Michael Brusegard

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Skills

Languages: JavaScript, TypeScript, Python, Java, SQL, Kotlin, Lua, Rust, HTML & CSS.

Frameworks: React, Next.js, Angular, Django, Spring Boot, JavaFX, Jetpack Compose & Express.

Databases & API: PostgreSQL, MySQL, SQLite, Firestore, Drizzle ORM, REST, tRPC & GraphQL.

Infrastructure: Nginx, Apache, Docker, Playwright, Stripe, GCP, AWS & Azure.

Experience

DevOps Manager, Hackerspace NTNU - Trondheim   *Feb 2023 – Present*

Responsibilities:

- Led a team of 10+ student developers, providing training, mentorship, and conducting onboarding.
- Set up and managed seven Linux servers (Ubuntu/Debian) hosting critical services, including Nginx reverse proxy, Docker Compose, website and APIs, Matrix Synapse chat server, admin panels, translation service, and analytics.
- Managed continuous integration (CI) pipelines and integrated GitHub with the Matrix chat platform for streamlined communication and issue tracking.
- Took on a tech lead role, ensuring appropriate task allocation based on team members' skill levels.
- Led the technical development of a new website, making key decisions in collaboration with the team.
- Maintained the old website until the migration to the new platform.
- Managed the organization's GitHub account and technical infrastructure, ensuring proper access control for team members.
- Coordinated with leadership to prioritize tasks critical for ongoing operations.
- Created comprehensive documentation and guides for the infrastructure, CI pipelines, and technical processes to ensure smooth operations after my departure.

Learnings:

- Gained experience in leading a diverse team, ensuring alignment with project goals and responsibilities.
- Developed expertise in setting up and securing Linux servers, scaling self-hosted services with Docker, and managing CI pipelines.
- Migrated the 200 Hackerspace members to a new website and Matrix chat service, ensuring smooth access for all members.
- Improved communication and collaboration skills, working with team members of varying technical backgrounds and needs.
- Developed documentation skills, creating clear and concise guides to ensure long-term sustainability and ease of handover for future team members.

System Developer, Sticos AS - Trondheim   *Jun 2024 – Aug 2024*

Responsibilities:

- Created automations for the reconciliation forms in the account reconciliation product at Sticos, focusing on automatically filling out forms and updating old schemas with applicable suggestions.

- Optimizing automation algorithms to balance resource intensity and calculation accuracy, taking into account the limitations of client-side processing and limited access to data.

- Worked within the in-house economics development team, collaborating with four experienced back-end engineers.

- Participated in SCRUM meetings, including daily stand-ups, with the larger reconciliation team to track progress and ensure alignment with project goals.

- Finished with a presentation of my work to the company multiple times due to the success of my first presentation.

Learnings:

- Gained experience in learning and working with new technologies (Angular, RxJS, NgRx) while ensuring minimal disruption to the team. Set up Jest and unit tests for the automation calculations.

- Developed professional collaboration skills by working with people in diverse roles, including product managers and legal experts, to ensure that automation processes were accurate and met business needs.

- Worked closely with legal and economics experts to correctly implement the calculations and ensure they adhered to legal and business requirements. Collaborated extensively with one particular expert in these areas.

- Learned to balance the development of new features with the maintenance of technical debt within a large organization.

- Gained insight into how Sticos' large product, composed of various components, is built and deployed across Azure and on-premises solutions.

- Worked within the company's advanced CI pipeline and Jira setup, using custom solutions for development and staging.

Full Stack Developer, Niclas Nordlund Photography - Remote   *Sep 2022 – Oct 2023*

Responsibilities:

- Designed and developed my first website.

- Implemented photo storage using Google Cloud Storage for serving lower-quality public photos and storing the high-quality private copies for purchase.

- Integrated Stripe payments for seamless and secure transactions, allowing clients to purchase and download photos directly.

- Added email sending of a stored archive of the purchased photos upon purchase.

- Created a simple back-end with an intuitive photo upload solution.

- Incorporated the GitHub API for automatic issue generation.

Learnings:

- Gained experience in web technologies and web standards in developing a full-stack web applications without a framework.

- Learned to integrate third-party APIs (Google Cloud, Stripe, and GitHub).

- Improved skills in responsive web design and UX/UI development.

- Developed expertise in optimizing image storage and retrieval, considering bandwidth and performance limitations.

- Strengthened problem solving skills by addressing real-world challenges in e-commerce and digital asset management.

- Gained experience in independent project management, working directly with a client with little technical knowledge to define requirements.

Contact me if you need any references.

Education

Bachelor Computer Science, NTNU - Trondheim *2025*

General Study Competence, Valler High School - Bærum *2021*

Projects

Cyberfish, Collaborative Project - Trondheim *Jan 2024 – Present*

Description:

Cyberfish is a 3D-printed underwater ROV (Remotely Operated Vehicle) designed by a friend of mine and controlled via a Raspberry Pi. I develop the desktop application for controlling the ROV over Ethernet and work on the firmware responsible for motor control and camera streaming.

Technology:

Tauri, React, Rust, TypeScript, Tailwind CSS, Raspberry Pi, WebSockets, TCP Video Streaming, Picamera

Insights:

- Implemented WebSocket-based motor control for real-time responsiveness.
- Developed a TCP-based camera streaming system for low-latency video transmission.
- Designed and built the cross-platform desktop control interface using Tauri and React, allowing seamless user interaction.
- Actively collaborated with my friend skilled in 3D modeling and hardware, bridging the gap between software and mechanical design.
- Ensured stable communication between the Raspberry Pi firmware and the desktop application.

Lektr, Personal Project - Remote *Oct 2023 – Present*

Description:

Lektr is a modern alternative to Wikipendium, designed to be a free platform where students can collaboratively build compendiums and share learning resources. It features a rich-text editor with real-time collaboration, extensive recursive sidebar tree for organization, AI writing tools and Chatbot, and user statistics.

Technology:

Next.js, React, TypeScript, PostgreSQL, S3, Docker, Drizzle ORM, GraphQL, Yjs, Hocuspocus, Zustand, Stripe, TanStack Query, TanStack Form, TanStack Table, Zod, Slate, Radix UI, Tailwind CSS, AI SDK, Next-intl, Recharts

Insights:

- Implemented a real-time collaborative text editor using Yjs and Hocuspocus.
- Built a custom GraphQL API client for both Server and Client components with TanStack Query integration, localization using the Accept-Language header and built-in streaming using the AI SDK.
- Integrated AI-assisted writing and an AI chatbot with full context awareness of the active compendium.

- Developed an advanced recursive sidebar using dynamic UI state management through Zustand and with folding sections.

- Implemented custom session-based authentication system with Two-Factor authentication and an authorization solution using trusted users that can trust other users in a recursive fashion.

- Added a donation system with Stripe payments to allow users to donate to GiveWell.

- Built a statistics dashboard with user statistics, tracking contributions and donations with an interactive table and graphs.

- Optimized the platform for performance using Server Side Rendering (SSR), efficient S3-based image storage and client side API caching.

- Self hosting everything using Docker Compose and Nginx, with custom configurations for local development.

Tabline.wez, Personal Project - Remote   *Aug 2024 – Sep 2024 (Maintaining)*

Description:

Tabline.wez is a feature-rich, customizable tab bar plugin for the WezTerm terminal emulator. It provides an intuitive API for developing extensions and components.

Technology:

WezTerm, Lua

Insights:

- Designed the configuration API to follow the same principles as `lualine.nvim`, ensuring a familiar experience for Neovim users.

- Created an extensible architecture to support modular extensions for other plugins and components.

- A bunch of predefined components including WezTerm keytable (mode), Domain (SSH, Docker etc...), Datetime, system resources and more.

- Worked with outside collaborators to improve the plugin with new components and multi-platform compatibility.

New Website & Matrix Chat, Hackerspace NTNU - Trondheim   *Oct 2023 – Present*

Description:

Developing a modern replacement for the Hackerspace NTNU website, focusing on better maintainability and a more intuitive user experience. The website integrates tightly with a self-hosted Matrix chat server used by the whole organization. The website manages news, events, the shift schedule, storage and loans, 3D printers and reservations, recruitment and sharing information about the organization.

Technology:

Next.js, React, TypeScript, PostgreSQL, S3, Drizzle ORM, tRPC, Feide, TanStack Form, TanStack Query, Biome, Tailwind CSS, Zod, Matrix Synapse, Element Web, Synapse Admin, Hookshot, Motion

Insights:

- Implemented custom session-based authentication solution integrating with Feide for university sign in and supporting Hackerspace Account sign in for retired members. The authentication solution is linked with Matrix user registration and authorization is implemented on a group basis using tRPC procedures.

- Developed a real-time synchronization system between website users and their Matrix chat accounts. Blocking the specific parts of the Matrix API directly to ensure the accounts stay in sync.

- Setup internationalization so the website works both in English and Norwegian, and forward the locale information to the custom tRPC API.

- Created an intuitive UI/UX experience with light and dark mode, ensuring accessibility.

- Work closely in the DevOps team, performing extensive code reviews, delegate work and answer questions.

- Create proper documentation of how the website is built, write useful development scripts and local docker setup to make it easy for all team members to work on the website locally.

Server Setup, Hackerspace NTNU - Trondheim   *Sep 2024*

Description:

Led a collaborative effort to set up the seven Linux servers for Hackerspace NTNU, ensuring reliable infrastructure for hosting our services.

Technology:

Ubuntu, Debian, Nginx, Docker, Inadyn (Dynamic DNS Client), GitHub-based SSH Access Management, Fail2ban, RAID, Wake On Lan

Insights:

- Worked closely with team members to configure and deploy the servers.

- Installed and configured Ubuntu/Debian, ensuring secure and optimized environments.

- Deploy Nginx as a reverse proxy for handling traffic across services.

- Set up Docker and Docker Compose to manage self-hosted applications efficiently.

- Configured Inadyn for dynamic DNS management, ensuring smooth domain resolution.

- Developed an automated SSH access control system using GitHub actions, allowing per server based access management via public keys in the repository.

Open Emoji Platform (Bachelor Thesis), Zedge - Trondheim   *Jan 2024 – May 2024*

Description:

Open Emoji Platform is an Android application developed in collaboration with Zedge Europe AS as part of my bachelor thesis at NTNU. The application serves as a mobile extension of Emojipedia.org, enabling users to search for, understand, and interact with emojis in a structured and engaging way. It includes emoji descriptions, trending emoji news, a customizable favorite sequences feature, and an interactive emoji quiz game.

Technology:

Kotlin, Jetpack Compose, MVVM Architecture, Google AdMob, Amplitude Analytics, Figma (UI/UX Design)

Insights:

- Was responsible for all communication with the customer at Zedge and responsible for obtaining space to work at their office.

- Implemented the MVVM architecture to ensure separation of concerns, making the application scalable and maintainable.

- Developed the emoji grid display used in the search system and most popular emojis section.

- Designed and integrated emoji favorite sequences, enabling users to create, store and retrieve custom emoji collections.

- Ensured seamless integration of Google AdMob for in-app advertisements while maintaining a user-friendly experience.

- Designed the application to support Amplitude Analytics for tracking user interactions and behavioral insights.

- Worked in an agile Scrum team, collaborating with six other developers, conducting code reviews, and participating in sprint planning.

- Ensured the app followed Material Design 3 guidelines, providing a modern and intuitive user experience suited for an mobile app.

Vector Globe, Personal Project - Remote   *Feb 2024*

Description:

A 3D interactive globe built with Three.js, featuring vector lines that represent countries, continents or custom vectors. Users can interact with the globe to visualize geographic data and custom points.

Technology:

Three.js, GeoJSON, TypeScript, Vite, HTML, CSS

Insights:

- Implemented the winding number algorithm to detect whether the mouse is within a vector polygon. This enabled efficient hover effects and dynamic interactions with vector data.

- Designed a custom orbit control solution (inspired by react-tree-fiber) to provide smooth support for trackpad gestures and keyboard navigation, ensuring enhanced accessibility.

- Created a flexible system for placing custom HTML elements as interactive points on the globe, with a data-driven state to dynamically control their visibility/styling, if positioned behind the globe.

GlobeHub, University Project - Trondheim   *Feb 2024 – Oct 2024*

Description:

GlobeHub is a web application designed to help users discover, review, and track travel destinations. The platform enables users to browse destinations, leave reviews, filter locations based on preferences, and save places they have visited. The project was developed using modern web technologies with a focus on scalability and maintainability.

Technology:

Next.js, React, TypeScript, PostgreSQL, S3 Storage, Docker, Bun, Tailwind CSS, Next-Intl, Postgres.js, Auth.js, OpenWeatherMap API, OpenSteetMap

Insights:

- As the most experienced developer on the team I took ownership of the architecture and implementation.

- Designed and implemented a Create Read Update Delete (CRUD) application using Next.js.

- Set up a PostgreSQL database, S3-compatible object storage and Auth.js for the backend.

- Utilized React Server Components & Server Actions to handle queries and mutations efficiently without a separate API layer.

- Developed a filtering system using URL search parameters, allowing users to personalize suggestions based on their preferences.

- Integrated the OpenWeatherMap API with database caching, for showing the weather at a location.

- Showcase the location with an OpenStreetMap leaflet integration

- Facilitated team learning by organizing workshops on React and Next.js, although challenges arose in knowledge adoption.

- Optimized the development workflow by containerizing the entire stack with Docker, enabling seamless local development and deployment.

- Managed scrum-based project workflows in GitLab, including issue tracking, milestones, and sprint planning.

Workout Planner, University Project - Trondheim *Sep 2023 - Feb 2024*

Description:

Workout Planner is a JavaFX-based desktop application developed as part of the IT1901 Informatics course at NTNU. The application allows users to plan, track, and visualize their workout routines, featuring an intuitive interface and integration with a REST API for managing workout data. The project focused on improving code quality, applying software engineering principles, and ensuring maintainability throughout the development process.

Technology:

JavaFX, Java, REST API, Maven, Git, Checkstyle, JUnit

Insights:

- Implemented a Singleton pattern and a simple REST API in Spring Boot for smooth data handling.

- Collaborated in a team, contributing to code reviews, problem-solving, and ensuring alignment with project goals.

- Obtained high test coverages and fully incorporated Java Checkstyle comments.

Website, Niclas Nordlund Photography - Remote *Sep 2022 – Oct 2023*

Description: Developed and deployed a responsive photography website for Niclas Nordlund to showcase his portfolio, facilitate contact with potential clients, and sell digital copies of his photos. The site is hosted on Google Cloud Platform using App Engine, Cloud Functions, and Cloud Storage for a scalable and maintainable setup.

Technology:

HTML, CSS, JavaScript, Google Cloud Platform, App Engine, Cloud Functions, Stripe API, GitHub API

Insights:

- Implemented custom cloud functions for photo handling, including compression, deletion, and archiving, streamlining the upload and purchase process.

- Integrated Stripe API for secure transactions and developed a bug reporting system using GitHub issues to enhance user feedback and support.

- Collaborated closely with Niclas to ensure the website met his unique requirements and design preferences, maintaining a high level of quality and user experience.

WebGL Fluid Enhanced, Personal Project - Remote *May 2023 - Oct 2024 (Maintaining)*

Description:

WebGL Fluid Enhanced is a complete refactor of Pavel Dobryakov's WebGL Fluid Simulation, rewritten in TypeScript to support a class-based structure. I adapted it for use on my personal website, enabling enhanced flexibility and customization.

Technology:

TypeScript, Vite, GLSL, HTML, CSS

Insights:

- Refactored the original simulation into TypeScript with ES Module support and optimized the build for performance.

- Enabled dynamic configuration changes during runtime for more flexibility.

- Added features such as triggered splats, location-specific splatting, hover activation, and adjustable brightness.

- Introduced custom color palettes, color inversion, and the ability to set custom background images/colors.

- Implemented pause/resume functionality for user control and a dispose function for removing DOM listeners.

Old Website, Hackerspace NTNU - Trondheim   *Mar 2023 - Apr 2024*

Description:

Contributed to various improvements and maintenance of the old Hackerspace NTNU website. Later, as DevOps Manager, I led the decision to deprecate the old site in favor of developing a more maintainable solution.

Technology:

JavaScript, Python, Django, CSS, HTML

Insights:

- Developed a custom JavaScript game for the 404 error page.

- Implemented a shopping cart feature on the storage page, so multiple items could be loaned.

- Helped with the migration from Django 3 to Django 5, addressing security vulnerabilities and ensuring system stability.

Chinese Checkers, University Project - Remote   *Mar 2023 - Apr 2023*

Description:

Developed a JavaFX implementation of the classic Chinese Checkers game, where players move pieces across a hexagonal grid to reach the opposite side. The game includes features like highlighting legal moves, enforcing move rules, and saving/loading game states.

Technology:

Java, JavaFX

Insights:

- Utilized object-oriented principles, including inheritance and interfaces, for better maintainability and future expansion.

- Implemented the Model-View-Controller (MVC) design pattern to separate concerns between data, user interface, and user input handling.

- Tested game logic such as move enforcement, legal move highlighting, and save/load functionality to ensure smooth gameplay.

Many of my projects are open source. Feel free to explore the code on my GitHub. Direct links to the projects are available on my website.