer, junior reviewer, chair).
- Assign specific permissions based on roles (e.g., paper reassignment for chairs).

3.2.2.4. Reviewer Performance and Historical Data

- Track PC member performance metrics such as timeliness, review quality, and engagement.
- Maintain historical data on PC member contributions for future reference and analytics.

3.2.2.5. Communication and Notifications

- Enable internal messaging for announcements, reminders, and direct communication between organizers and PC members.
- Provide email notifications for assignments, deadlines, and updates.

3.2.3. Conference Creation and Call for Papers

3.2.3.1. Conference Setup

- Organizers can create new conferences by specifying key details such as:
 - Conference series (e.g., annual event, specific academic field).
 - Year of the conference.
 - Track structure, allowing multiple tracks for different research areas or themes.

3.2.3.2. Track Configuration

- Organizers can define individual tracks within the conference, including:
 - Track names (e.g., "Artificial Intelligence," "Data Science").
 - Description of the focus or theme for each track.
 - Specific submission criteria and deadlines for each track.
 - Ability to modify track details as needed during the setup process.

3.2.3.3. Generation of Call for Papers (CFP)

- Organizers can easily generate a Call for Papers (CFP) for the conference, including:
 - Overview of the conference, including key dates, themes, and submission guidelines.
 - Track-specific submission details, ensuring potential contributors understand the focus of each track.
 - Submission deadlines, abstract submission windows, and final paper submission requirements.

- Formatting guidelines, word count limits, and other submission criteria for papers.

3.2.3.4. CFP Distribution

- Enable organizers to distribute the CFP to potential participants through:
 - Email notifications.
 - Integration with academic mailing lists or online academic networks.

3.2.4. Paper Submission & Tracking

3.2.4.1. Intuitive Paper Submission Interface

- Authors can easily upload their manuscripts and accompanying materials (e.g., supplementary files, and abstracts) through a user-friendly interface.
- The interface supports multiple file formats (e.g., PDF, Word, LaTeX) for easy submission.

3.2.4.2. Submission Tracking

- Authors can track the status of their papers throughout the entire submission process, including:
 - Initial submission.
 - Review stage
 - Final decision (acceptance, rejection, revisions).
- The system tracks and manages all critical submission and review deadlines.

3.2.4.3. Automated Compliance Checks

- The system performs automated checks for:
 - Formatting compliance (e.g., font size, margins, title page).
 - File requirements (e.g., maximum file size, acceptable file types).

3.2.4.4. Review Assignment and Monitoring

- Organizers and reviewers can easily assign papers for review based on expertise, availability, or conflicts of interest.
- Reviewers are notified when they have new assigned papers, along with key deadlines.
- Organizers can monitor submission progress and track review completion to ensure timely processing of papers.

3.2.4.5. Submission Status Dashboard

- Provide a dashboard for both authors and organizers to view the overall submission and review status, including:
 - Number of submissions received.
 - Papers under review, awaiting revisions, or completed.
 - Reviewer assignments and feedback.

3.2.5. Multi-track Handling

3.2.5.1. Track Support and Management

- The system accommodates both single-track and multi-track conferences, providing flexibility for different organizational structures.
- Each track in multi-track conferences can be managed independently by its respective track chair, allowing:
 - Separate configurations for submission criteria, deadlines, and review processes.
 - Customization of workflows specific to the needs of each track.

3.2.5.2. Shared PC Across Tracks

- For conferences like the Intelligent Systems for Molecular Biology (ISMB), a shared PC can be utilized across tracks.
- PC members can contribute to multiple tracks while ensuring fair workload distribution.

3.2.5.3. Reviewer Handling

- PC members can specify the maximum number of papers they are willing to review across all tracks.
- The system enforces these preferences to prevent reviewer overload and ensure equitable distribution of assignments.
- Track chairs are responsible for managing reviewer assignments within their track, ensuring:
 - Confidentiality between tracks, as chairs will not have direct access to assignments in other tracks.
 - Fair allocation of papers to reviewers based on expertise and workload preferences.
- Track chairs can monitor overall reviewer quotas to ensure balanced assignment across tracks.
- Real-time updates help chairs manage resources effectively and avoid delays in the review process.

3.2.5.4. Cross-Track Confidentiality

- Reviewer assignments are kept confidential across tracks, maintaining the integrity and independence of the review process.
- Track chairs can only view aggregate metrics, such as total papers reviewed or pending, across the shared PC.

3.2.6. Assigning Reviewer System

3.2.6.1. Reviewer Recommendation Engine

- The system includes a built-in recommendation engine to streamline the reviewer assignment process.
- Recommendations are based on automated text analysis of submissions, ensuring accurate reviewer-paper matching.

3.2.6.2. Similarity Analysis

- The system extracts relevant keywords from the paper title, abstract, and content.
- Keywords are matched against reviewers' areas of expertise and research interests, ensuring alignment with their knowledge domains.
- The recommendation engine analyzes the similarity between the paper's abstract and reviewers' past publications or expertise.
- This ensures that reviewers are assigned papers closely aligned with their background, improving review quality.

3.2.6.3. Reduced Manual Workload for Chairs

- The automated recommendations minimize the need for manual reviewer searches, saving time for track chairs and organizers.
- Chairs can approve, modify, or override recommendations as needed for specific cases.

3.2.6.4. Transparent Assignment Process

- Track chairs can view a detailed breakdown of why a reviewer was recommended, including:
 - Keyword matches.

- Similarity scores.
- Past review performance metrics.

3.2.7. Reviewing Assigned Papers

3.2.7.1. Visibility for Conference and Track Chairs

- Conference Chairs:
 - Can view all reviews submitted within their conference (e.g., RECOMB 2025).
- Track Chairs:
 - Have access only to reviews specific to their assigned track (e.g., ISMB 2026 Sequence Analysis), maintaining confidentiality across tracks.

3.2.7.2. Personalized Reviewer Profiles

- Reviewers (PC members) can customize their profiles by specifying:
 - Keywords or topics they prefer to review.
 - Keywords or topics they wish to avoid.
 - Agreements to review specific tracks in shared multi-track conferences.

3.2.7.3. Conflict-of-Interest Detection

- The system automates conflict-of-interest checks by cross-referencing:
 - Registered kinship statuses.
 - Past mentor-student relationships.
 - Institutional affiliations and recent collaborations.

3.2.7.4. Review Quality Ratings by Chairs

- Track and conference chairs can rate reviews based on factors like clarity, depth, and helpfulness.
- These ratings help identify reliable reviewers for future conferences or tracks.
- Review ratings can optionally be shared across the same conference series to aid in future planning.
- Ratings remain anonymous to protect reviewer privacy and ensure fairness.
- Reviewers cannot access their own ratings or see feedback provided by chairs.
- Access to ratings is restricted to authorized users (e.g., chairs and organizers).

3.2.7.5. Peer Ratings for Reviewers

- Reviewers can rate their peers' reviews on the same paper, focusing on:
 - Fairness of comments.
 - Constructiveness and relevance of feedback.
- Peer ratings contribute to maintaining accountability and enhancing review quality.

3.2.8. User Profile Page

3.2.8.1. Profile Fields

- The system provides each reviewer with a personalized profile page for managing their information and preferences.
- The profile includes the following fields:
 - **Personal Information:** Name and email address.
 - **Professional Details:** Current and past affiliations.
 - **Expertise:** Areas of expertise and research interests.
 - **Keywords:** Topics they prefer to review or avoid.
 - **Conflict-of-Interest Declarations:** Relationships or circumstances that may affect review impartiality.
 - **Track Preferences:** Preferences for specific tracks in multi-track conferences.

3.2.8.2. Visibility for Organizers and Chairs

- Certain fields, such as name, email, and areas of expertise, are optionally visible to conference organizers and track chairs to facilitate reviewer selection.
- The visibility is configurable, allowing reviewers to control what information is shared.

3.2.8.3. Privacy of Sensitive Details

- Sensitive fields, such as conflicts of interest and personal preferences, remain private and are not accessible to conference organizers or chairs.
- These fields are used solely for automated checks and assignments.

3.2.8.4. Integration with External Platforms

- Profile functionality mirrors established platforms like ORCID and Web of Science, making it familiar and user-friendly for reviewers.
- Reviewers can link their profiles to external accounts for streamlined management.

3.2.9. LLM-Generated Review Detection (Future Plan)

3.2.9.1. Purpose of Detection Tools

- The system will incorporate tools designed to identify and flag reviews generated by large language models (LLMs).
- This feature aims to maintain the authenticity and quality of submitted reviews, ensuring a fair review process.

3.2.9.2. Natural Language Processing (NLP) Techniques

- Detection tools will leverage advanced NLP algorithms to analyze review content for patterns indicative of automation.
- Key analysis techniques may include:
 - **Text Uniformity:** Identifying overly generic or repetitive phrasing.
 - **Lack of Contextual Depth:** Detecting reviews that fail to engage meaningfully with the paper's content.
 - **Language Patterns:** Highlighting stylistic markers typical of LLM-generated text.

3.2.9.3. Improving Review Credibility

- By identifying potentially automated reviews, the system ensures the credibility of the review process.
- This feature helps maintain trust among authors, reviewers, and organizers.

3.3. Non-functional Requirements

3.3.1. Usability

The usability of the system will be driven by React, which will provide a dynamic, modern, and user-friendly interface for the platform. React enables the efficient development of a satisfying user experience with minimal load times and smooth interactions. Users will enjoy a consistent interface across different browsers, with features such as real-time feedback, easy navigation, and intuitive forms. React will also allow the front-end to integrate seamlessly with the back-end, ensuring that conference data is always up-to-date. Java Spring Boot will handle the back-end logic and data processing, enabling the front-end to fetch and display necessary information reliably.

3.3.2.Reliability

To ensure the reliability of the system, Java Spring Boot will handle the back-end services. The framework's built-in features, such as transaction management, error handling, and fault tolerance, will ensure that critical operations like paper submissions and reviewer assignments remain operational, even if some components experience failures. Spring Boot's integrated support for PostgreSQL through Hibernate will guarantee that the database is used efficiently, with automatic transaction management ensuring data integrity. Additionally, Spring Boot's monitoring and logging capabilities, specifically with the help of the actuator, will help the system proactively detect and recover from potential issues, ensuring the platform meets an uptime goal of 99.9%.

3.3.3.Performance

The performance of the system will be optimized through the combined use of React on the front-end and Java Spring Boot on the back-end. React will allow for fast, dynamic updates to the user interface, ensuring a responsive experience with sub-second load times for user actions such as filtering reviewer profiles or submitting papers. On the back-end, PostgreSQL will be used for efficient data storage, with Spring Boot's built-in support for optimizing database queries and handling large volumes of data. The platform will also leverage asynchronous processing to perform time-consuming tasks in the background, ensuring that the user interface remains responsive during peak activity times, such as submission and review periods.

3.3.4.Scalability

While the system will use a monolithic architecture, it will be designed with scalability in mind to handle increasing traffic and growing amounts of conference data. React's modular structure will ensure that new features can be added without disrupting the user experience. On the back-end, Java Spring Boot will handle the scalability needs through its support for load balancing and horizontal scaling at the application level, without relying on microservices. PostgreSQL will be optimized to scale efficiently as the platform's data grows, ensuring that performance is maintained even as more conferences, submissions, and reviewers are added. By using Spring Boot's built-in tools for database access, such as Spring Data, and focusing on optimizing database queries, the platform will scale without a problem along with accommodating growing demand. The system's scalability aligns with the AWS Well-Architected Framework, ensuring that it can handle increased user demand while maintaining performance and reliability [1].

3.4. Pseudo Requirements

1. The system supports multiple user roles.
2. Organizers can create and manage both single-track and multi-track conferences.
3. Tracks can have unique themes, submission criteria, and deadlines.
4. Organizers can send invitations to PC members individually or through bulk imports.
5. Reviewer-paper matching uses automated recommendations based on expertise and keywords.
6. Authors can submit their papers through a user-friendly interface.
7. Multiple file formats for submission are supported (e.g., PDF, Word,).
8. Authors can track submission statuses, from initial submission to final decision.
9. Organizers and reviewers can monitor review progress and completion.
10. The system automates compliance checks for formatting and file requirements.
11. Conflict-of-interest checks are conducted automatically based on affiliations and prior relationships.
12. PC members can declare conflicts of interest and update them as needed.
13. The system supports advanced workflows, including paper bidding and lead reviewer roles.
14. Organizers can define and assign roles (e.g., senior reviewer, track chair) for PC members.
15. Timeline dashboards display submission and review statuses for organizers and authors.
16. The system ensures fair workload distribution across reviewers in multi-track conferences.
17. Confidentiality between tracks is maintained for reviews and reviewer assignments.
18. Reviewer performance metrics, including timeliness and review quality, are tracked for future use.

3.5. System Models

3.5.1. Scenarios

3.5.1.1. User Authentication and External Integrations

Actors: Users (Superchair, Trackchair, PC Member, Reviewer, Subreviewer, Author)

Goal: Allow users to securely log in and integrate external accounts like ORCID or Web of Science.

Main Flow:

1. The user accesses the login page.
2. The user enters their credentials or selects an external authentication provider.
3. The system verifies the credentials.
4. If the credentials are valid, the user is redirected to their dashboard.

5. The user can link external accounts (e.g., ORCID) via a dedicated integration page.

Alternate Flows:

- The system displays an error message and prompts the user to try again or reset their password.
- The system notifies the user of the integration error and logs the issue.

3.5.1.2. User Signup and External Integrations

Actors: Users (Superchair, Track Chair, PC Member, Reviewer, Subreviewer, Author)

Goal: Allow users to create an account securely and optionally link external accounts like ORCID or Web of Science.

Main Flow:

1. The user accesses the signup page.
2. The user enters the required registration details (e.g., name, email, password).
3. The system validates the submitted details (e.g., email format, password strength).
4. If the details are valid, the system creates the user account and sends a verification email.
5. The user verifies their email by clicking the link in the verification email.
6. Upon verification, the user is directed to their dashboard.
7. The user can link external accounts (e.g., ORCID) via a dedicated integration page.

Alternate Flows:

- If the user enters invalid details (e.g., weak password or invalid email), the system displays an error message and prompts the user to correct the information.
- If the user does not verify their email, they are unable to log in.
 - The system allows the user to resend the verification email.
- If external account linking fails, the system notifies the user of the error and logs the issue for troubleshooting.

3.5.1.3. Go To Existing Conferences

Actors: User

Goal: Allow users to view their past or active conferences.

Main Flow:

1. In the homepage, the user can see separate lists of past or active conferences, displaying general information such as name, description, or Superchair(s).
2. In these lists, the user can go to the conference view of these conferences by clicking on them.

3.5.1.4. Import Conference Members and Configurations From Past Conferences

Actors: Superchair

Goal: Allow users to use the members and the configurations of their past conferences.

Main Flow:

1. In the conference creation view, the user clicks on the “Import From Past” button.
2. The user’s past conferences are displayed in a list. The user selects a conference from this list.
3. The user clicks on the “Import” button to finalize the import.
4. The conference creation view is opened with the relevant info already filled.

Alternate Flows:

- The user cancels the import before it is finalized.

3.5.1.5. Import Conference Members From Excel File

Actors: Superchair

Goal: Allow users to use the members from an excel file.

Main Flow:

1. In the conference creation view, the user clicks on the “Import From Excel” button.
2. The user is prompted to upload an Excel file with the correct format explained on the screen.
3. The user clicks on the “Import” button to finalize the import.
4. The conference creation view is opened with the relevant info already filled.

Alternate Flows:

- The user cancels the import before it is finalized.
- The user uploads an incorrectly formatted file, which results in discarding the operation.

3.5.1.6. Edit Imported Members and Configurations

Actors: Superchair

Goal: Allow organizers to create a new conference on the system.

Main Flow:

1. In the create conference view, some fields are already filled from the import. The user can make changes as they wish.
2. After the changes, the user clicks on the “Create” button to finalize the creation of the conference

3. The conference is created in the system

Alternate Flows:

- The user cancels the creation before it is finalized

3.5.1.7. Sending Invitations to Potential Conference Members

Actors: Superchair, Potential Conference Member

Goal: Allow organizers to invite new members to join the conference.

Main Flow:

1. The organizer accesses a conference that he is the superchair of.
2. The organizer clicks the “Invite People” button.
3. The system displays a form where the organizer enters the email addresses (or ID or name, if present in the system) of potential conference members and an optional personalized invitation message.
4. The organizer submits the invitation of the conference member by clicking on the add to conference button.
5. The system sends email invitations to potential conference members.
6. The potential conference member receives the email and clicks the invitation link.
7. The system prompts the conference member to accept or decline the invitation.
8. If the invitation is accepted, the user is added to the conference.

Alternate Flows:

- If an email address is invalid, the system notifies the organizer and skips that email.
- If a potential PC member declines the invitation, the organizer receives a notification.

3.5.1.8. Create New Conference

Actors: User (Superchair)

Goal: Allow organizers to create a new conference on the system.

Main Flow:

1. The user clicks on the “Create Conference” button
2. The user is taken to the create conference view.
3. The user enters details of the conference such as name, shortened name, and track limit.
4. The user sets the conference configuration with options such as abstract requirement, submission visibility, viewer visibility, and several other privacy settings.
5. The user optionally adds other superchairs.

6. The user clicks on the “Create” button to finalize the creation of the conference
7. The conference is created in the system

Alternate Flows:

- The user cancels the creation before it is finalized

3.5.1.9. Create New Track

Actors: User (Superchair),

Goal: Allow organizers to create a new track in the conference.

Main Flow:

1. In the conference view, the user clicks on the “Add Track” button.
2. The user is taken to the track creation view.
3. The user enters the name, and the calendar of the track, and optionally selects track chairs.
4. The user clicks on the “Add” button to finalize the creation of the track.
5. The new track is created and added to the existing conference.
6. The user is a Track Chair of the created track by default.

Alternate Flows:

- The user cancels the creation before it is finalized

3.5.1.10. Assign Superchair

Actors: User (Superchair), Potential Superchair

Goal: Allow the Superchair to add new Superchairs to the conference.

Main Flow:

1. User traverses to a conference view where they have the role of Superchair
2. In the conference view, the user clicks on the “Add Superchair(s)” button.
3. A pop up opens and lists the existing users in the conference with a search bar.
4. From the list of people in the conference user selects the desired superchairs. Or, the user can find an outside user by searching to invite them as Superchairs.
5. After the selection of the relevant users, the user clicks on the “Add Superchair” button in the pop up.
6. The users existing at the conference are assigned the Superchair role, and the outside conference users are added as Superchair after they accept the invitation.

Alternate Flows:

- The user cancels the assignment before it is finalized.

- Outside conference users do not accept the invitation and they are not added as superchair.

3.5.1.11. Assign Track Chair

Actors: User (Track Chair)

Goal: Allow Track Chairs to create a new track in the conference.

Main Flow:

1. In the conference view, the user traverses to a track where they have the role of Track Chair
2. In the track view, the user clicks on the “Add Track Chair(s)” button.
3. A pop up opens and lists the existing users in the conference with a search bar.
4. From the list of people in the conference user selects the desired Track Chairs.
5. After the selection of the relevant users, the user clicks on the “Add Track Chair” button in the pop-up.
6. The selected users are assigned to the track char role in that track.

Alternate Flows:

- The user cancels the assignment before it is finalized.

3.5.1.12. See Conference Overview

Actors: User (Superchair)

Goal: Allow Superchairs to view general stats and information of the conference

Main Flow:

1. The user traverses to a conference view where they have the role of Superchair
2. The user clicks on the “Conference Overview” button.
3. A new view is opened that displays the relevant stats, calendars, tracks, and members of the conference.
4. The user can go back to the conference/track view by clicking on the “Switch Back to Track View” or clicking a track on the track list, which selects that track as the selected track in the track view.
5. The user can search or filter the conference members by track in the displayed member list.
6. The user can view the profiles of the listed conference members by clicking on the profile icon in the listing.

3.5.1.13. Switch Tracks

Actors: User (Superchair, Track Chair, PC Member, Reviewer, Subreviewer)

Goal: Allow users to traverse between different tracks in the conference

Main Flow:

1. In the conference view, the user clicks on the arrows on the sides of the track information display.
2. The view switches tracks and user traverses to the next or previous track that they have access to.
3. The information on the screen is updated to display the information of the track that is being switched to.

3.5.1.14. View the Profile of a User

Actors: User (Superchair, Track Chair, PC Member, Reviewer, Subreviewer)

Goal: Allow users to traverse between different tracks in the conference

Main Flow:

1. The users can see the profiles of the other users by, clicking on the profile icon:
 - in the listing of track members in the track view.
 - in the listing of conference members in the conference overview
 - in the displayed list in the pop-up that opens up for any assignment, or invitation
2. The users can only view information that is public or information about the conference that they are a part of in other users' profile

3.5.1.15. View Paper Submissions and Assignments (in the conference)

Actors: User (Superchair, Track Chair)

Goal: Allow users to view the paper assignments in the track.

Main Flow:

1. In the track view, the user clicks on the “View Submissions and Paper Assignments” button.
2. The user goes to a view where the submitted papers are listed in the track. This list displays papers and the reviewers they are assigned to.
3. The user can filter/search by paper title, author name, assigned reviewer name, and total assigned reviewers to a paper.
4. The user can go back to the conference/track view by clicking on the “Switch Back to Track View”

3.5.1.16. Create a Submission

Actors: User (Author)

Goal: Allow users to submit their paper

Main Flow:

1. The user clicks the “Create a Submission” button in the conference view.
2. The user selects the track they want to upload to.
3. The user enters the details of the paper such as the title, and keywords.
4. The user uploads the file by clicking on the “Choose File” button
5. The paper is submitted, and the user is taken to the submission details view.

Alternate Flows:

- The user cancels the submission before it is finalized.

3.5.1.17. View Submission Report

Actors: User (Author)

Goal: Allow users to view the details of their submission.

Main Flow:

1. The user clicks on “My Submissions” item on the left sidebar
2. Here, the user views a list of the deleted and active submissions.
3. The user clicks on the “See Submission Report” button.
4. The user goes to the submission report view.

3.5.1.18. View Assigned Papers (to the user)

Actors: User (Reviewer)

Goal: Allow users to view the papers assigned to them

Main Flow:

1. In the left sidebar, the user clicks on the “My Tasks” button.
2. A list of active and past assignments is displayed to the user.
3. The user can download the paper by clicking on the “Download Paper” button, and see the details in the display.

3.5.1.19. Submit Review to Assigned Paper

Actors: User (Reviewer)

Goal: Allow users to view the papers assigned to them

Main Flow:

1. In the “My Tasks” view, the user selects the assignment they want to give feedback on.
2. The user can either enter text or upload a .txt file to give their feedback.
3. The user fills out the metrics set by the organizer.

4. The user clicks on the “Upload Review” button to finalize the process

Alternate Flows:

- The user cancels the upload before it is finalized.

3.5.1.20. View My Papers

Actors: User (Reviewer)

Goal: Allow users to view the papers assigned to them

Main Flow:

1. In the left sidebar, the user clicks on the “My Tasks” button.
2. A list of active and past assignments is displayed to the user.
3. The user can download the paper by clicking on the “Download Paper” button, and see the details in the display.

3.5.1.21. View Invitations

Actors: User (Superchair, Track Chair, PC Member, Reviewer, Subreviewer)

Goal: Allow users to view the invitations sent to them

Main Flow:

1. In the top bar, the user clicks on the bell icon.
2. A list of active invitations is displayed to the user.
3. The user can view further details by clicking on the invitation message.

3.5.1.22. Answer Invitations

Actors: User (Superchair, Track Chair, PC Member, Reviewer, Subreviewer)

Goal: Allow users to answer the invitations sent to them

Main Flow:

1. In the notifications list, the user clicks on the buttons “Accept” or “Decline”
2. An answer notification is sent to the sender of the invite.

3.5.1.23. Traverse Upcoming Conferences

Actors: User (Superchair, Track Chair, PC Member, Reviewer, Subreviewer)

Goal: Allow users to view the upcoming conferences

Main Flow:

1. The user clicks on the “Upcoming Conferences” button in the left sidebar.
2. A list of conferences is shown to the user which can be filtered and searched.

3.5.1.24. Assign Subreviewer

Actors: User (Reviewer)

Goal: Allow users to assign Subreviewers to their assigned review.

Main Flow:

1. In the “My Tasks” view, the user selects the assignment and clicks on the “Assign Subreviewer” button.
2. The user selects a Subreviewer by searching them in the system. By their ID, email, or name
3. An invite notification is sent to the selected user.

3.5.1.25. View Reviews

Actors: User (Superchair, Track Chair)

Goal: Allow users to assign Subreviewers to their assigned review.

Main Flow:

1. In the conference/track “submissions and assignments” view, the submitted reviews are displayed next to the
2. Here the Subreviewers’ reviews are listed.
3. The user clicks on the review they want to read.
4. The review is displayed on the screen.

3.5.1.26. View Subreviews

Actors: User (Reviewer)

Goal: Allow users to view the assigned reviews of Subreviewers.

Main Flow:

1. In the “My Papers” view, the user selects the assignment and sees the details.
2. Here the Subreviewers’ reviews are listed.
3. The user clicks on the review they want to read.
4. They can add a message to the review of the subreviewer.

3.5.1.27. Rate the Reviews

Actors: User (Superchair, Track Chair, PC Member)

Goal: Allow users to rate the reviews on some characteristics.

Main Flow:

1. In the “View Reviews” view, the user fills out scores on the metrics set by the conference.
2. The user clicks on the “Submit Rating” button.
3. The ratings are recorded in the rated users’ profiles.

3.5.1.28. Settings

Actors: User (Superchair, Track Chair, PC Member, Reviewer, Subreviewer)

Goal: To accomplish any customization, or edit user information

Main Flow:

1. Click the “Settings” button at the bottom of the left bar, or click on the user icon on the appbar, then click on “Settings”
2. The user clicks on the change theme button to change the background theme.
3. The user can enable or disable email notifications.
4. The user can send feedback to developers.
5. The user clicks on the “Save” button to save the changes made.

3.5.1.29. Send/Receive Messages

Actors: User (Superchair, Track Chair, PC Member, Reviewer, Subreviewer)

Goal: Allow users to send and receive messages to each other through the system.

Main Flow:

1. Either by clicking the “Messages” button on the left bar, or click on the Message Icon in the top bar, the user accesses the messages page.
2. This page displays previous chats.
3. The user can start a new chat by searching for a user on the search bar and selecting them.
4. After the message is sent the new chat is started

Alternate Flows:

- The user can go into existing chats, read the messages, and reply to them in these chats.

3.5.1.30. Accept/Decline Papers

Actors: User (Track Chair)

Goal: Allow users to rate the reviews on some characteristics.

Main Flow:

1. In the “View Reviews” view, the user clicks on either the “Accept” or “Decline” buttons to make the final decision about the paper.

3.5.1.31. View & Edit Own Profile

Actors: User (Superchair, Track Chair, PC Member, Reviewer, Subreviewer)

Goal: View and edit users’ own profile page.

Main Flow:

1. The user clicks on the “Profile” button on the left bar, or profile icon on the appbar.

2. The user can view the profile page.
3. By clicking on the edit profile information, user can edit:
 - a. The user can add or remove affiliations by clicking the “Affiliations” button.
 - b. The user clicks on the “Edit information” button to change the account's information.
4. User clicks on “Save” button to save the changes made.

3.5.1.32. Log Out

Actors: User (Superchair, Track Chair, PC Member, Reviewer, Subreviewer)

Goal: End users' session and provide security.

Main Flow:

1. The user clicks on the “Logout” button either in the left bar or at the top bar.
2. The user needs to be log in to access the system afterwards.

3.5.2. Use-case Model

3.5.2.1. User Management and Authorization

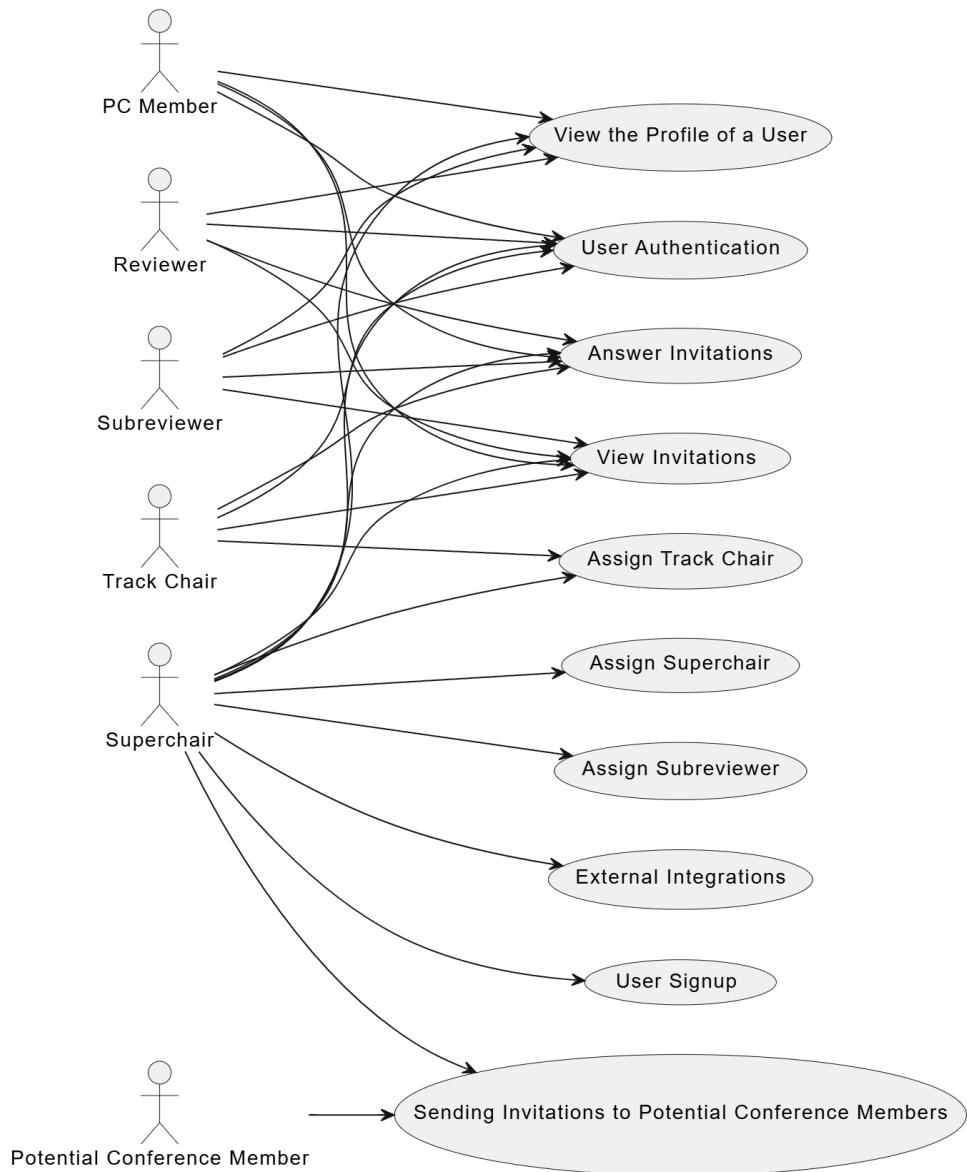


Diagram 1: Use Case Diagram for User Management and Authorization
3.5.2.2. Conference and Organization Management

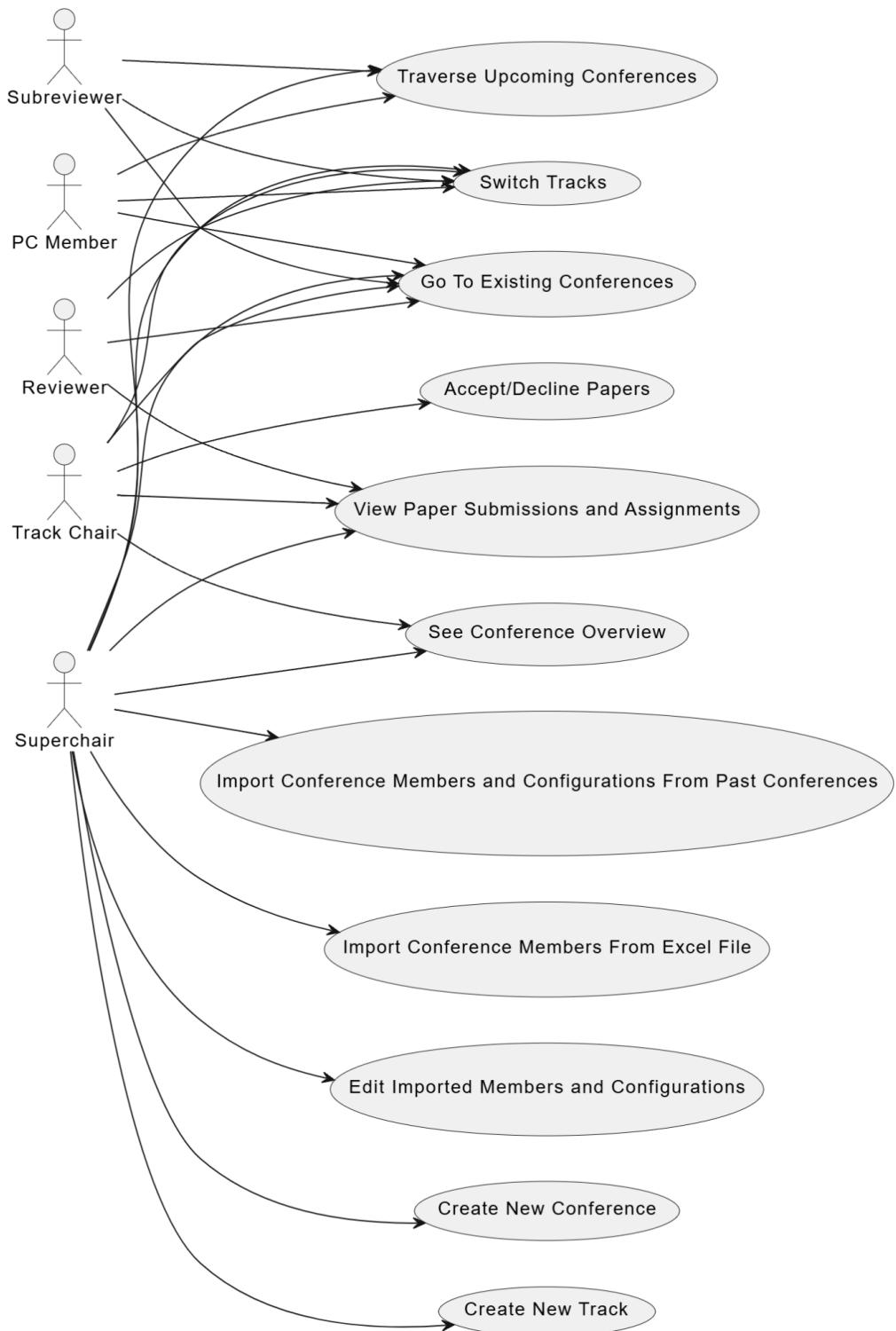


Diagram 2: Use Case Diagram for Conference and Organization Management

3.5.2.3. Participant and Content Management

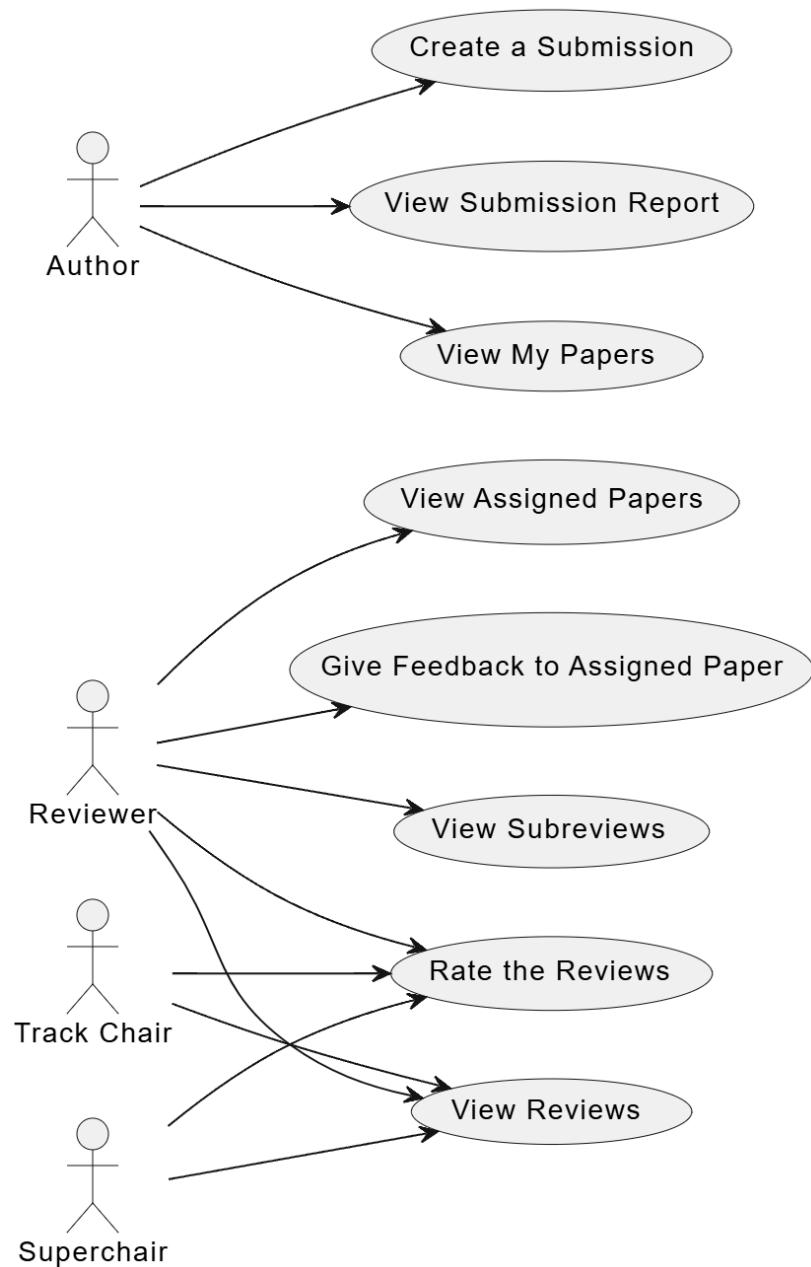


Diagram 3: Use Case Diagram for Participant and Content Management

3.5.2.4. General Settings and Interaction

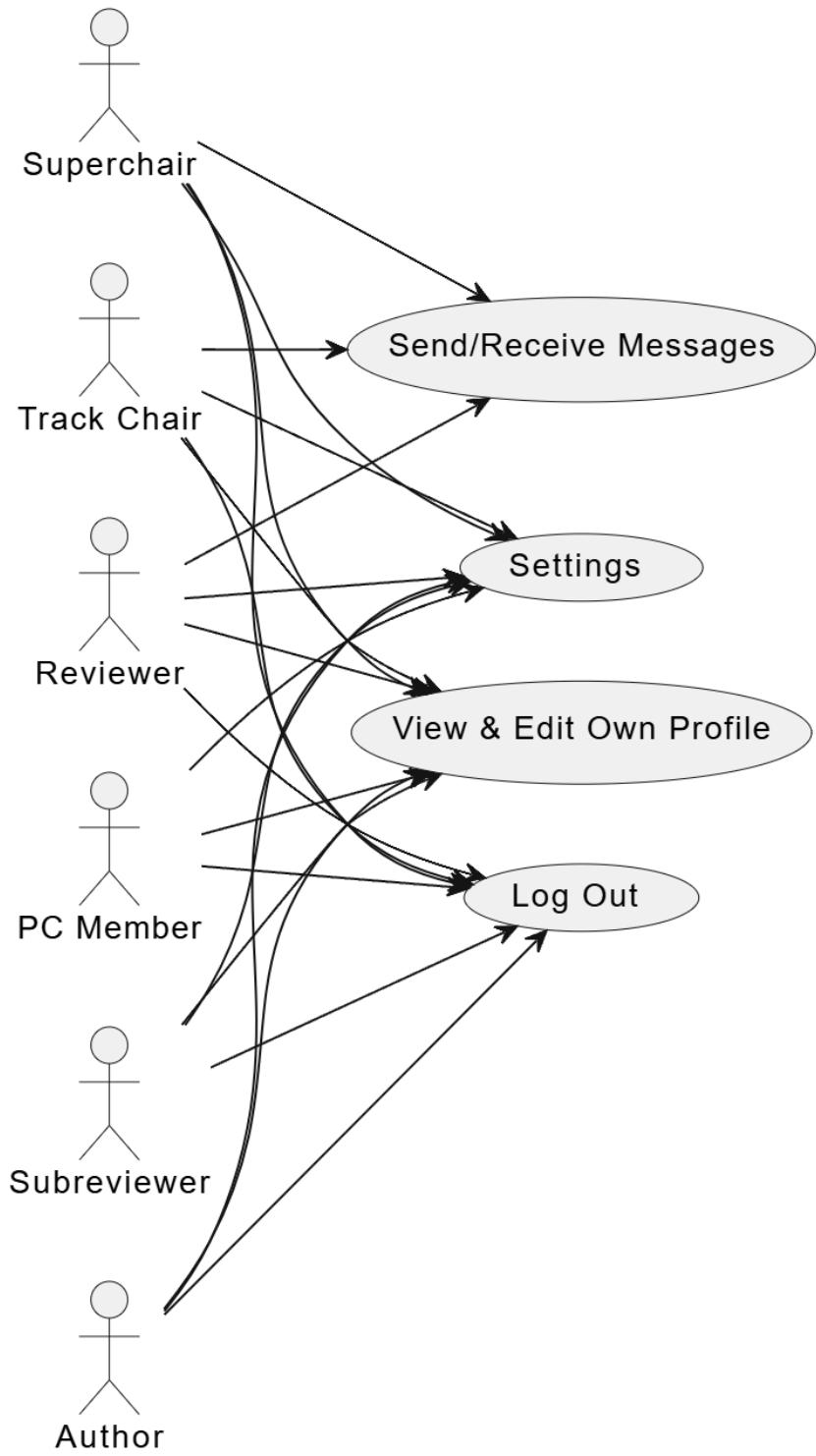


Diagram 4: Use Case Diagram for General Settings and Interaction

3.5.3. Object and Class Model

We rotated it in order to be able to put it here in a better way.

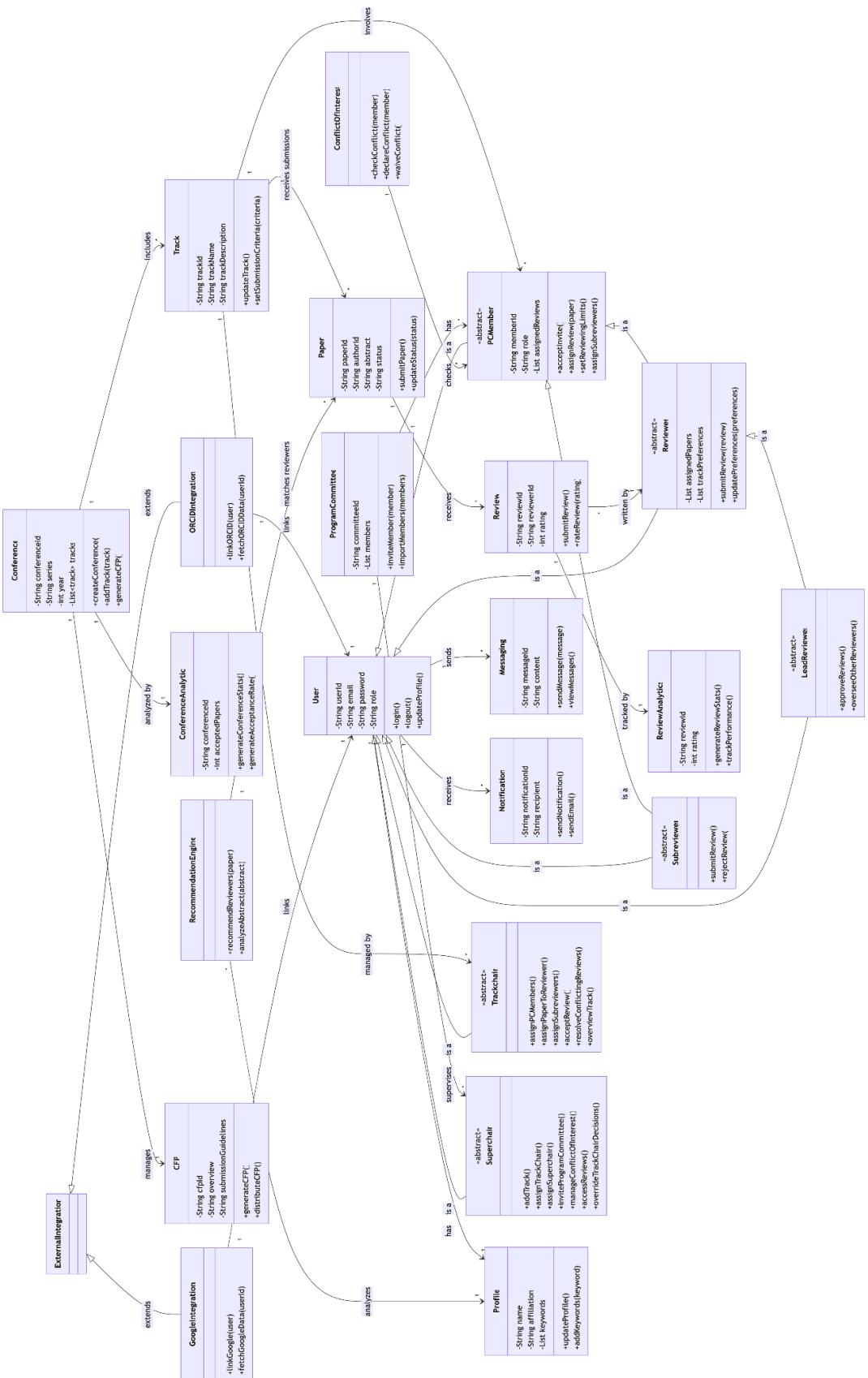


Diagram 5: Class Diagram

3.5.4. Dynamic Models

3.5.4.1. Sequence Diagram

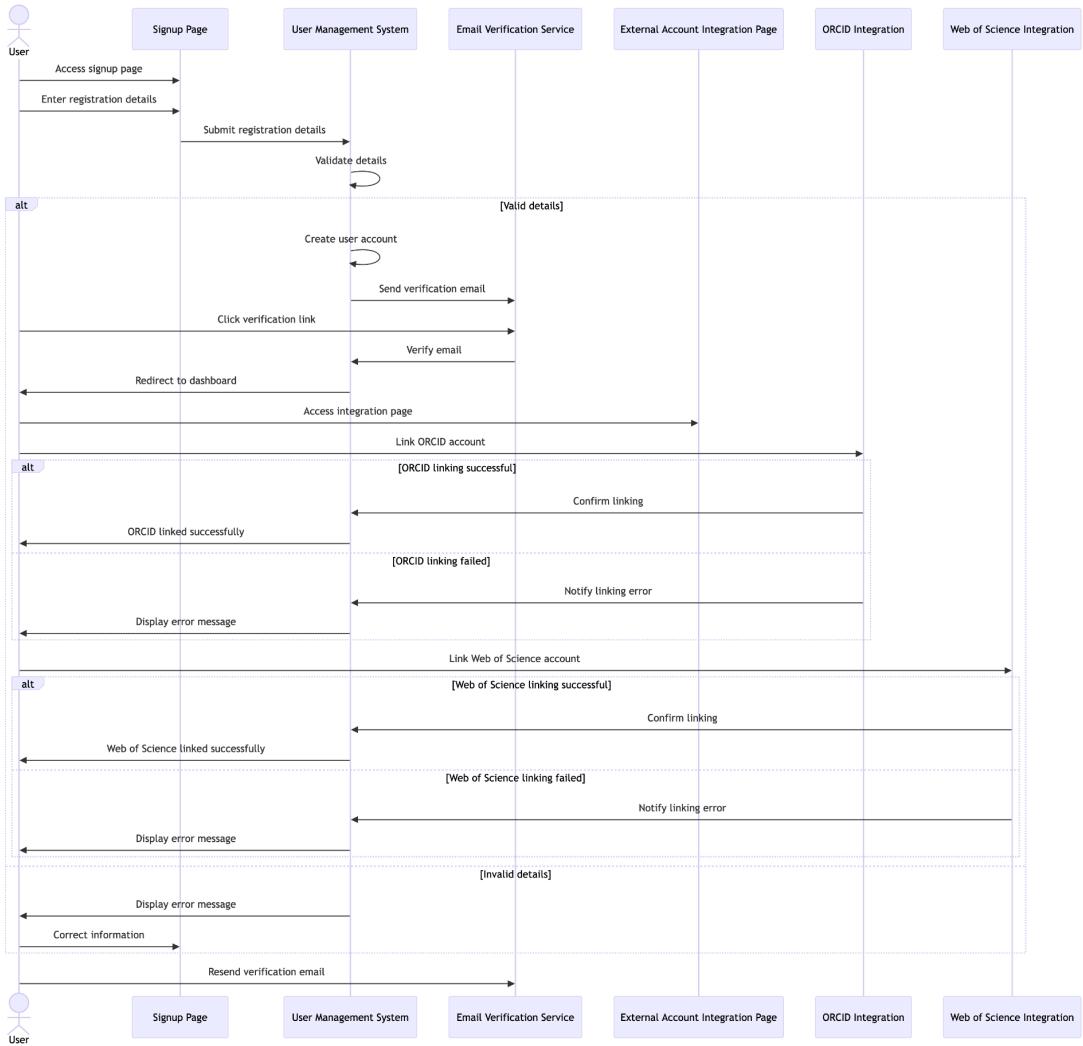


Diagram 6: User Signup and External Integrations

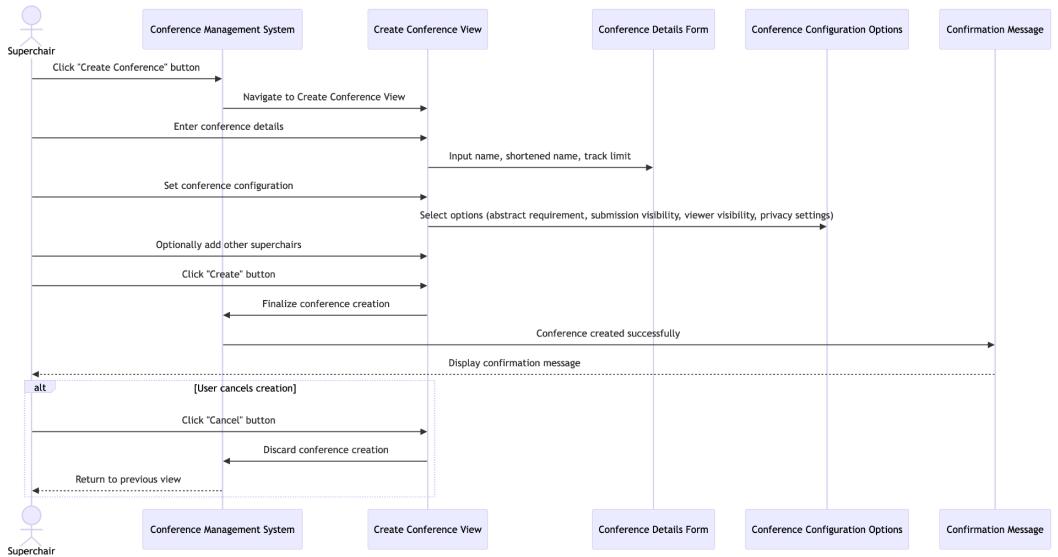


Diagram 7: Create New Conference

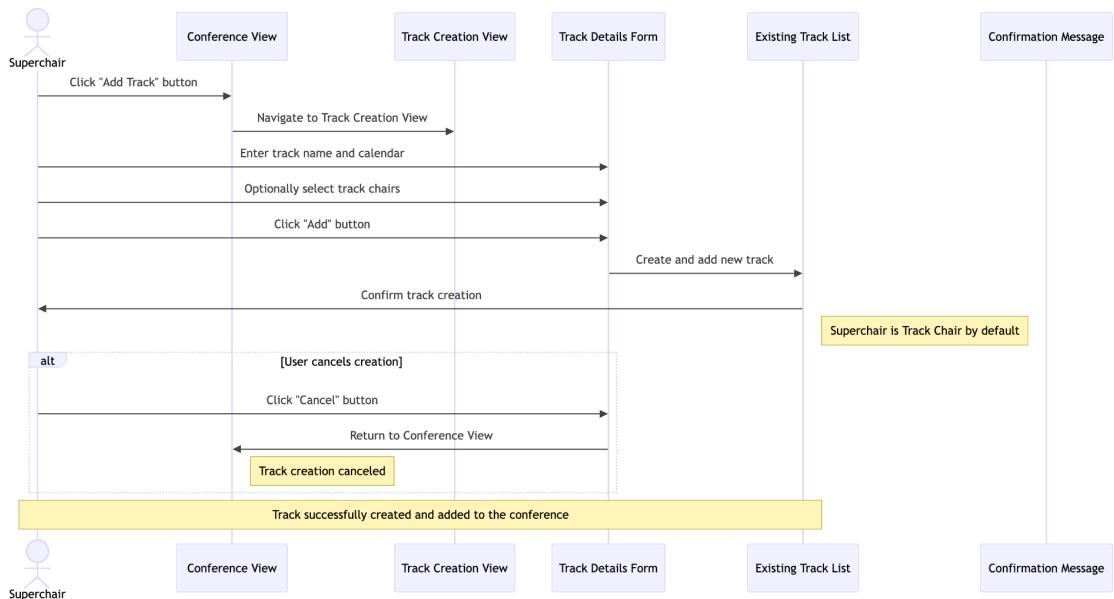


Diagram 8: Create New Track

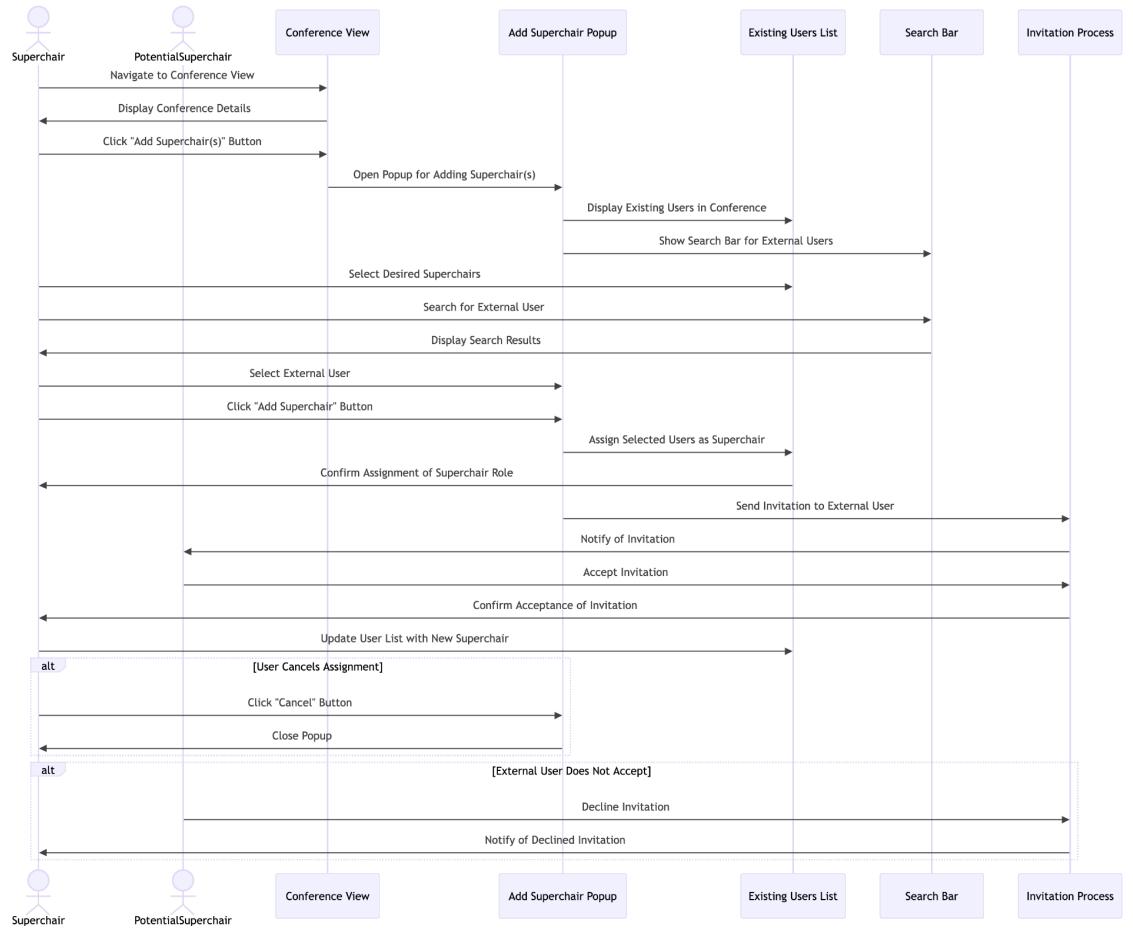


Diagram 9: Assign Superchair

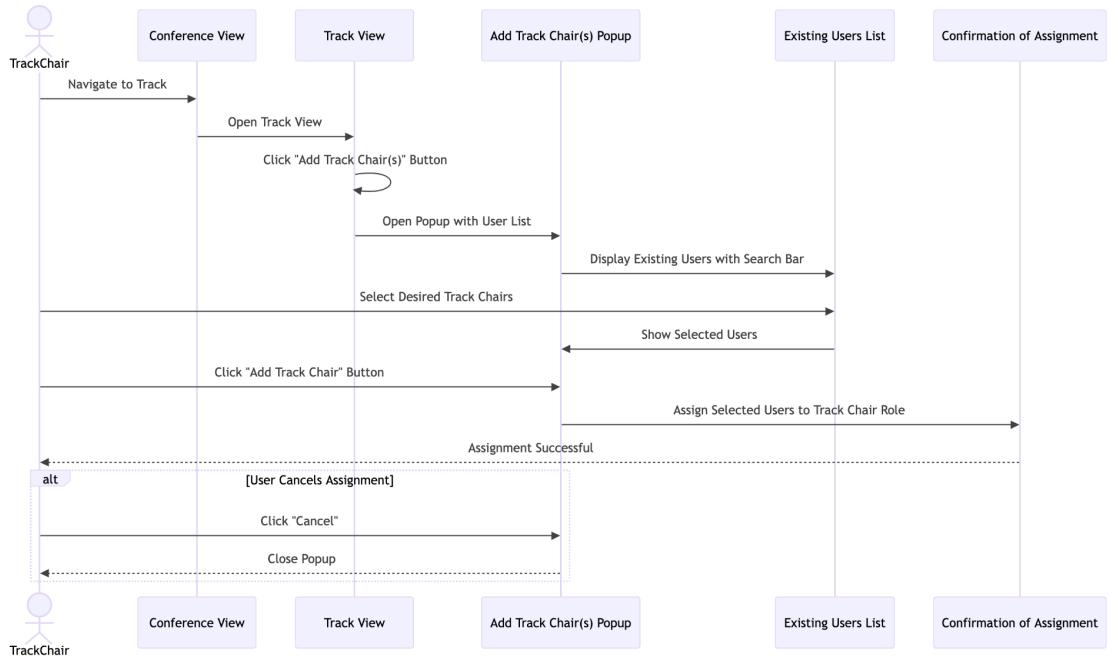


Diagram 10: Assign Trackchair

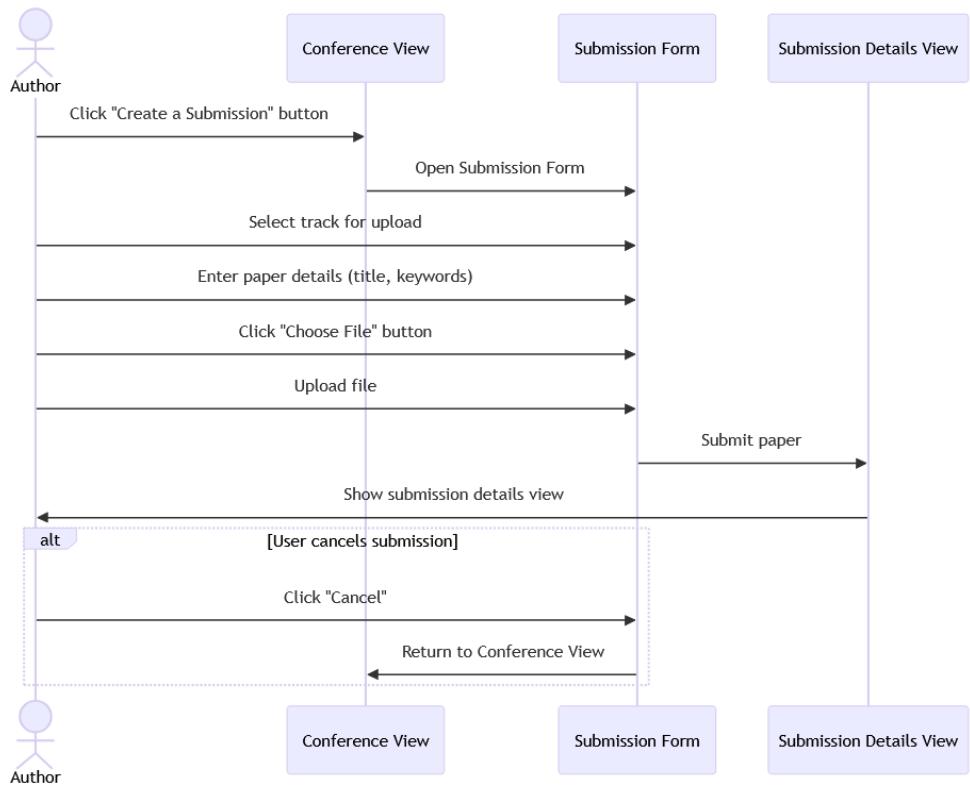


Diagram 11: Create a submission

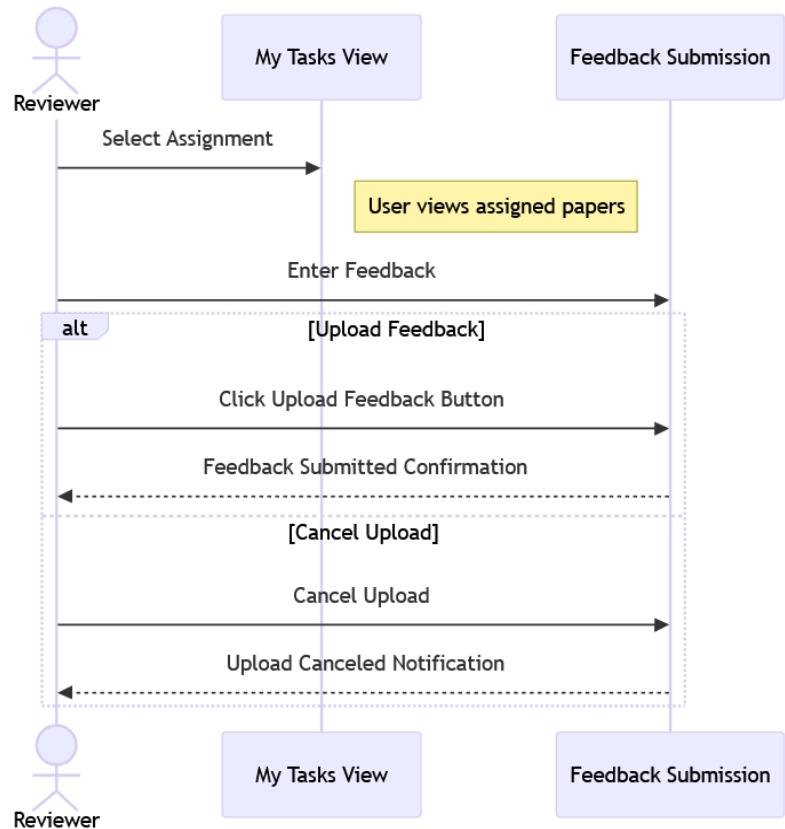


Diagram 12: Give feedback to assigned paper

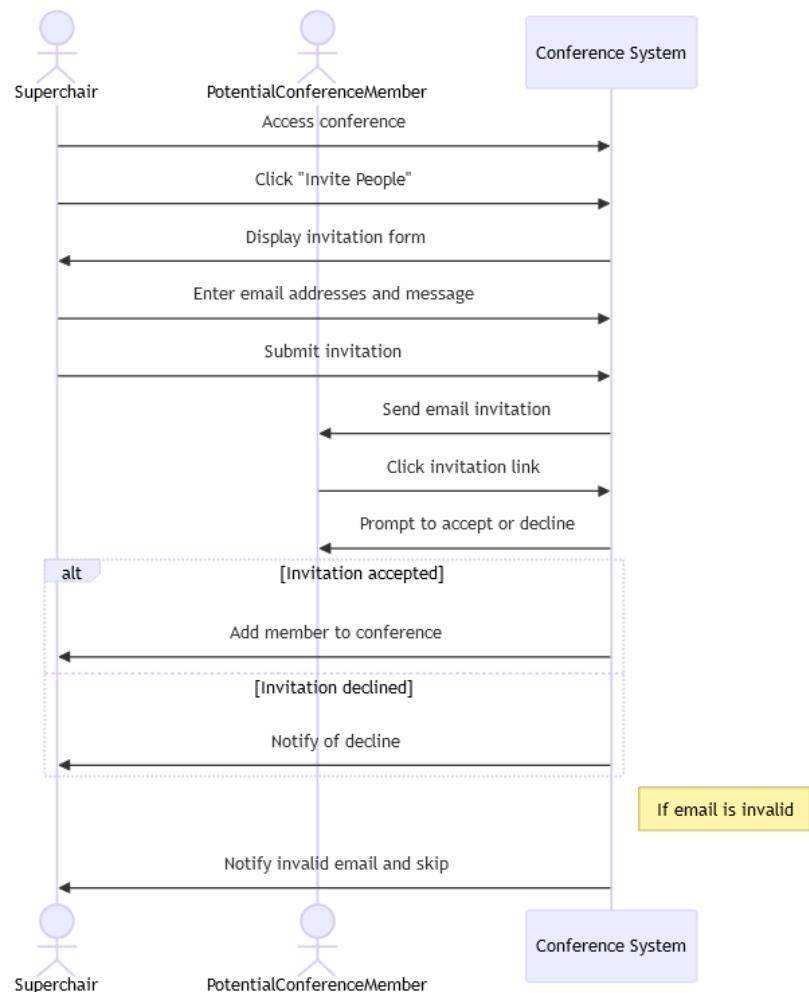


Diagram 13: Sending Invitations to Potential Conference Members

3.5.4.2. State Diagrams

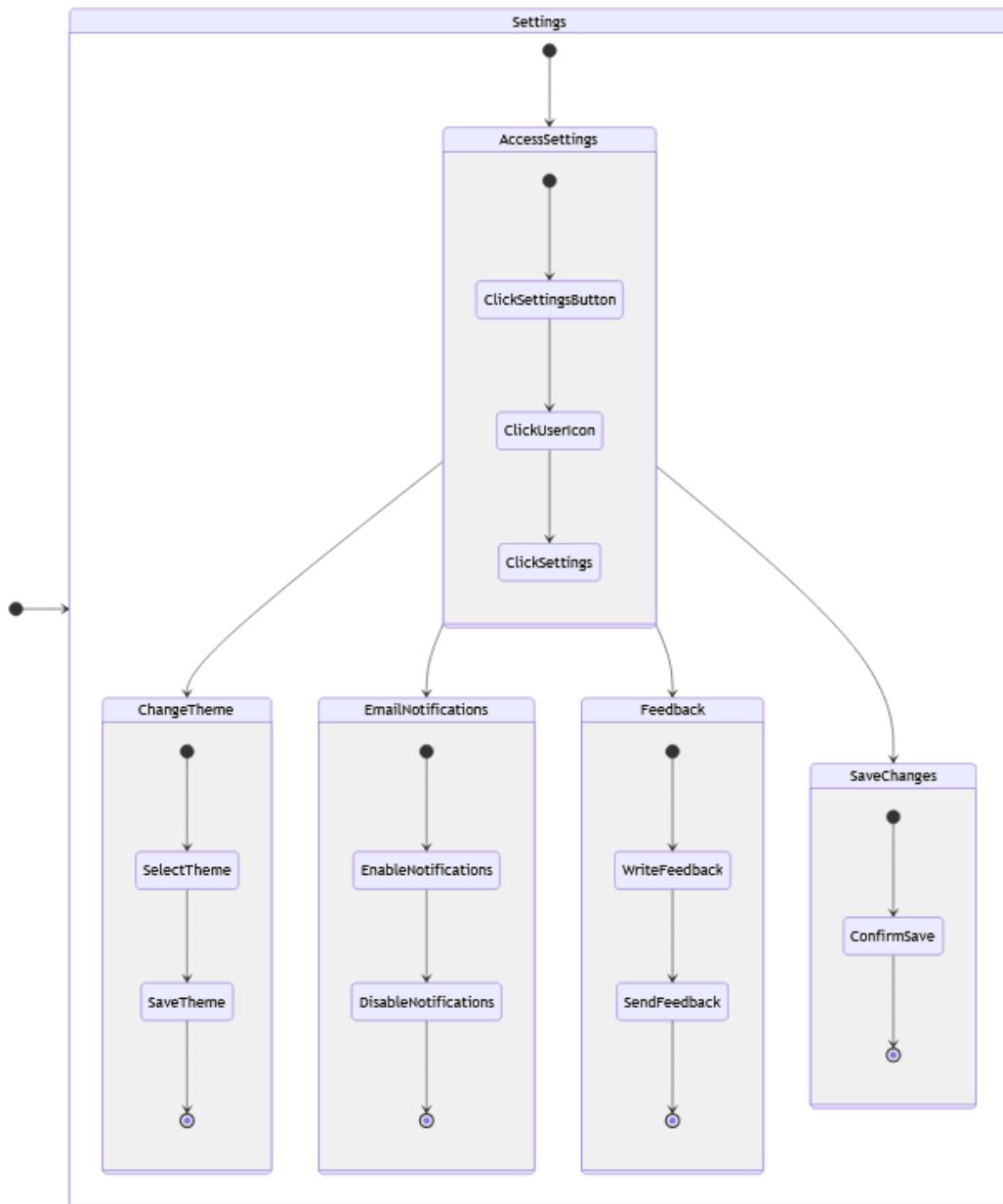


Diagram 14: Settings

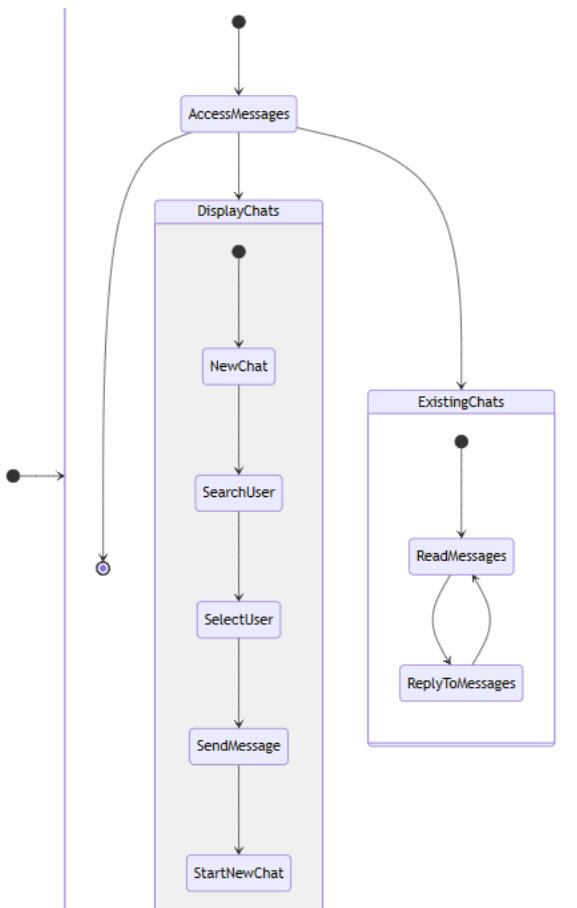


Diagram 15: Send/receive message

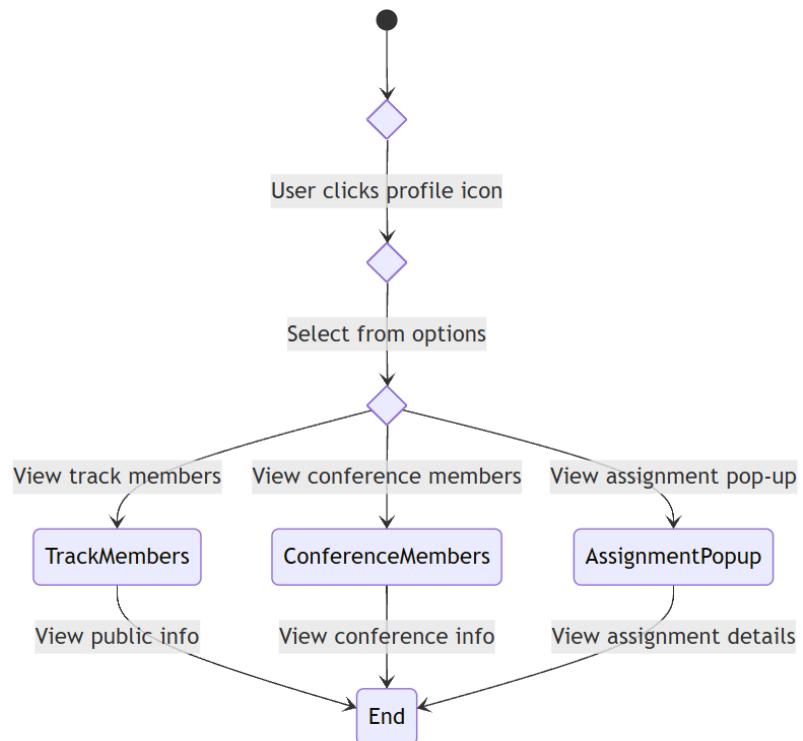
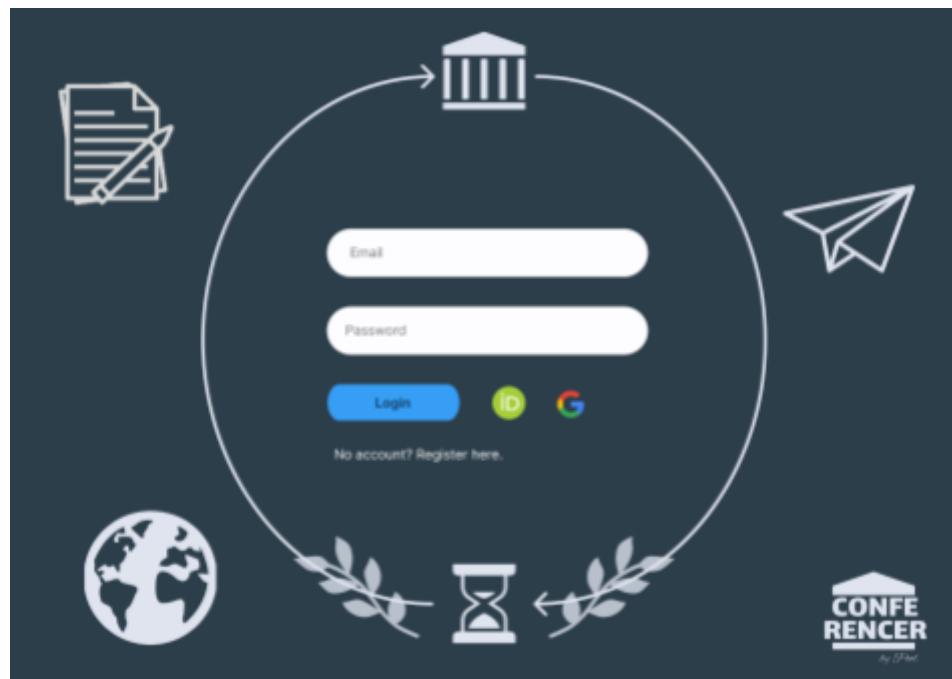


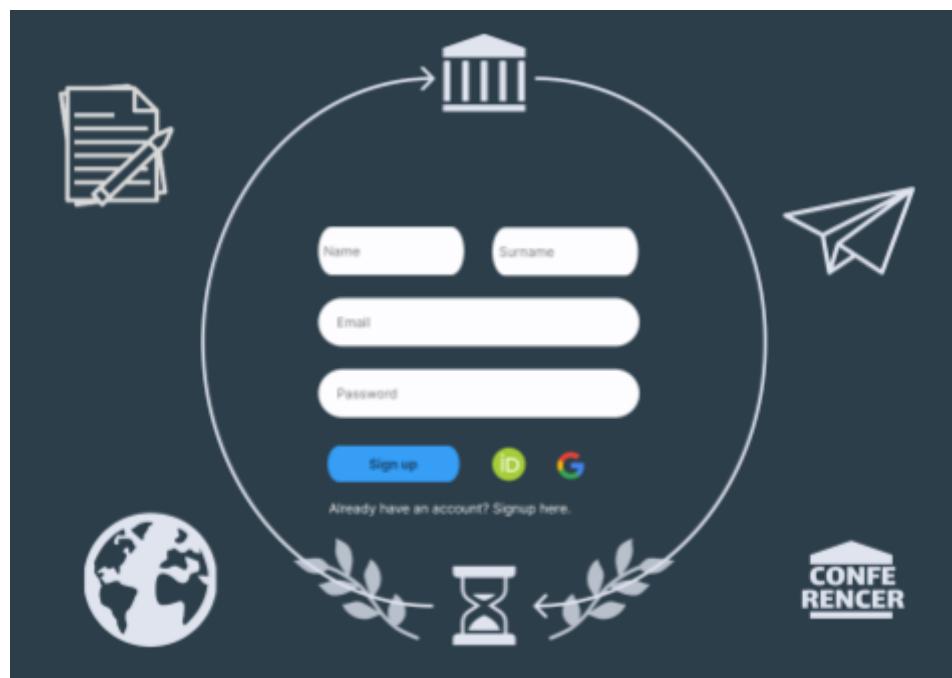
Diagram 16: View the Profile of a User

3.5.5. User Interface

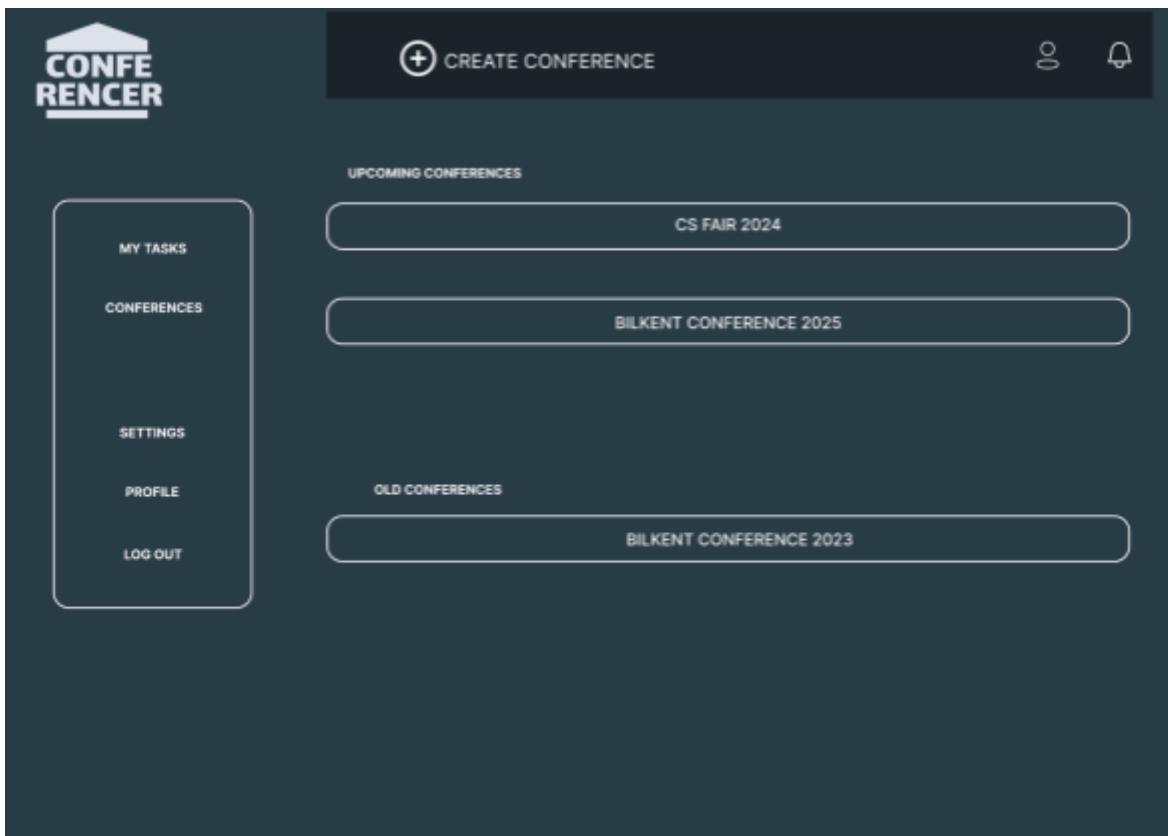
The UI elements presented in this section represent the initial design of our interface. Please note that while the layout and functionality will remain consistent, the theme color and certain design details may change in future versions to enhance user experience or align with updated branding guidelines. Additionally, some pages and/or functionalities may be adjusted or removed in future iterations.



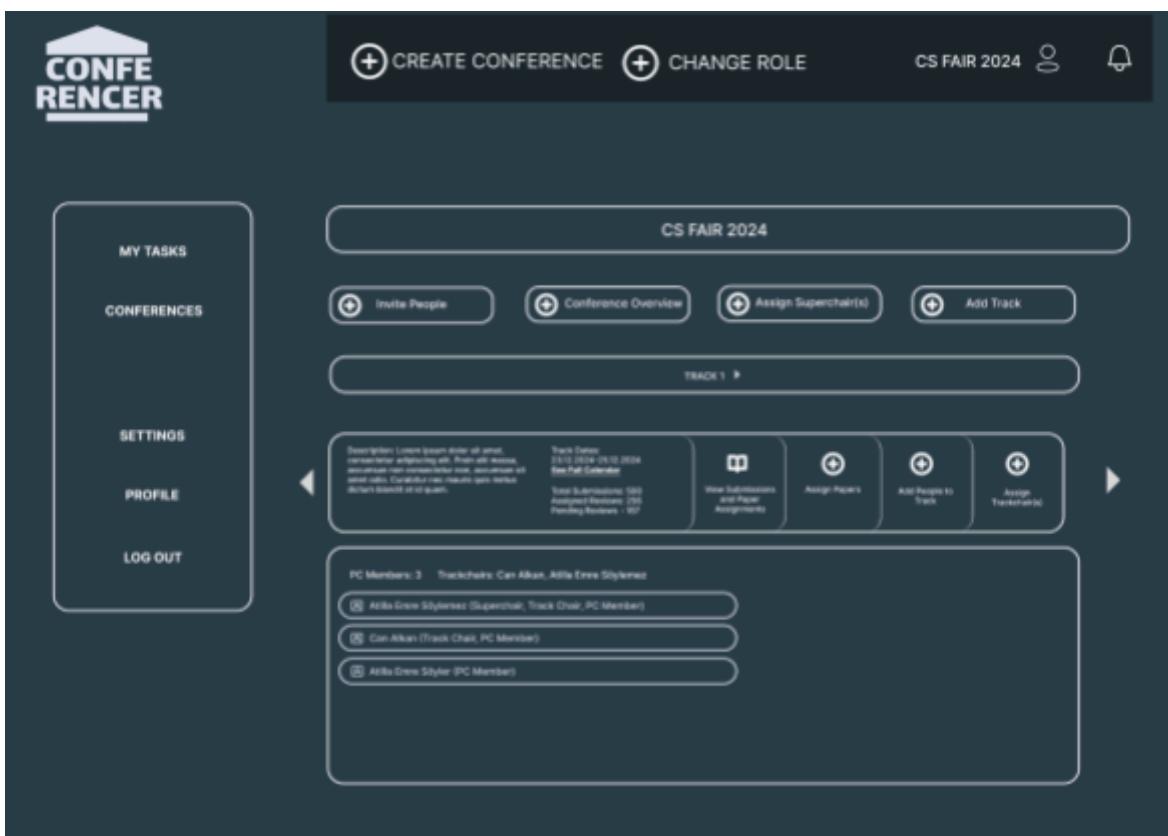
Page 1: Login Page



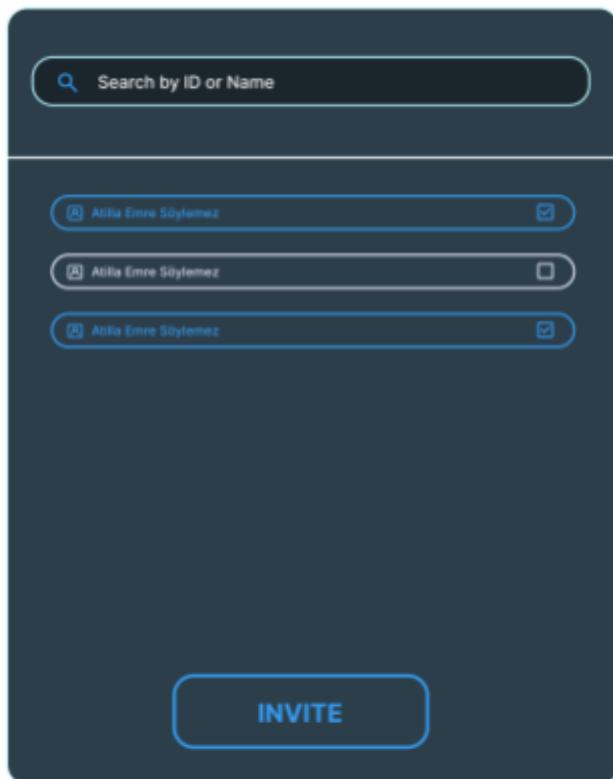
Page 2: Register Page



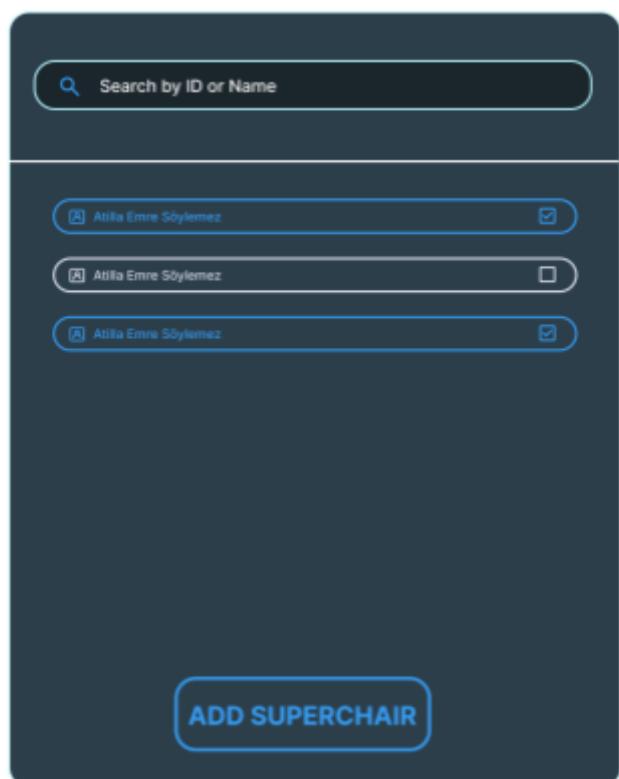
Page 3: User Main Page



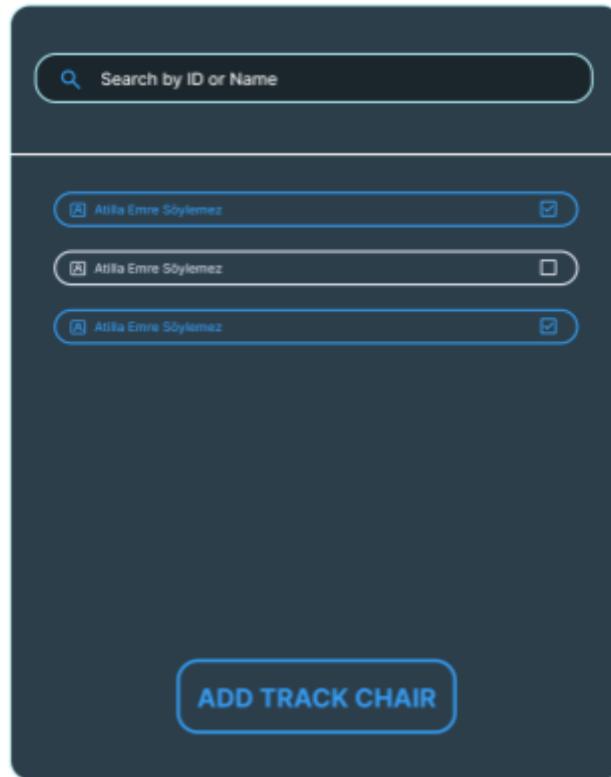
Page 4: Conference (Superchair)



Page 4: Invite People Pop-up



Page 4: Add Superchair Pop-up



Page 4: Add Track Chair Pop-up



Page 4: Assign Paper Pop-up



Page 4: Assign Paper Pop-up Continue

CONFERENCE RENCER

CREATE CONFERENCE **CHANGE ROLE** CS FAIR 2024

Configure Conference Switch Back to Track View

CS FAIR 2024: Overview

Superchair(s): Berkay Ayçicek, Can Alkan

Description: Lorem ipsum dolor sit amet, consectetur adipiscing elit. Proin elit massa, accumsan non consectetur non, accumsan sit amet odio. Curabitur nec mauris quis metus dictum blandit at id quam.

Date: 12.12.2012 - 11.11.2011 [See Full Schedule](#)

Participants: 308 [Invite More](#)

Submissions: 498 [View](#)

Track Count: 3

click on tracks to switch to track view.

TRACK1 Chair(s): Berkay Ayçicek, Can Alkan, Ahmet Memduh Tel...	Configure track
Submissions: 10 PC Members: 27 Pending/Assigned Reviews: 11/14	Configure track
TRACK2 Chair(s): Ahla Erkut Şipermez, Can Alkan, Ahmet Memduh Tel...	Configure track
Submissions: 60 PC Members: 27 Pending/Assigned Reviews: 32/56	Configure track
TRACK3 Chair(s): Ahla Erkut Şipermez, Can Alkan, Ahmet Memduh Tel...	Configure track
Submissions: 90 PC Members: 27 Pending/Assigned Reviews: 42/84	Configure track

Page 5: Conference Overview (Superchair)

The screenshot shows the CONFERENCE platform's paper submission interface. At the top, there is a navigation bar with the logo "CONFERENCE", "PAPER SUBMISSION", "CHANGE ROLE", "CS FAIR 2024", and user icons. On the left, a sidebar contains "MY TASKS", "CONFERENCES", "SETTINGS", "PROFILE", and "LOG OUT". The main area is titled "Paper Submission" and features a "Current Submissions" section with a table showing two entries:

#	Authors	Title	Keywords	track	Date	Paper
1	Berkay Aycılok	Computer Graphics	Graphics, Ray, 3d	Computer Science	Dec 3, 17:00-GMT	paper1.pdf
2	Berkay Aycılok, Alia Soylemez	Machine Learning	Artificial, Intelligence, machine	Machine Learning	Dec 2, 17:00-GMT	paper2.pdf

For each entry, there are three buttons: "Edit Paper", "Delete Paper", and "Change track". Below this is a "Deleted Submissions" section with a single entry:

#	Authors	Title	Keywords	track	Date	Paper
1	Berkay Aycılok	Computer Networks	ethernet, lan, network	computer science	Dec 3, 17:00	paper3.pdf

Page 6: Paper Submission (Author)

The screenshot shows the CONFERENCE platform's "Add Submission" page. At the top, there is a navigation bar with the logo "CONFERENCE", "PAPER SUBMISSION", "CHANGE ROLE", "CS FAIR 2024", and user icons. The main area is titled "Add Submission" and features a "Select Track" section with radio buttons for "Computer Science" (selected) and "Machine Learning". Below this is a form for "Author 1" with fields for First Name, Last Name, Email, Country, Organization, and a checkbox for "Email Notifications". There is also a button to "Add author". The form continues with sections for "Title" (Computer Graphics), "Abstract" (Random), and "Keywords" (a, b, c). At the bottom, there is a file upload field with the placeholder "Choose file" and the message "No file chosen".

Page 7: Add Submission (Author)

The screenshot shows the 'Submission details' page after a successful submission. At the top, there are navigation links for 'PAPER SUBMISSION' and 'CHANGE ROLE'. On the right, there are icons for 'CS FAIR 2024', a user profile, and a notification bell. Below the header, a message says 'Successfully submitted!' followed by a table of author information:

Authors	Email	Country	Organization	email notifications
Berkay Ayıcıok	sample1@hotmail.com	Turkey	Bilkent University	✓
Atila Soylmez	sample2@hotmail.com	Turkey	Bilkent University	✗

Below the authors table is another table containing submission metadata:

Track:	Computer Science
Paper:	paper-v1.pdf
Title:	Computer Graphics
Abstract:	Summary
Keywords:	ray, shading, 3d
Submission Date:	Dec 3, 08:13 GMT
Last Update Date:	Dec 3, 08:13 GMT

At the bottom left, there is a 'Return Submissions' button.

Page 8: Submission Details (Author)

The screenshot shows the 'Your Reviews' page. At the top, there are navigation links for 'MY REVIEWS' and 'CHANGE ROLE'. On the right, there are icons for 'CS FAIR 2024', a user profile, and a notification bell. A sidebar on the left lists 'MY TASKS', 'CONFERENCES', 'SETTINGS', 'PROFILE', and 'LOG OUT'.

Your Reviews

Not Reviewed Papers

#	Authors	Title	Keywords	track	Date	Paper	Decision
1	Berkay Ayıcıok	Computer Graphics	Graphics, Ray, 3d	Computer Science	Dec 3, 17:00-GMT	paper1.pdf	
2	Berkay Ayıcıok, Atila Soylmez	Machine Learning	Artificial, Intelligence, Machine	Machine Learning	Dec 2, 17:00-GMT	paper2.pdf	

Reviewed Papers

#	Authors	Title	Keywords	track	Date	Paper	Decision	Review	Confidence
1	Berkay Ayıcıok	Computer Networks	ethernet, link, network	computer science	Dec 3, 17:00	paper1.pdf	reject -1	reviewer-1.pdf	3

Page 9: Review Page (PC)

Make Review

Not Reviewed Papers

#	Authors	Title	Keywords	Track	Date	Paper	Decision	Confidence score
1	Berkay Aydogdu	Computer Graphics	Graphics, Ray, 3D	Computer Science	Dec 3, 17:30 GMT	sample.pdf	reject -1	3 neutral 0 reject -1

Reviewer details

PC Member (Chair): Ali Er
Subreviewer information (optional)

First name: Ahmet
Last Name: Ergen
Email: sample@hotmail.com

Add review as text

Review: Description: Lorem ipsum dolor sit amet, consectetur adipiscing elit. Proin elit massa, accumsan non consectetur non, accumsan sit amet odio. Curabitur nec mauris quis metus dictum blandit id quam.

Add review as txt file (optional)

Choose file
No file chosen

Buttons: Complete Review, Cancel

Page 10: Make Review (PC)

CREATE CONFERENCE

Create Conference

Conference information

Conference name	Bilkent
Short conference name	bil
Country	Turkey
City	Ankara
Submission webpage	http://conferences/conference/bil
Contact email	sample@hotmail.com
Track limit	2

Access information

Anonymous submission	no
Can PC/Reviewer see all submissions	no

Submission information

Abstract requirement	yes
Maximum length for abstract	no
Multiple authors allowed	yes
Select presenter requirement	no
File format requirement	pdf
New Submission allowed	no
Submission update allowed	yes

Paper bidding and assignment

Paper bidding enabled	no
Viewing bids of PC member by chairs enabled	no
Number of reviewer per paper	5

Reviewing information

Can PC see reviewer's names	no
Status menu enabled	yes
Permit PC members to enter review	no
Can ordinary PC members access reviews	only the review of the papers assigned to them
Decision range (only even numbers)	10 (meaning -5 to 5)
Number of reviewer per paper	5
Track chairs can send notifications and/or reviews to the track authors	no

Buttons: Create Conference

Page 11: Create Conference

Conference information

Conference name	Bilkent
Short conference name	bil
Country	Turkey
City	Ankara
Submission webpage	http://conferenceroad.com/conference/bil
Contact email	samplet@hotmail.com
Track limit	2

Access information

Anonymous submission	no
Can PC/reviewer see all submissions	no

Submission information

Abstract requirement	yes
Maximum length for abstract	no
Multiple authors allowed	yes
Select presenter requirement	no
File format requirement	.pdf
New submission allowed	no
Submission update allowed	yes

Paper bidding and assignment

Paper bidding enabled	no
Viewing bids of PC member by chains enabled	no
Number of reviewer per paper	5

Reviewing information

Can PC see reviewer's names	no
Status menu enabled	yes
Permit PC members to enter review	no
Can ordinary PC members access reviews	only the reviews of the papers assigned to them
Decision range (only even numbers)	10 (meaning -5 to 5)
Number of reviewer per paper	5
Track chairs can send notifications and/or reviews to the track authors	no

Apply Configurations

Page 12: Configure Conference (Superchair)

Conference information

Conference name	Bilkent
Short conference name	bil
Country	Turkey
City	Ankara
Submission webpage	http://conferenceroad.com/conference/bil
Contact email	samplet@hotmail.com
Track limit	2

Track information

Track Name	Computer Science
Track chairs	Berkay Aydogan, Ali Er
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Submission information

Abstract requirement	yes
Maximum length for abstract	no
Multiple authors allowed	yes
Select presenter requirement	no
File format requirement (.pdf or no)	.pdf
New submission allowed	no
Submission update allowed	yes

Access information

Anonymous submission	no
Can PC/reviewer see all submissions	no

Paper bidding and assignment

Paper bidding enabled	no
Viewing bids of PC member by chains enabled	no
Number of reviewer per paper	5

Reviewing information

Can PC see reviewer's names	no
Status menu enabled	yes
Permit PC members to enter review	no
Can ordinary PC members access reviews	only the reviews of the papers assigned to them
Decision range (only even numbers)	10 (meaning -5 to 5)
Number of reviewer per paper	5
Track chairs can send notifications and/or reviews to the track authors	no

Apply Configurations

Page 13: Configure Track (Superchair)

4. Other Analysis Elements

4.1. Consideration of Various Factors in Engineering Design

4.1.1. Constraints

4.1.1.1. Implementation Constraints

- The system will operate as a web application.
- For the front-end development, React with TypeScript will be used.
- Java Spring Boot will be used to implement the business logic and RESTful APIs for the backend development.
- Maven will be used to manage dependency and automate project builds.
- PostgreSQL will serve as the primary relational database for data storage.
- The application will be deployed on AWS for cloud-based services.
- Docker will be used for containerization, enabling consistent environments across development, testing, and production.
- Docker-compose will be used for orchestration of containers.
- Google OAuth 2.0 and ORCID will be used as login/register options.

4.1.1.2. Economic Constraints

- The software dependencies on the system are free to use.
- If needed, payments may be made to AWS; however, the costs will be minimized.
- One of the group members has a Linux VPS, and it may be used for deployment.

4.1.1.3. Ethical Constraints

- Users' personal data will be collected, processed, and stored securely.
- The purpose of data collection and system processes will be explained clearly to the users.
- Users will have the ability to review, edit or delete their personal information.
- Privacy regulations such as GDPR and KVKK will be complied with.
- The project complies with the General Data Protection Regulation (GDPR), ensuring users can access, modify, or delete their data securely [2].
- Submitted papers will be protected from unauthorized access to prevent plagiarism.
- The system will avoid conflicts of interest for the authors and reviewers in the review assignment process.

4.1.2. Standards

The project adheres to the following standards:

- **Software Development:** ISO/IEC 12207 for lifecycle processes, IEEE 1012 for verification and validation.
- **Data Privacy:** GDPR and KVKK for personal data protection, ISO/IEC 27001 for information security. The project employs ISO/IEC 27001:2013 to implement an information security management system, addressing confidentiality, integrity, and availability of data [3].
- **Web Application:** WCAG 2.1 for accessibility, RESTful API conventions for interoperability.
- **Coding:** Java SE 17 and React best practices for maintainable development.
- **Database:** ISO SQL standards and ACID compliance for reliable PostgreSQL operations.
- **Cloud Deployment:** AWS Well-Architected Framework and Docker containerization for scalable deployment.
- **Ethics:** ACM and IEEE Codes of Ethics to ensure fairness, integrity, and user trust.

4.2. Risks and Alternatives

Risk	Likelihood	Effect on the Project	Alternative
LLM Fraud Detection Complexity	High	Failure to implement effective AI-detection could result in incomplete functionality or poor performance.	Remove this feature.
Budget Limitations for AWS	Medium	Inability to test and deploy on AWS fully, affecting scalability and performance testing.	Use Bilal's VPS
User Experience (UX) Challenges	Medium	Negative feedback from stakeholders, requiring additional development cycles to improve usability.	Create prototypes in Figma and test with target users early in the process.
Security Breaches	Low	Unauthorized access could lead to data leaks, harming reputation and compliance.	Implement strong authentication protocols.
API Rate Limits	Medium	Delays in implementing features relying on external APIs due to	Optimize API usage to reduce calls.

		exceeded rate limits.	
Data Loss or Corruption	Low	Loss of critical project files or data, causing rework and delays.	Use version control (e.g., Git) and automated daily backups.

4.3. Project Plan

Project Goals

The primary goals of this project are:

1. Develop a fully functional and integrated system that meets the requirements outlined in the analysis phase.
2. Ensure usability by providing an intuitive and user-friendly UI/UX design.
3. Deliver reliable back-end services with optimized performance and security.
4. Facilitate seamless integration between front-end, back-end, and database components.
5. Conduct thorough testing for functionality, performance, and security.
6. Create comprehensive documentation for system usage, APIs, and deployment.
7. Deploy a stable and live version of the system and monitor its performance.

1	Requirement Analysis	Ahmet, Bilal	Berkay	19/10/2024	10/12/2024	Analysis and Requirements Document
2	UI Design Completion (Figma)	Berkay	Atilla	01/11/2024	31/12/2024	Complete UI Design Mockups
3	Functional Design of the System	Bilal	Ahmet	01/11/2024	07/02/2025	Functional Design Document
4	System Architecture Design	Atilla, Berkay	Ahmet	14/11/2024	13/12/2024	High-Level System Design Document
5	Authentication and Authorization Implementation	Berkay	Bilal	15/11/2024	01/02/2025	Authentication and Authorization Modules
6	Back-End API Development	Ahmet	Bilal	15/11/2024	23/04/2025	Java Spring Boot APIs

7	Front-End Development	Berkay	Atilla	30/11/2024	23/04/2025	UI Components, React Front-End
WP #	Work Package Name	Team Members	Leader	Start Date	End Date	Deliverables
8	Automated Review Assignment	Atilla	Berkay	01/02/2025	19/02/2025	Review Assignment Engine
9	Database Design and Integration	Ahmet, Berkay	Bilal	01/02/2025	26/03/2025	PostgreSQL Schema and Data Models
10	User Documentation	Berkay	Atilla	01/02/2025	05/04/2025	User Manual
11	Conflict-of-Interest Module	Ahmet	Bilal	06/03/2025	26/03/2025	Conflict Detection Algorithms
12	Deployment Preparation	Ahmet	Bilal	18/03/2025	06/04/2025	Deployment Scripts
13	Front-End and Back-End Integration	All Members	Ahmet	25/03/2025	23/04/2025	Integrated System
14	System Deployment	All Members	Ahmet	08/04/2025	26/04/2025	Live System
15	System Testing and Debugging	All Members	Berkay	13/04/2025	05/05/2025	Tested and Debugged System
16	LLM-Generated Review Detection	Bilal	Ahmet	?	?	NLP Detection Module

Objectives and Milestones

1. WP1 - UI Design Completion (Figma)

- **Objective:** Complete UI/UX design for the system.
- **Milestone:** Finalize all UI mockups in Figma by February 7, 2025.
- **Deliverables:** Complete UI Design Mockups.

2. WP2 - Functional Design of the System

- **Objective:** Define the functional specifications for the system, including major workflows.
- **Milestone:** Functional design report approved and ready by February 7, 2025.
- **Deliverables:** Functional Design Document.

3. WP3 - Authentication and Authorization Implementation

- **Objective:** Implement secure authentication and authorization mechanisms.
- **Milestone:** Completion of user login, registration, and role-based access control by February 1, 2025.
- **Deliverables:** Authentication and Authorization Modules.

4. WP4 - Requirement Analysis

- **Objective:** Gather and document all functional and non-functional requirements.
- **Milestone:** Finalize and submit the analysis and requirements document by February 1, 2025.
- **Deliverables:** Analysis and Requirements Document.

5. WP5 - System Architecture Design

- **Objective:** Design the high-level system architecture.
- **Milestone:** Deliver system architecture diagrams and high-level design documents by February 7, 2025.
- **Deliverables:** High-Level System Design Document.

6. WP6 - Database Design and Integration

- **Objective:** Design and integrate the PostgreSQL database.
- **Milestone:** PostgreSQL schema and data models implemented by March 1, 2025.
- **Deliverables:** PostgreSQL Schema and Data Models.

7. WP7 - Front-End Development

- **Objective:** Develop the React front-end for the system.
- **Milestone:** Completion of all UI components and integration by April 1, 2025.
- **Deliverables:** UI Components, React Front-End.

8. WP8 - Back-End API Development

- **Objective:** Develop robust back-end APIs using Java Spring Boot.
- **Milestone:** Finalize API endpoints and ensure integration with the front-end by April 1, 2025.
- **Deliverables:** Java Spring Boot APIs.

9. WP9 - Conflict-of-Interest Module

- **Objective:** Implement conflict detection algorithms.
- **Milestone:** Complete and validate conflict detection algorithms by March 10, 2025.
- **Deliverables:** Conflict Detection Algorithms.

10. WP10 - Automated Review Assignment

- **Objective:** Develop an automated review assignment engine.
- **Milestone:** Functional review assignment engine delivered by March 15, 2025.

- **Deliverables:** Review Assignment Engine.

11. WP11 - LLM-Generated Review Detection

- **Objective:** Implement NLP-based review detection using LLM.
- **Milestone:** Completion and testing of NLP detection module by April 1, 2025.
- **Deliverables:** NLP Detection Module.

12. WP12 - Front-End and Back-End Integration

- **Objective:** Integrate the front-end with the back-end services.
- **Milestone:** Achieve a fully integrated system by April 1, 2025.
- **Deliverables:** Integrated System.

13. WP13 - System Testing and Debugging

- **Objective:** Test system functionality, performance, and security.
- **Milestone:** Debugged and tested system ready by April 15, 2025.
- **Deliverables:** Tested and Debugged System.

14. WP14 - User Documentation

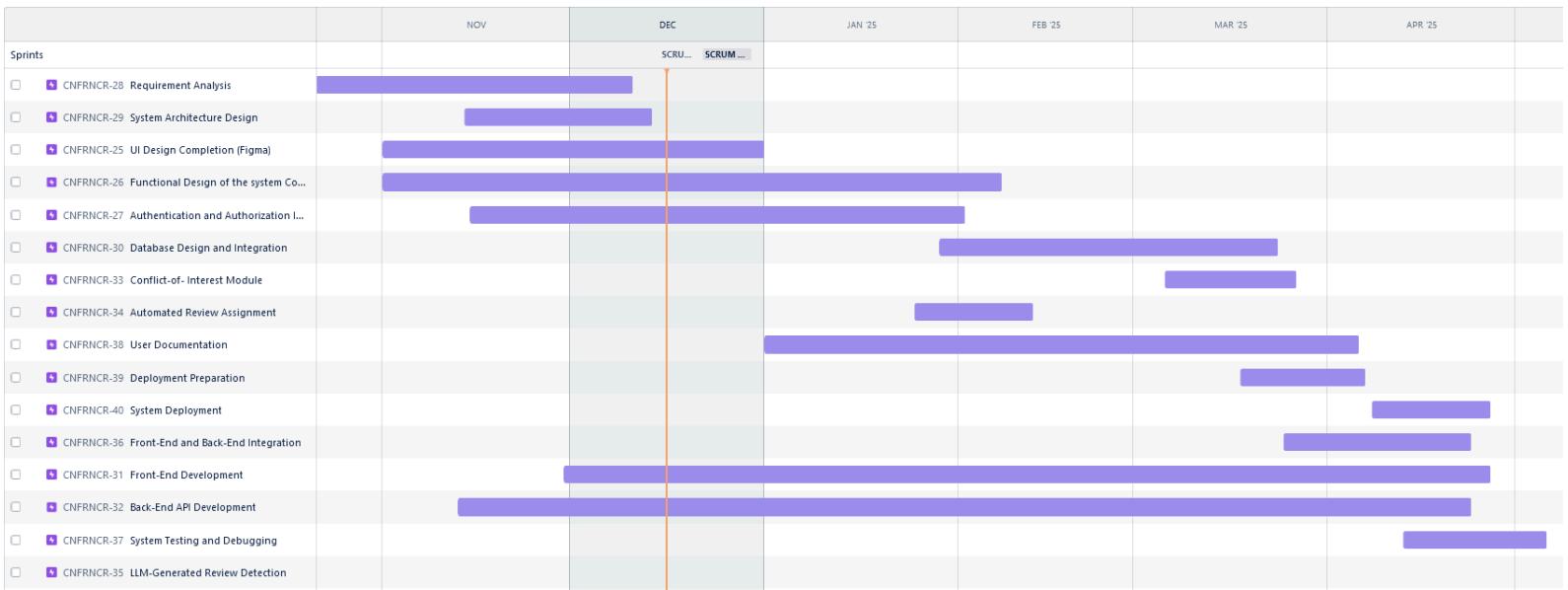
- **Objective:** Prepare user manuals and API documentation.
- **Milestone:** Completion of user documentation by May 1, 2025.
- **Deliverables:** User Manual.

15. WP15 - Deployment Preparation

- **Objective:** Prepare deployment scripts and perform deployment testing.
- **Milestone:** Deployment scripts finalized by May 1, 2025.
- **Deliverables:** Deployment Scripts.

16. WP16 - System Deployment

- **Objective:** Deploy the system live and ensure it runs smoothly.
- **Milestone:** Successfully deploy a stable system by May 5, 2025.
- **Deliverables:** Live System.



Key Milestones Summary

- **M1:** UI Mockups, Functional Design, and Authentication Modules Complete – February 7, 2025
- **M2:** System Architecture and Database Schema Finalized – March 1, 2025
- **M3:** Front-End, Back-End APIs, and Conflict Modules Completed – April 1, 2025
- **M4:** Fully Integrated System – April 1, 2025
- **M5:** System Testing, Debugging, and Documentation Finalized – April 15, 2025
- **M6:** Deployment Scripts Ready and System Deployed – May 5, 2025

4.4. Ensuring Proper Teamwork

Proper teamwork is essential for the success of our project, as it allows us to stay organized, productive, and focused despite the challenges of varying schedules and workloads. Our team consists of four Computer Science students, each bringing unique skills and perspectives to the project. To ensure effective collaboration, we rely on a combination of communication tools, task management strategies, and regular meetings.

We primarily use WhatsApp groups for day-to-day communication, as it provides a quick and convenient platform for sharing updates, asking questions, and coordinating tasks. For project management, we use Jira to track tasks, monitor progress, and manage deadlines, while GitHub serves as our central platform for version control and repository hosting. These tools help us maintain transparency and consistency throughout the development process.

In addition to using these tools, we meet regularly with our supervisor, the course instructors, and our innovation expert. These meetings provide valuable opportunities to discuss progress, address challenges, and receive guidance on both technical and strategic aspects of the project. The insights and feedback gained from these sessions play a crucial role in shaping the direction and quality of our work.

Task distribution within the team is guided by the expertise of individual members. Memduh and Bilal are responsible for assigning tasks to ensure an equitable distribution of workload while aligning tasks with the strengths of each team member. Memduh also manages the Jira workspace, ensuring that tasks are properly organized and that the team stays on track. These efforts help us maintain clear goals, foster accountability, and streamline our workflows.

By combining effective communication, structured task management, and regular meetings with key stakeholders, we have established a solid foundation for teamwork that supports the successful completion of our project.

Below you can find the screenshots from our Jira as well as our GitHub organization account, which includes our website and main repository.

The screenshot shows a project management application interface. At the top, there are navigation links: 'Projeler / Conferencer' and 'Konular'. Below this is a search bar and a toolbar with buttons for 'Paylaş', 'Konuları dışa aktar', 'Tüm konulara git', 'LİSTE GÖRÜNÜMÜ', 'AYRINTILI GÖRÜNÜM', and a three-dot menu. A secondary toolbar below includes 'Konuları arayın', 'Proje = Conferencer', 'Tür', 'Durum', 'Atanan', 'Daha fazlası +', 'Filtreyi kaydet', 'TEMEL', and 'JQL'.

The main area displays a list of tasks under 'Oluşturulan' (Created). One task is selected: 'Create event views: conference overview, View paper submissions, make paper assingments' (checkbox checked, 'AS' status). Other tasks include:

- Create main page view + top bar design on figma (checkbox checked, 'AS' status)
- dockerize the backend and database (checkbox checked, 'BK' status)
- set up ci cd using github actions (checkbox checked, 'BK' status)
- write signup and login in backend (checkbox checked, 'BK' status)
- complete backend setup tutorial (checkbox checked, 'MT' status)

A detailed view of the selected task shows its title, description, and status as 'Devam Ediyor'. It includes sections for 'Açıklama' (Description), 'Etkinlik' (Activity), and a comment section with a placeholder 'Bir yorum ekleyin...' (Add a comment...).

The screenshot shows a GitHub profile page for the organization 'Conferencer'. The profile picture is a logo with the text 'CONFERENCE' and 'by T.Bil'. The profile name is 'Conferencer' and the bio is 'Redefining the Conference Experience'. It has 3 followers and a public repository at <https://conferencer-bilkent.github.io/>. There is an 'Unfollow' button.

The 'Popular repositories' section shows two pinned repositories:

- conferencer-bilkent.github.io** (Public) - Description: Conferencer Main Repo. Languages: Java, Apache-2.0. Stars: 0. Forks: 0. Issues: 0. Last updated: 2 weeks ago.
- conferencer-bilkent.github.io** (Public) - Description: Conferencer Main Repo. Languages: Java, Apache-2.0. Stars: 0. Forks: 0. Issues: 0. Last updated: 3 weeks ago.

On the right side, there are sections for 'View as: Public', 'Discussions', and 'People'.

4.5. Ethics and Professional Responsibilities

4.5.1. Ethical Requirements

The system must prioritize data privacy and security by ensuring that all user data, including personal and conference-related information, is collected, processed, and stored securely in compliance with regulations such as GDPR and KVKK. Following the ACM Code of Ethics, the platform ensures transparency and fairness in data handling and decision-making processes [4]. Submitted papers must be safeguarded against unauthorized access to prevent plagiarism and misuse. Transparency is

essential, and the system must clearly communicate the purpose of data collection, storage, and processing to users while providing them with options to review, update, or delete their personal information. To ensure fairness and integrity, the platform should prevent conflicts of interest in the review process through automated conflict detection and anonymized reviewer and author identities where necessary. Accountability is also a critical aspect, and the system should maintain an audit trail of all actions, such as review assignments and decision-making processes, to ensure traceability. Finally, accessibility should be a guiding principle in the design, making the system inclusive for a diverse range of users, regardless of their technical expertise.

4.5.2. Professional Requirements

In this project, professional requirements are closely tied to ensuring effective collaboration and maintaining clear communication among all team members. To achieve this, the team has adopted Jira for task management and tracking progress. Jira facilitates an organized workflow by allowing the team to create, assign, and monitor tasks systematically. It also helps ensure accountability, enabling members to focus on their respective responsibilities while maintaining transparency about the project's overall status.

Additionally, professionalism demands adherence to established coding standards and best practices. This includes writing clear, maintainable code, conducting peer reviews, and documenting the system effectively to ensure long-term sustainability and ease of future enhancements. Ethical use of data and compliance with applicable regulations, such as GDPR, further underline the professional obligations that guide this project.

4.6. Planning for New Knowledge and Learning Strategies

To ensure the successful implementation of this project, we will adopt a structured approach to acquiring new knowledge and skills. The following strategies will be used:

1. Technical Skill Development

- **Workshops and Tutorials:** Team members will attend workshops and complete online tutorials on React, Java Spring Boot, and PostgreSQL to strengthen their understanding of the core technologies.
- **Documentation and Community Resources:** Official documentation, forums, and community guides will be utilized to stay updated on best practices and advanced features of the selected tools.

2. Domain Knowledge Acquisition

- **Research on Conference Management Systems:** We will analyze existing systems like EasyChair and OpenConf to understand common challenges and innovative solutions in the domain.
- **User Feedback and Case Studies:** By reviewing case studies of real conferences, we aim to identify user pain points and incorporate insights into our design.

3. Collaboration and Mentorship

- **Regular Check-ins with Supervisors:** Feedback from our supervisor and innovation expert will be integrated at every stage of development.
- **Peer Learning:** Team members will share individual learnings and insights during weekly meetings to ensure collective growth.

4. Adoption of Agile Methodologies

- **Incremental Learning:** The team will tackle new concepts in small, manageable increments, directly applying them to project milestones. This approach is inspired by the principles of the Agile Manifesto, which emphasize adaptability, iterative development, and collaboration to handle evolving project requirements efficiently [5].
- **Retrospectives:** Regular retrospectives will be conducted to evaluate what worked, what didn't, and what can be improved in learning strategies.

5. Problem-Specific Learning

- **LLM-Generated Review Detection:** We will explore research papers and tools related to natural language processing (NLP) to lay the groundwork for future implementation of automated review detection.
- **Conflict-of-Interest Algorithms:** Ethical and algorithmic solutions for automating conflict-of-interest detection will be studied to ensure fairness and transparency.

6. Knowledge Sharing Tools

- **Centralized Knowledge Repository:** A shared repository (Google Docs and Whatsapp Group) will be used to document all technical learnings, domain insights, and development practices for easy access.
- **Code Reviews:** Regular peer code reviews will serve as both a learning opportunity and a quality assurance measure.

5. Glossary

1 - GDPR: The **General Data Protection Regulation (GDPR)** is a data protection law enacted by the European Union to protect individuals' personal data and privacy. It sets rules for how organizations collect, use, and store personal information of people in the EU.

2 - KVKK: The **Kişisel Verilerin Korunması Kanunu (KVKK)** is the Turkish law for the protection of personal data, similar to the GDPR. It regulates how personal data should be processed, stored, and protected by organizations within Turkey. The law aims to ensure privacy and give individuals control over their personal data.

6. References

- [1] Amazon Web Services, "AWS Well-Architected Framework," 2020. [Online]. Available: <https://aws.amazon.com/architecture/well-architected/>. [Accessed: Dec. 14, 2024].
- [2] European Parliament, "General Data Protection Regulation (GDPR)," 2016. [Online]. Available: <https://gdpr-info.eu/>. [Accessed: Dec. 14, 2024].
- [3] ISO/IEC 27001:2013, "Information technology—Security techniques—Information security management systems," ISO, 2013. [Online]. Available: <https://www.iso.org/home.html>. [Accessed: Dec. 14, 2024].
- [4] ACM, "ACM Code of Ethics and Professional Conduct," 2018. [Online]. Available: <https://www.acm.org/code-of-ethics>. [Accessed: Dec. 14, 2024].
- [5] K. Beck et al., "Manifesto for Agile Software Development," 2001. [Online]. Available: <https://agilemanifesto.org/>. [Accessed: Dec. 15, 2024].