Kamil Musiał

Senior Software Engineer | Technical Architect | Strategic Tech Consultant (MBA)

SUMMARY

Senior Software Engineer & Tech Leader with 9+ years of end-to-end product delivery experience across enterprise, fintech, energy, retail, and IoT sectors. Recognized for *architecting and scaling production-critical systems* from 0 to millions of users using cutting-edge full-stack technologies (Node.js, TypeScript, React, AWS, Kubernetes, microservices).

Holds an **MBA in Strategic Management & Leadership** with strong cross-domain understanding of both technology and business growth. A proven force multiplier and system thinker, I bring technical firepower, DevOps maturity, and business intuition into every project.
I'm not looking for a "job" — I'm hunting **impact, innovation and autonomy** in high-stakes environments.

If you're building something bold — I bring the architecture, code, culture and leadership to make it inevitable.

KEY ACHIEVEMENTS

🚀 **Scaled enterprise platforms** from 10k to 1M+ users with <2s global response times and 99.99% uptime SLA.
🧠 **Architected 3 modular microservice ecosystems** adopted by 4+ international product teams.
🏆 **1st Place** – HackYeah 2023 (Europe's largest hackathon): national-scale data resilience solution.
💸 **Designed blockchain-based payment engine** adopted by fintech accelerator for cross-border finance.
🛠️ **Delivered 15+ fullstack commercial products** across industries: banking, energy, logistics, e-commerce, healthcare.
🎓 **Earned MBA** in Business Strategy & Leadership – trained in high-level decision making, negotiation & project scaling.
🧭 **Introduced domain-driven design & clean architecture** across 3 large codebases, reducing tech debt by 70%.
📈 **Reduced infrastructure costs by 45%** via Kubernetes optimization and serverless refactors (AWS + Azure).
🔐 **Implemented zero-downtime CI/CD pipelines** and DevSecOps policies adopted org-wide.
🎯 **Rewrote legacy aviation backend** in 2 months, eliminating 95% of critical bugs and boosting response by 300%.
💬 **Mentored 12+ engineers**, scaled teams from 2 to 10+ people, and led hiring for senior/staff roles.
⚙️ **Developed proprietary game engine** in TypeScript + WebGL for custom 2D/3D rendering.
🔍 **Built real-time analytics dashboards** handling 100k+ events/day with scalable Node.js architecture.
💡 **Invented IoT-based logistics platform** combining Node.js, React, C++ and real-time C2 integration.
🧬 **Designed AI-powered accessibility app** for sign-language-to-speech translation (awarded by WSEI Kraków).
🌐 **Created travel marketplace** acquired by private investor after MVP traction (React + Node + payment gateway).

PROGRAMMING LANGUAGES

Javascript

Typescript

C#

FRAMEWORKS

NestJS

Express

.NET

Unity

DATABASES

MariaDB

MongoDB

SOURCE CONTROLS

Github

TASK MANAGEMENT

Clickup

Asana

Trello

💾 **Built and refactored 50+ APIs**, optimized for throughput, caching, and async resilience (NestJS, Express).
📚 **Published reusable libraries** for internal engineering platforms, improving DX and codebase cohesion.
🔁 **Reverse-engineered BLE communication protocol** for hardware control (C++, Python) with full device unlock.
🌍 **Led international collaboration** on solar power redistribution system – combining hardware + smart backend.
🔬 **Developed 5D game simulation** with custom math engine, transforming Unity for non-Euclidean spaces.

WORK EXPERIENCE

Devire Sp. z o.o., Remote – Senior Software Engineer

April 2025 – October

At Devire, I focus on building and optimizing digital payment and checkout solutions, enabling seamless in-store and online purchasing experiences. My role extends across backend engineering, feature development, and system integration — ensuring scalability, operational excellence, and alignment with business strategy.

Responsibilities:

- **One-Time Card (OTC) Management** – Oversaw the full lifecycle of temporary digital cards, from generation to successful purchase confirmation. Implemented tailored processes based on merchant risk assessments, ensuring secure and frictionless transactions.
- **Service Fee Management** – Designed and controlled service fee logic and pricing, a key monetization mechanism. Ensured consistency with strategic business goals while balancing customer expectations.
- **Payment Method Integration** – Built and maintained backend integrations with payment methods. Designed interfaces for selecting and processing payments, ensuring reliability and compliance.
- **System Reliability** – Participated in disaster recovery testing to validate stability, robustness, and fault tolerance of mission-critical systems.
- **Documentation & Process Improvement** – Established technical documentation for in-app workflows and payment architecture. Defined team-specific best practices to improve collaboration, onboarding, and efficiency.

Key Achievements:

- **Operational Excellence** – Contributed to dashboards that tracked and optimized business-critical performance indicators, including weekly active users (WAU), conversion rates across the card funnel, and profit/loss ratios for digital card services.
- **Monetization Impact** – Played a pivotal role in driving revenue by aligning fee structures with company strategy, contributing directly to OTC monetization and financial performance.

DEVELOPER IDE

Jetbrains Webstorm

Jetbrains Rider

DEVELOPER TOOLS

Github Desktop

Postman

CLOUD SOLUTIONS

Heroku

Azure

OPERATING SYSTEMS

Windows 11

Windows 10

Ubuntu

MacOS Silicon Based

LANGUAGES

Polish

English

German

HOBBIES

Programming

Game Development

- **Process Optimization** – Streamlined development workflows by documenting processes and implementing improvements in conversion funnel analysis, boosting efficiency and developer experience.
- **Scalability & Reliability** – Strengthened platform stability by supporting disaster recovery protocols, improving overall service resilience and customer trust.

Technical Expertise:

- Backend architecture and payment system integrations.
- Infrastructure as Code (IaC) practices and automation of deployment pipelines.
- Conversion funnel optimization, risk analysis, and performance monitoring.
- Tools & processes for disaster recovery, observability, and incident response.

Impact:
Enhanced the company's digital payment capabilities, enabling a unified and frictionless checkout experience. Increased customer satisfaction through reliable integrations and improved merchant adoption via fee configuration strategies. Delivered measurable business value by combining technical execution with system-level thinking, ensuring solutions were not only functional but also revenue-generating and strategically aligned.

Link to company: Link

Tech stack: TypeScript, Node.js, React, AWS, Kubernetes, IaC, Experimentation Platform

ALDI Nord, Kraków – Senior Technology Consultant

November 2023 – April 2025

I play a **multifaceted role** that extends beyond software development to include responsibilities typically associated with **Product Ownership, DevOps, system architecture, and technical leadership**. While my primary focus is on **backend and frontend development**, I actively engage in **system design, strategic planning, and cross-team collaboration** to ensure the **efficiency and scalability** of our solutions.

Leveraging my expertise in **Node.js and React.js**, I contribute to the **development and enhancement** of key internal systems, implementing **best practices in software engineering**. I take ownership of **critical technical initiatives**, including **architectural improvements and system optimizations**, to enhance **maintainability, performance, and reliability**. I also actively participate in **code reviews and testing strategies**, ensuring adherence to **high-quality development standards**.

Beyond development, I am involved in **process optimization and technical decision-making**, working closely with **stakeholders** to align **business goals**

Blockchain

SocialMedia

Github

LinkedIn

Brand

with technical solutions. Additionally, I have taken a **proactive approach** to identifying and addressing **legacy issues**, modernizing existing services to improve **stability and operational efficiency**.

Committed to **continuous improvement**, I frequently propose and drive forward **new initiatives** aimed at **enhancing system reliability, reducing costs, and improving performance**. My role also involves **mentoring team members, fostering collaboration, and advocating for best engineering practices** within the organization.

Link to company: Link

Tech stack: TypeScript, React, Node.js, AWS, Kubernetes, CI/CD, microservices, event-driven architecture, DevOps, SQL, NoSQL

Avenga sp.zoo, Kraków – Senior Software Engineer

October 2022 – November 2023

At Avenga, I was responsible for ensuring the quality and maintainability of the software by implementing thorough testing strategies and rigorous code review processes. My work revolved around developing robust and scalable solutions using modern technologies, primarily focused on backend and frontend development with Node.js and React.js.

I played a crucial role in designing and implementing new features while maintaining high performance, scalability, and security standards. Utilizing my expertise in AWS, I worked with a variety of its cloud services to optimize application performance, improve reliability, and ensure seamless scalability. I also took an active role in CI/CD processes, leveraging Jenkins to automate deployments and streamline development workflows.

Beyond development, I collaborated closely with cross-functional teams, including product managers, designers, and DevOps engineers, to align technical solutions with business requirements. My responsibilities extended to working with microservices and micro frontends, where I focused on modular and maintainable architecture to support large-scale applications.

Additionally, I contributed to the company's engineering culture by mentoring junior developers, conducting technical workshops, and driving best practices for clean code and maintainable software.

Link to company: Link

Tech stack: TypeScript, React, Node.js, AWS, Jenkins, Jira, micro frontends, microservices, Express, REST API

Euvic sp.zoo, Kraków – Backend Developer

May 2022 – October 2022

Working for an external company in the aircraft and aviation industry, I was responsible for the development and maintenance of multiple backend APIs critical to the company's operations. My role involved designing,

implementing, and optimizing backend services to ensure seamless data flow and integration between different systems.

One of my key responsibilities was **rebuilding the entire API system**, transitioning it from a legacy structure to a well-architected **RESTful API** to improve performance, maintainability, and scalability. I also worked extensively on **enhancing an existing API**, fixing critical bugs, optimizing response times, and ensuring proper error handling to improve overall system stability.

Additionally, I played a major role in the **development of a third API**, which involved designing its architecture from scratch, implementing business logic, and integrating it with cloud-based infrastructure to ensure reliability and scalability. Throughout the project, I leveraged **Azure services and pipelines** to deploy, monitor, and manage cloud-hosted applications efficiently.

Collaboration was a crucial aspect of my role, as I worked closely with frontend developers, DevOps engineers, and product stakeholders to ensure seamless integration between the APIs and the client-facing applications. I also actively participated in **code reviews, CI/CD pipeline improvements, and cloud infrastructure optimizations** to enhance overall development workflows.

Link to company: Link

Tech stack: Typescript, Angular, NodeJS, Azure, Azure Pipeline, Jira, NestJS

Asroom sp.zoo, Kraków – Full Stack Developer

August 2018 – May 2022

As a **Full Stack Developer** at Asroom, I was responsible for building and expanding the company's in-house tools and developing the **ITRoom brand**, contributing to its growth and technical infrastructure. My role encompassed a wide range of **web development projects**, including **custom websites, e-commerce platforms, and web applications**, ensuring high performance, scalability, and modern UX/UI standards.

Beyond software development, I took on leadership responsibilities by **hiring and managing an IT team**, defining team workflows, and establishing **agile development processes**. I played a key role in **budget planning and sprint management**, allocating resources efficiently to maximize development velocity while maintaining code quality.

A significant part of my work involved **architecting and implementing microservices and micro frontends**, ensuring modularity and maintainability across projects. I also worked with **various cloud solutions** (AWS, Heroku) to **deploy, monitor, and optimize applications**, leveraging CI/CD pipelines (Jenkins) to automate deployments and testing.

Additionally, I contributed to **WordPress and PHP-based projects**, integrating custom functionalities and optimizing existing solutions. My experience extended to **C++ and C# development**, particularly for performance-critical

applications and backend services.

Throughout my tenure, I actively collaborated with stakeholders to **align business goals with technical solutions**, ensuring seamless integration of new features while maintaining high code quality standards.

Link to company: Link

Tech stack: TypeScript, Angular, React, Vue, Node.js, AWS, Jenkins, Jira, NestJS, Heroku, WordPress, PHP, C++, C#, JavaScript, microservices, micro frontends

Financeroom, Myślenice – Front-end Developer

August 2015 – August 2018

As a **Front-end Developer** at Financeroom, I was responsible for designing and developing **responsive websites and web applications**, ensuring a seamless user experience across different devices and browsers. My work primarily focused on **HTML5, CSS3, and JavaScript**, where I implemented modern UI/UX principles to enhance usability and performance.

I played a key role in **developing and maintaining WordPress-based websites**, customizing themes and plugins to meet client requirements. Additionally, I gained experience in **backend development**, gradually expanding my skill set by working on server-side logic, database integrations, and API connections to support web applications.

During my time at Financeroom, I collaborated closely with designers and backend developers to create visually appealing and functional solutions tailored to business needs. This role served as a strong foundation for my future transition into **full-stack development**, providing me with hands-on experience in both frontend and backend technologies.

Link to company: Link

Tech stack: HTML5, CSS3, Javascript, Wordpress

EDUCATION

Computer Science And Econometrics, Kraków – *Bachelor of Engineering*

October 2019 – 2023 (not finish)

During my studies, I focused on a **strong mathematical and programming foundation**, covering key areas such as **linear algebra (vectors, matrices), calculus (integrals, differential equations), and discrete mathematics**. These subjects were particularly relevant to the field of **computer science and game development**, enabling me to apply mathematical concepts to real-world programming challenges.

As part of the curriculum, I gained extensive experience in **C# development**,

using it for various academic and personal projects. I explored **game mechanics, physics simulations, and algorithm optimization**, applying my knowledge to build interactive and computationally efficient solutions.

My **engineering thesis** revolved around **creating the fifth dimension in computer games**, a project that required an in-depth understanding of spatial transformations, non-Euclidean geometry, and custom mathematical models to represent multidimensional interactions in a game engine.

Throughout my academic journey, I actively sought opportunities to bridge theoretical knowledge with practical applications, reinforcing my expertise in **software engineering, mathematical modeling, and game development**.

Key Focus Areas:

- **Programming:** C#, algorithms, data structures
- **Mathematics:** Linear algebra, calculus, vectors, matrices
- **Game Development:** Physics simulations, spatial transformations, engine scripting

Link to school: Link

IT Technican, Mathematics And Computer Science, Myślenicce — *IT Technician*

September 2015 – Jun 2019

During my time at the technical institute, I gained a **comprehensive understanding of IT fundamentals**, including **computer hardware architecture, network administration, and software development**. The program provided hands-on experience in **computer assembly, troubleshooting, and network configuration**, laying the groundwork for my future career in software engineering.

In addition to core IT subjects, I obtained **three internationally recognized professional qualifications**, demonstrating my expertise in multiple areas of information technology:

- **E12** – Installation and operation of personal computers and peripheral devices
- **E13** – Designing local computer networks and network administration
- **E14** – Creating internet applications, database management, and administration

These certifications allowed me to officially obtain the **IT Technician** title, validating my skills in **computer system maintenance, software development, and network infrastructure management**. The program also introduced me to **programming and web development**, where I started working with **databases and web technologies**, forming a solid foundation for my later specialization in

full-stack development.

Key Focus Areas:

- **Hardware & Networking:** Computer assembly, network setup, system administration
- **Software Development:** Web applications, databases, scripting
- **Technical Expertise:** IT security, troubleshooting, IT infrastructure

Link to school: Link

COMMERCIAL PROJECTS

2022- Application connected with bank pipe based on blockchain – React, NodeJS, Typescript, Python

This project emerged as a result of a successful **hackathon**, where our team developed a concept for an **instant international payment solution** leveraging **blockchain technology**. Following the event, we secured collaboration with a company that provided funding to explore the feasibility of a system similar to **International BLIK**, designed to enable seamless **cross-border money transfers**.

The application was structured as a **modular and scalable solution**, consisting of a **standalone payment processing engine** and a **user-facing interface** that facilitated instant transactions between international banks. Blockchain technology was integrated to **enhance security, transparency, and transaction efficiency**, reducing reliance on traditional banking intermediaries.

My role in the project included:

- **Developing the backend architecture** in **Node.js** and **TypeScript**, ensuring secure and efficient handling of transactions.
- **Integrating blockchain protocols** to provide immutable transaction records and decentralized validation mechanisms.
- **Creating a React-based front-end** for an intuitive user experience.
- **Collaborating on Python-based financial data processing**, ensuring smooth data flow and compliance with financial regulations.

Despite its strong technical foundation and **positive initial reception**, the project was ultimately **discontinued** after several months due to strategic shifts within the partnering company. Nonetheless, the experience provided valuable insights into **financial technology, blockchain implementation, and secure transaction processing** in a distributed environment.

2020 - Application connected with machines registry – React, NodeJS, C++

This project was one of the most **technically complex** applications I have worked on, requiring a **comprehensive system for managing industrial machinery data**. The platform functioned similarly to **a social network for**

mechanics, allowing users to **register, track, and review machine inventory**, while also facilitating **real-time data synchronization** between connected hardware and the backend system.

The application was designed to:

- Enable **mechanics and operators** to input, update, and track machine data in a centralized system.
- Integrate with **IoT-connected machinery**, allowing devices to **transmit real-time operational data** directly to the backend.
- Provide an **interactive dashboard** where users could view machine statuses, maintenance schedules, and performance analytics.

My contributions to the project included:

- **Developing the frontend** in **React**, ensuring a **responsive and user-friendly interface** for mechanics and administrators.
- **Implementing the backend architecture** in **Node.js**, enabling efficient data processing, validation, and API endpoints for machine interactions.
- **Collaborating with a C++ developer** to facilitate **hardware integration**, allowing machines to send **live status updates** to the system.
- Designing a **structured database model** to support large-scale machinery data while ensuring fast query performance.

The project required extensive coordination between **software developers, hardware engineers, and industry professionals**, making it a **highly interdisciplinary** and **technically challenging** initiative. The successful implementation of **real-time machine monitoring** and **data-driven analytics** proved to be a **game-changer for operational efficiency** in industrial environments.

2020 - **Application connected with helping tourist to find a vacation** – React, NodeJS, Typescript

This project was designed as a comprehensive travel booking platform, combining elements of "Booking.com" and "Wakacje.pl," allowing users to search, book, and manage active holiday experiences. The platform catered to both individual travelers looking for customized vacation options and travel organizers offering curated holiday packages.

Key Features & Functionalities:

- User-Friendly Search & Booking System: Travelers could browse vacation packages, filter options based on location and activity type (seaside, mountains, skiing, etc.), and make instant reservations.
- Organizer Management Dashboard: Service providers could list their offerings, set availability, and process secure online payments with integrated commission-based transactions.
- Reviews & Ratings System: Users could leave feedback and rate experiences, ensuring transparency and trust within the platform.

- Automated Booking & Payment Processing: Implemented a seamless payment flow that handled transactions, refunds, and commission distribution for travel organizers.
- Account Management & Notifications: Users had personalized dashboards to track their bookings, receive recommendations, and get real-time notifications.

My Contributions:

- Developed the frontend in React, ensuring an intuitive and responsive user interface for both travelers and service providers.
- Implemented a scalable backend in Node.js, handling API requests, database interactions, and payment processing.
- Integrated secure authentication and user management using modern authentication protocols.
- Designed and optimized a database structure to efficiently manage listings, user data, and transactions.
- Ensured platform security and compliance with payment regulations and data protection standards.

Outcome:
The application gained significant traction, successfully attracting both travelers and vacation organizers. Due to its scalability, automation, and business potential, the platform was eventually acquired by an investor, marking a successful completion of the project.

2019 - **Teaching programming** – Javascript, C++

As a result of my involvement in technical and IT-related competitions, I had the opportunity to teach programming classes for children. This project was funded by the European Union and conducted by the "Małopolska Academy of Talents." The initiative aimed to introduce young learners to the fundamentals of programming and computational thinking, fostering their interest in technology at an early stage.

My responsibilities included:

- Preparing structured lesson plans and course materials to align with EU educational requirements.
- Creating engaging presentations and interactive coding exercises to make programming concepts accessible to children.
- Maintaining attendance records and tracking student progress throughout the program.
- Providing hands-on guidance in JavaScript and C++, helping students develop their problem-solving skills through practical coding tasks.
- Organizing and supervising an IT project in which students worked collaboratively on a presentation about a famous mathematician, applying their newly acquired programming knowledge.

This three-month experience not only strengthened my teaching and mentorship abilities but also reinforced my skills in teamwork, curriculum

development, and strategic planning.

2018 - **Online Selling bakery** – React, NodeJS

As a **Full Stack Developer**, I collaborated with another developer to build an **innovative online bakery platform**, which aimed to modernize the traditional bakery business by integrating **e-commerce functionality with real-time logistics management**.

The platform was designed to provide customers with an **immersive bakery experience**, allowing them to explore available products and place orders for next-day delivery via a dedicated courier service. One of its most unique features was the **real-time demand and supply synchronization**, which enabled bakeries to dynamically adjust production based on incoming orders.

Key Features & Functionalities:

- **E-commerce platform** where customers could browse products, place orders, and schedule deliveries.
- **Real-time order notifications** using WebSockets, ensuring bakeries and couriers received instant updates about new orders.
- **Automated courier dispatching system** that assigned deliveries to available couriers based on proximity and availability.
- **Feedback and review system**, allowing customers to rate products and services to improve quality control.
- **Admin panel for bakery management**, providing business owners with an overview of orders, stock levels, and customer interactions.

My Contributions:

- Developed the **frontend in React**, ensuring a smooth and user-friendly shopping experience.
- Implemented the **backend in Node.js**, handling real-time order processing, notifications, and logistics coordination.
- Integrated **WebSockets for live order updates**, allowing bakeries and couriers to operate more efficiently.
- Designed and optimized the **database structure**, ensuring fast and scalable data retrieval.
- Worked closely with stakeholders to refine requirements and enhance platform functionality.

Outcome:
This project was considered ahead of its time for integrating **real-time logistics with an online bakery**, offering a seamless experience for both customers and business owners. The system successfully streamlined **order fulfillment, product availability tracking, and delivery logistics**, demonstrating the potential of technology-driven bakery services.

2017 - **Mobile app for Pizzeria** – Xamarin C#

This was my **first commercial project**, where I developed a **mobile application for a pizzeria**, enabling customers to browse the menu and place orders directly

from their smartphones. The app was designed to streamline the **ordering process**, improve **customer engagement**, and provide a **seamless user experience**.

Key Features & Functionalities:

- **Intuitive UI/UX** with a well-structured menu, allowing users to browse products and customize their orders.
- **Order management system**, where customers could select items, specify quantities, and place orders with minimal effort.
- **API integration with the pizzeria's internal system**, ensuring real-time updates on order status.
- **Secure data handling**, allowing smooth and encrypted communication between the app and the backend.
- **Cross-platform compatibility**, built using **Xamarin**, ensuring availability on both **Android and iOS** devices.

My Contributions:

- Developed the **mobile application in Xamarin (C#)**, ensuring cross-platform compatibility.
- Designed and implemented the **user interface**, prioritizing ease of use and intuitive navigation.
- Integrated a **REST API** to communicate with the restaurant's backend order management system.
- Optimized **performance and security** to provide a smooth and reliable ordering experience.

Outcome:
The app successfully enhanced the **customer ordering experience**, reducing wait times and improving order accuracy. By integrating **real-time API communication**, the system allowed the pizzeria to efficiently manage orders, leading to improved customer satisfaction and operational efficiency.

COMMERCIAL PROJECTS WITH COMPANIES

2021 -Application for selling furniture – NodeJS, React, Unity

This project was designed to streamline **furniture ordering and customization**, enabling users to place **direct orders from carpenters** through a modern **web-based platform**. A key aspect of the system was its integration with **a Unity-powered visualization tool**, allowing customers to **preview and interact with furniture models** before placing an order.

Key Features & Functionalities:

- **Furniture catalog and order management** system, where carpenters could list their products and customers could place customized orders.
- **Interactive 3D visualization**, developed in **Unity** and rendered using **WebGL**, allowing users to inspect and modify furniture designs before

finalizing their order.
- **User profiles and order tracking**, enabling customers to manage their purchases and communicate with carpenters.
- **Backend API built with Node.js**, handling user authentication, order processing, and database interactions.
- **Frontend built with React**, ensuring a **responsive and intuitive** user interface for browsing and customizing furniture.

My Contributions:

- **Developed the backend in Node.js**, implementing RESTful APIs for order processing and user management.
- **Implemented the frontend in React**, creating a user-friendly interface for seamless navigation and product selection.
- **Integrated Unity's WebGL rendering**, allowing real-time 3D previews of custom furniture.
- **Designed and optimized the database**, ensuring efficient handling of furniture listings, user data, and transactions.
- **Worked on API security and performance improvements**, ensuring a smooth and reliable user experience.

Outcome:
The application successfully **bridged the gap between carpenters and customers**, offering an innovative way to browse and order custom furniture online. The **3D visualization feature** significantly improved user engagement and confidence in purchases, making the platform **an effective and scalable solution for furniture makers**.

2021 -Application connected with electricity power – NodeJS, React, C++

This project focused on **integrating solar energy systems with a power management platform**, enabling users to **optimize electricity consumption** by redistributing surplus energy. The application worked in conjunction with a larger **energy monitoring system**, tracking electricity demand and ensuring **efficient distribution of excess power** generated by solar panels.

Key Features & Functionalities:

- **Real-time energy monitoring**, allowing users to track electricity generation and consumption from solar panels.
- **Smart power redistribution system**, automatically allocating surplus energy to users in need, reducing energy waste.
- **Integration with external energy grids**, enabling seamless interaction with other power sources and optimizing energy flow.
- **Custom user dashboards**, built with React, providing detailed energy analytics and consumption insights.
- **Backend infrastructure in Node.js**, handling API communication, energy transaction records, and real-time updates.
- **C++-based energy data processing module**, managing real-time

calculations and grid load balancing.

My Contributions:

- **Developed the backend in Node.js**, implementing API endpoints for real-time energy tracking and user data management.
- **Built the frontend in React**, designing intuitive dashboards to display live power statistics and system analytics.
- **Implemented C++ components** for real-time **energy calculations and load balancing**, ensuring efficient power distribution.
- **Worked on system optimization**, reducing response times and improving the accuracy of electricity demand predictions.
- **Ensured security and compliance**, implementing encryption protocols for secure energy transactions and user authentication.

Outcome:
The application successfully **enhanced energy efficiency** by redistributing surplus power, allowing users with solar panels to **benefit from zero-cost electricity** whenever excess energy was available. The platform played a key role in **supporting renewable energy adoption**, reducing dependency on traditional power grids while improving energy sustainability.

2021 -Application connected with inhouse moves – NodeJS, React, C++

This was one of the **largest and most complex projects** I have worked on, involving the **development of a comprehensive in-company logistics and workforce management system**. Initially designed as an **MVP** for managing employees and assigning tasks, the application gradually evolved into a **full-scale logistics and data management platform**, incorporating features such as **customer data storage, shipping reports, and sales contract generation**.

Key Features & Functionalities:

- **Employee and task management system**, allowing supervisors to assign and track tasks in real-time.
- **Customer data integration**, storing relevant business information and streamlining logistics workflows.
- **Automated shipping reports**, ensuring accurate documentation of company-wide moves and deliveries.
- **Sales contract generation**, enabling seamless creation and management of agreements between internal teams and external partners.
- **Scalability and system interoperability**, designed to integrate with **external platforms**, including a previously developed **energy management system**.
- **Real-time data synchronization**, using **C++ components** for high-performance processing and **React dashboards** for user interaction.

My Contributions:

- **Developed the backend in Node.js**, implementing API endpoints for task management, employee tracking, and logistics operations.
- **Built the frontend in React**, creating an intuitive dashboard for **managing employees, shipments, and customer data**.
- **Implemented C++-based data processing modules**, optimizing system performance for large-scale data transactions.
- **Integrated the application with external systems**, enabling **seamless communication with renewable energy management platforms**.
- **Enhanced data security and compliance**, ensuring the secure handling of **sensitive customer and business data**.

Outcome:
The application has undergone **continuous development and expansion**, growing far beyond its initial scope. From a simple workforce management tool, it has become a **mission-critical logistics platform**, improving **task automation, operational efficiency, and cross-system connectivity** within the company.

2020 - Bug Fixes for hotel booking system – NodeJS

This project involved **rescuing and stabilizing a hotel booking system** that had been left in an unfinished and problematic state by a previous development team. An **international businessman** approached the company with an urgent need to **fix critical issues, optimize performance, and finalize the application** to ensure a fully functional and reliable booking experience.

Key Challenges & Fixes:

- **Debugging and fixing major system failures**, including API errors, database inconsistencies, and security vulnerabilities.
- **Optimizing backend performance**, reducing response times and improving the efficiency of booking transactions.
- **Fixing payment processing issues**, ensuring seamless integration with online payment gateways.
- **Improving data consistency**, addressing synchronization problems between hotel availability, user bookings, and cancellations.
- **Ensuring proper API communication**, stabilizing connections between the frontend, backend, and third-party services.

My Contributions:

- **Analyzed and diagnosed existing bugs**, identifying the root causes of system failures.
- **Fixed backend logic issues in Node.js**, ensuring smooth booking transactions and error-free data processing.
- **Refactored inefficient code**, optimizing performance and reducing system downtime.
- **Collaborated with the frontend team**, ensuring that API responses aligned with user interface expectations.

- **Implemented logging and monitoring tools**, improving debugging and future maintenance capabilities.

Outcome:
Through extensive **debugging, optimization, and development work**, the system was successfully stabilized and delivered as a **fully functional hotel booking platform**. The project demonstrated the **importance of structured development and proper maintenance**, ensuring that the business could operate smoothly without further technical disruptions.

2019 - **Application for finding job opportunities** – React, NodeJS

This project involved the development of a **job search engine**, designed to provide users with a platform for **browsing and applying for job opportunities** across various industries. The system was built with **React and Node.js**, offering an intuitive and responsive user experience while ensuring **efficient backend processing** for job postings and applications.

Key Features & Functionalities:

- **Job search and filtering system**, allowing users to refine job listings based on criteria such as location, industry, and skill requirements.
- **Employer dashboard**, enabling companies to post job listings, manage applications, and communicate with candidates.
- **User profiles and application tracking**, allowing job seekers to upload resumes, track their applications, and receive notifications.
- **Real-time data updates**, ensuring that job postings and application statuses remained up to date.
- **Scalable backend infrastructure**, built with Node.js to handle high volumes of job postings and user activity.

My Contributions:

- **Led a team of three developers**, overseeing the project's architecture, planning, and technical implementation.
- **Developed both frontend (React) and backend (Node.js)**, ensuring seamless interaction between the user interface and database.
- **Designed the database structure**, optimizing it for fast job searches and efficient data retrieval.
- **Implemented authentication and security features**, ensuring user data protection and safe job applications.
- **Integrated third-party APIs**, enhancing job listing capabilities with external sources.

Outcome:
Although the application successfully reached the **production stage**, it ultimately **did not gain traction with the target audience**. However, the project was a valuable experience in **leading a development team, designing scalable full-stack applications, and understanding market challenges in the job**

recruitment industry.

2018 - Website for European Union Founding – React

This project involved the development of a **landing page** for a company seeking **funding from the European Union**. The website served as an **informational platform**, presenting the company's mission, goals, and funding requirements in a **clear and visually appealing format**.

Key Features & Functionalities:

- **Modern and responsive design**, ensuring accessibility across different devices and screen sizes.
- **Content-driven structure**, effectively showcasing the company's objectives and funding needs.
- **Optimized for performance**, ensuring fast load times and smooth navigation.
- **SEO-friendly architecture**, increasing visibility for potential investors and funding institutions.

My Contributions:

- **Developed the website using React 16**, leveraging component-based architecture for modular and maintainable code.
- **Implemented responsive UI/UX design**, ensuring a seamless experience across desktop and mobile devices.
- **Optimized website performance**, reducing load times and improving page speed.
- **Ensured cross-browser compatibility**, making the site accessible to a wide audience.

Outcome:
The website successfully **helped the company present its funding proposal**, providing a **professional online presence** to support its European Union funding application.

2018 - Website for Financial Stuff – React

This project involved the development of a **web platform for a credit and finance company**, designed to provide users with **financial tools, calculators, and interactive features** for managing their financial planning. The website was built to **integrate seamlessly with an existing API**, allowing real-time data exchange and financial computations.

Key Features & Functionalities:

- **Profit calculators** for estimating potential financial returns based on user input.
- **Various financial tools** for credit analysis, loan estimations, and budget planning.
- **Seamless API integration**, enabling real-time data exchange between the frontend and backend.

- **Fully responsive design**, ensuring accessibility across all devices, including desktops, tablets, and smartphones.
- **Secure data transmission**, ensuring the protection of sensitive financial information.

My Contributions:

- **Developed the frontend using React**, creating a dynamic and user-friendly interface.
- **Integrated the website with an existing API**, ensuring accurate data retrieval and submission.
- **Implemented responsive UI design**, making financial tools accessible on all screen sizes.
- **Optimized performance and accessibility**, ensuring smooth navigation and fast load times.
- **Ensured compliance with security best practices**, protecting user data and financial calculations.

Outcome:
The platform successfully provided users with **intuitive financial tools**, allowing them to make informed decisions based on real-time calculations. The project demonstrated the **importance of API-driven financial applications** and delivered a **scalable, responsive, and user-friendly solution** for financial management.

2018 - **Application for booking trips for woman** – React, Wordpress

This project was one of the **most technically challenging** applications I worked on as part of a **two-person team**, consisting of me as a **React developer** and a colleague specializing in **WordPress and PHP development**. The goal was to create a **travel booking platform specifically designed for women**, offering curated trip packages and a seamless **reservation system**.

Key Features & Functionalities:

- **Custom travel booking system**, allowing users to browse, select, and book curated trips.
- **Seamless integration between React and WordPress**, enabling a dynamic frontend while leveraging WordPress for content and data management.
- **User account system**, providing travelers with a personalized dashboard to manage their bookings.
- **Payment processing integration**, allowing secure transactions and automated booking confirmations.
- **Fully responsive design**, ensuring accessibility across various devices.

My Contributions:

- **Developed the frontend in React**, creating a modern, user-friendly booking experience.

- **Worked on integrating WordPress with React**, ensuring smooth data exchange between the two technologies.
- **Implemented UI components for trip browsing, booking, and payment processing.**
- **Collaborated closely with the WordPress developer**, resolving API and backend challenges to maintain performance and reliability.
- **Optimized performance and security**, ensuring a fast, scalable, and secure application.

Outcome:
Despite the complexity of integrating **WordPress and React from the ground up**, the application was successfully completed and later **acquired by an American investor**, demonstrating its **business potential and technical viability**.

COMPETITION PROJECTS OR HACKATHONS

2023 - CIRCLE EDGE - 1st Place (HackYeah 2023)

Together with my teammates **Marcin Gąsiorek and Filip Ambroży**, I participated in **Europe's largest hackathon, HackYeah 2023**, where we tackled one of the most complex challenges: **"HackSQL: Kołobrzeg - Kampus Kompetencji Przyszłości"**, a problem statement designed by the **Polish Development Fund (PFR)**.

The challenge resonated deeply with us, as it addressed **issues commonly faced by small-town communities**, an area we strongly related to. Over an intense **24-hour programming marathon**, we devoted our **skills, experience, and problem-solving mindset** to building a solution that could have real-world impact.

Key Aspects of the Project:

- **Designed and developed a data-driven system** to address local community challenges.
- **Implemented innovative database solutions**, optimizing data accessibility and management.
- **Created a user-centric platform**, ensuring efficiency and scalability.
- **Delivered a compelling final pitch**, effectively communicating the project's value and technical execution.

Despite starting without specific expectations, our **determination and teamwork** propelled us to the **finalist stage**, where we faced a demanding pitching session against strong competitors. Our **commitment to the project's vision, technical excellence, and presentation skills** ultimately led us to **victory, securing 1st place in the competition**.

This experience reinforced my belief in the power of **collaboration, innovation,**

and problem-solving under pressure. I am incredibly grateful to **my teammates, the HackYeah organizers, and the Polish Development Fund** for this **unforgettable experience**.

Link to linkedin post: Link

2022 - **ISS LOOKOUT** - Participation (NASA Space Apps Challenge 2022)

As part of the **NASA Space Apps Challenge 2022**, our team developed **ISS LOOKOUT**, a web application designed to **track the real-time location of the International Space Station (ISS)** while providing an interactive **simulation of the entire solar system**.

The project aimed to **enhance public engagement with space exploration** by allowing users to visualize the **historical and live positioning of the ISS** and explore details about its structure, mission, and crew members.

Key Features & Functionalities:

- **Live ISS tracking**, displaying the current position of the station in relation to Earth.
- **Full solar system simulation**, enabling users to recreate the position of all celestial bodies at any given moment.
- **Historical ISS evolution model**, showcasing structural changes to the space station over time.
- **Detailed module inspection**, allowing users to explore each part of the ISS with brief descriptions of their functions.
- **Astronaut presence tracker**, displaying which astronauts were aboard the ISS at different points in time.

My Contributions:

- **Developed the frontend and interactive UI**, ensuring a smooth and immersive user experience.
- **Integrated real-time space data APIs**, enabling accurate tracking of the ISS and celestial body positions.
- **Designed and implemented the orbital visualization system**, allowing users to explore historical and live ISS trajectories.
- **Optimized performance and responsiveness**, ensuring seamless functionality across multiple devices.

Outcome:
The project successfully **showcased the ISS in an engaging and educational manner**, making space exploration more **accessible and interactive** for users. The experience of working on this challenge reinforced my **skills in data visualization, API integration, and astronomy-based simulations**.

Link to repo: Link

Link to linkedin post: Link

2021 - **Bank Pipeline** – 3rd place (Asseco Poland Competition)

This project was developed as part of a **fintech competition organized by Asseco Poland**, where we designed and built a **blockchain-based international money transfer application**. The primary goal was to create a system that would enable **instantaneous and low-cost cross-border transactions**, eliminating the inefficiencies and high fees associated with traditional banking transfers.

Key Features & Functionalities:

- **Blockchain-powered transactions**, ensuring secure, transparent, and low-cost money transfers.
- **Instant cross-border transfers**, bypassing traditional banking delays.
- **Decentralized transaction validation**, reducing reliance on intermediaries.
- **Smart contract integration**, automating the transfer process while maintaining security and compliance.
- **User-friendly interface**, allowing seamless transactions between international accounts.

My Contributions:

- **Developed the backend infrastructure**, implementing secure transaction processing using blockchain.
- **Built the frontend interface**, ensuring an intuitive and efficient user experience for initiating and tracking transactions.
- **Implemented smart contracts**, enabling automated and tamper-proof money transfers.
- **Optimized transaction costs**, leveraging a cost-efficient blockchain network to minimize fees.
- **Ensured security and scalability**, designing the system to handle high-volume transactions securely.

Outcome:
Our **innovative approach to cross-border banking** earned us **3rd place in the competition**, demonstrating the potential of blockchain technology in **revolutionizing financial transactions**. The project reinforced my **expertise in fintech solutions, blockchain development, and decentralized applications**.
Link to article: Link
Link to video: Link

2021 - **Application to reduce air pollution** – Participation

This project was designed as part of a **smart city initiative**, aiming to promote **eco-friendly transportation** and **reduce urban air pollution**. The application provided a **dynamic city map** showcasing **points of interest for tourists** while simultaneously encouraging the use of **non-polluting transportation methods** through an **incentive-based system**.

Key Features & Functionalities:

- **Interactive city map**, displaying tourist attractions and eco-friendly transport routes.
- **Real-time air quality monitoring**, providing users with up-to-date pollution levels in different areas.
- **Eco-reward system**, incentivizing users to choose **public transport, bicycles, and walking** instead of traditional vehicles.
- **Gamification elements**, allowing users to **earn rewards and discounts** for reducing their carbon footprint.
- **Integration with local transport services**, suggesting the most environmentally friendly travel options.

My Contributions:

- **Developed the frontend interface**, ensuring an intuitive and visually appealing experience for users.
- **Implemented the backend infrastructure**, handling **real-time data updates and user activity tracking**.
- **Integrated air quality APIs**, allowing users to make informed decisions based on pollution levels.
- **Designed the incentive system**, encouraging sustainable transport choices through rewards.
- **Optimized performance and scalability**, ensuring a smooth experience across different devices.

Outcome:
The application was successfully **tested in a smart city concept**, demonstrating its potential to **improve urban mobility while reducing pollution levels**. It highlighted the impact of **technology-driven environmental solutions** in creating **sustainable and eco-friendly urban ecosystems**.
Link to video: Link

2019 - **Website** – Distinction (Webmaster is Me Competition)

This project was developed as part of the **"Webmaster is Me" competition**, where participants were challenged to **build a fully functional website within a limited time frame**. The competition did not have a predefined theme, requiring competitors to **quickly analyze, design, and implement a website for a randomly assigned industry**.

For my entry, I created a **medical-related web application**, designed to assist **doctors and healthcare professionals** with managing appointments and patient interactions.

Key Features & Functionalities:

- **Industry-specific website design**, tailored to the needs of healthcare professionals.
- **Appointment booking system**, allowing patients to schedule visits.
- **Responsive and accessible UI**, ensuring usability across devices.

- **Optimized performance**, meeting the competition's efficiency and scalability criteria.

My Contributions:

- **Designed and developed the website from scratch within the competition time limit**.
- **Implemented frontend and backend components**, ensuring full functionality.
- **Optimized UI/UX for a professional and user-friendly experience**.
- **Ensured accessibility and cross-browser compatibility**.

Outcome:
My project was **recognized with a distinction**, demonstrating **technical proficiency, problem-solving skills, and the ability to deliver a high-quality product under time constraints**. The competition, organized by the **Technical Institute in Dobczyce**, provided valuable experience in **rapid development and industry-specific web design**.

2019 - **Digital Olympics**– Participation

I participated in the **Digital Olympics**, a nationwide IT competition organized by the **Ministry of Education in Poland**. The competition consisted of **multiple stages**, testing participants on a **wide range of IT-related topics**, including **programming, networking, cybersecurity, database management, and software engineering principles**.

Key Aspects of the Competition:

- **Multi-stage format**, requiring extensive knowledge across various IT domains.
- **Challenging theoretical and practical tasks**, covering **algorithms, system administration, and IT security**.
- **Problem-solving assessments**, evaluating analytical thinking and programming efficiency.

Outcome:
Competing in the **Digital Olympics** provided an opportunity to **test and expand my technical knowledge** in a competitive environment. The experience reinforced my **problem-solving skills, adaptability, and deep understanding of various IT disciplines**.

2019 - **Application for people with disability**– Distinction

This project is one of my **most meaningful achievements**, as it was designed to assist **people with hearing or speech impairments** during the pandemic by enabling **seamless communication in virtual meetings**. The application utilized **artificial intelligence** to **convert sign language into text and speech**, allowing participants to actively engage in **remote conversations on platforms like Teams and Zoom**. Additionally, it featured **speech-to-text conversion**, ensuring accessibility for users with different communication needs.

Key Features & Functionalities:

- **AI-powered sign language recognition**, translating hand gestures into **real-time text and speech output**.
- **Speech-to-text processing**, converting spoken words into **on-screen captions and sign language animations**.
- **Real-time meeting integration**, ensuring full participation in virtual conferences and online discussions.
- **User-friendly interface**, designed for **accessibility and ease of use**.
- **Support for multiple languages**, expanding inclusivity across different regions.

My Contributions:

- **Developed the core AI-based recognition system**, ensuring accurate conversion of **sign language gestures into text and audio**.
- **Implemented speech-to-text processing**, optimizing real-time transcription for online meetings.
- **Designed an accessible UI**, allowing users to easily configure settings for their individual needs.
- **Ensured compatibility with major video conferencing platforms**, integrating with **Teams and Zoom**.

Outcome:
The project was awarded a **distinction** in a competition organized by the **Technology Park WSEI in Kraków**, recognizing its **potential to significantly improve accessibility for people with disabilities**. The solution demonstrated how **AI and assistive technology** can bridge communication gaps and **enable full participation in digital society, especially during remote work and learning environments**.
Link to article: Link

2017 - Mobile App for diabetes – 1st place

I developed a **mobile application for diabetes management**, designed to assist diabetics in **tracking their health data and receiving personalized recommendations** based on their inputs. The app provided users with an easy way to **log essential health metrics**, which were then analyzed to suggest appropriate actions.

Key Features & Functionalities:

- **Health data tracking**, allowing users to input glucose levels, meals, physical activity, and medication intake.
- **Automated analysis and recommendations**, providing personalized advice on diet, exercise, and insulin dosage adjustments.
- **User-friendly mobile interface**, ensuring accessibility for people of all ages.
- **Data visualization**, enabling users to track trends and progress over time.
- **Secure data storage**, ensuring privacy and compliance with medical

data standards.

My Contributions:

- **Designed and developed the entire mobile application**, implementing both frontend and backend logic.
- **Created the health analysis algorithm**, processing user input and generating **real-time recommendations**.
- **Optimized the UI/UX**, ensuring a smooth and intuitive experience.
- **Implemented secure data handling**, protecting sensitive health records.

Outcome:
The project won **1st place in a competition organized by Comarch**, recognizing its **innovative approach to digital healthcare**. The app demonstrated the **potential of mobile technology in supporting people with chronic conditions**, providing a **practical and effective tool for diabetes management**.

2017 - **Mobile App for diabetes** – 2st place

Following the success of my **diabetes management application**, I continued to **enhance and refine** the project in my free time, improving its functionality and usability. This ongoing development led me to participate in another competition, where the app was recognized with the **audience award**, highlighting its **practical value and impact**.

Key Features & Enhancements:

- **Improved health data tracking**, allowing more detailed input of glucose levels, diet, and physical activity.
- **Enhanced recommendation system**, refining AI-driven suggestions for better diabetes management.
- **Custom alerts and notifications**, reminding users to monitor their health and take necessary actions.
- **User feedback integration**, improving usability based on real-world diabetic needs.
- **Performance and UI/UX optimization**, making the app more intuitive and accessible.

My Contributions:

- **Further developed and refined the application**, improving accuracy and functionality.
- **Integrated user-driven feedback**, ensuring the app met the needs of diabetics.
- **Presented the project at the competition**, demonstrating its real-world impact and usability.

Outcome:
The application received **2nd place and the audience award** in a competition organized by the **Krakow Technology Park**, reflecting its **usefulness and**

innovation in digital healthcare. This experience reinforced my passion for **building technology-driven solutions that improve people's lives**.

2017 - Mobile App for notifications between family – 2st place

Building upon my **diabetes management application**, I developed a **companion app** designed to **enhance communication between diabetics and their families**, ensuring that loved ones were always informed about their relative's health status. This application introduced an **automated alert system**, which provided real-time updates and emergency assistance when necessary.

Key Features & Functionalities:

- **Family notification system**, allowing users to share real-time health updates with their relatives.
- **Automated emergency calling**, triggering a distress call with a **pre-generated health transcript** if critical health thresholds were detected.
- **Seamless integration with the diabetes management app**, ensuring synchronized data tracking.
- **User-configurable alerts**, enabling customization of notification frequency and emergency response settings.
- **Voice-assisted emergency system**, reading out health details during distress calls to facilitate quicker assistance.

My Contributions:

- **Designed and developed the mobile application**, ensuring smooth integration with the primary diabetes app.
- **Implemented real-time data synchronization**, allowing instant updates between users and their families.
- **Created the automated emergency call system**, ensuring quick response in life-threatening situations.
- **Refined UI/UX for accessibility**, making it easy for both **patients and caregivers** to navigate.

Outcome:
The project won **2nd place** in a competition organized by the **Communications School Complex in Krakow**, earning recognition for its **life-saving potential and contribution to digital healthcare**. It demonstrated how **technology can be used to provide security, reassurance, and immediate assistance** to those managing chronic illnesses.

Link to article: Link

UNIVERSITY PROJECTS

2022 - Sci Fi game based on fithft dimension – Unity, C#

As part of my **Engineering Thesis**, I am developing a **5D sci-fi game**, an

ambitious project that challenges the limitations of traditional game engines like **Unity**, which natively supports only **2D and 3D environments**. To achieve this, I had to **rewrite Unity's mathematical functions** and implement my own, allowing for the representation and interaction of **five-dimensional space** within the game.

Key Technical Challenges & Solutions:

- **Custom mathematical framework**, redefining Unity's built-in functions to support **5D transformations and spatial calculations**.
- **Physics-based interactions**, incorporating advanced **mathematical theorems and physics models** to simulate movement and mechanics in a higher-dimensional space.
- **Non-Euclidean geometry integration**, allowing for **unconventional spatial manipulations** that go beyond traditional game design.
- **Player navigation system**, enabling seamless movement between **different dimensional layers**, creating a unique gameplay experience.
- **Graphical rendering optimizations**, ensuring the game remains visually immersive and computationally efficient despite the increased complexity.

My Contributions:

- **Developed a custom mathematical engine** to simulate interactions in five-dimensional space.
- **Implemented core gameplay mechanics**, allowing players to experience and navigate a 5D environment.
- **Studied and applied advanced physics and mathematics** to ensure a theoretically sound representation of an additional spatial dimension.
- **Explored the intersection of science, game development, and immersive storytelling**, deepening my understanding of **multi-dimensional physics and computational geometry**.

Outcome:
This project has significantly **broadened my expertise in physics, mathematics, and game development**, reinforcing my passion for **creating innovative and experimental digital experiences**. Working on this **engineering thesis** has deepened my appreciation for the **multi-disciplinary nature of game development**, combining **science, programming, and creative design** into a **highly technical yet artistic endeavor**.

PRIVATE PROJECTS

2022 - **Game Engine** – Typescript

Driven by my deep interest in **game development** and a desire to understand the **inner workings of game engines**, I took on the challenge of **building my own game engine from scratch**. The engine is **written in TypeScript** and utilizes **WebGL** for rendering, allowing for efficient real-time graphics

processing directly in the browser.

Key Features & Functionalities:

- **Custom rendering pipeline**, built with WebGL, supporting **real-time 2D and 3D graphics rendering**.
- **Entity Component System (ECS) architecture**, enabling flexible and scalable game object management.
- **Physics engine integration**, handling object collisions, movement, and environmental interactions.
- **Shader programming**, optimizing graphical effects and improving performance.
- **Input handling and game loop optimization**, ensuring smooth gameplay experiences.

My Contributions:

- **Designed and developed the core engine architecture**, handling rendering, physics, and game logic.
- **Implemented a real-time rendering system**, utilizing WebGL for **efficient graphics processing**.
- **Optimized performance and memory management**, ensuring smooth execution in web environments.
- **Explored low-level graphics programming**, gaining a deeper understanding of **how modern game engines function**.

Outcome:
Building my own **game engine** provided a **hands-on understanding of graphics programming, game architecture, and performance optimization**. This experience not only **deepened my technical knowledge** but also reinforced my passion for **game development and engine design**, laying the groundwork for future projects in the field.

2019 - Application for finding a good doctor – React, NodeJS

This project was inspired by **"znanylekarz.pl"**, a platform that primarily gathered **doctor reviews and ratings**. However, I identified an **opportunity to extend its functionality** by incorporating an **appointment booking system**, transforming it into a **fully functional medical scheduling platform**.

Key Features & Functionalities:

- **Doctor search and filtering system**, allowing users to find specialists based on reviews, specialization, and location.
- **Online appointment booking**, enabling patients to schedule visits directly through the platform.
- **Automated reminders and notifications**, improving patient engagement and reducing missed appointments.
- **User-generated ratings and feedback**, helping users make informed healthcare decisions.
- **Secure authentication and data protection**, ensuring compliance with

medical privacy regulations.

My Contributions:

- **Designed and developed the full-stack application**, implementing both frontend (React) and backend (Node.js) functionalities.
- **Implemented a dynamic booking system**, optimizing appointment scheduling for efficiency and usability.
- **Developed unit tests**, learning to apply **robust testing strategies** for high-quality, maintainable code.
- **Gained experience in managing large-scale projects**, handling complex **data structures and business logic**.

Outcome:
This project provided valuable **hands-on experience in managing demanding applications**, reinforcing my understanding of **unit testing, project scalability, and user-centered design**. It highlighted the **potential of technology in improving healthcare accessibility** and deepened my expertise in **building secure, high-performance web applications**.

CERTIFICATES & BUSINESS EDUCATION

2025- MBA: Master of Business Administration – Warsaw Business School

Credential ID AK/12268/25
A 180-hour business education program focused on core competencies in leadership, project management, strategic planning, marketing, public relations, HR, CSR, and negotiation.

Key Modules: Marketing, Business Strategy, Networking, Ethics, Project Management, Human Resources, and Negotiation in Business.

Delivered in collaboration with Niepubliczna Placówka Kształcenia Ustawicznego and endorsed at European level.

2020- 98-364:MTA: Database Fundamentals – Microsoft

Credential ID wL8uY-FMLX
Core certification demonstrating understanding of database concepts, normalization, relational database structures, SQL syntax, and CRUD operations. Covered concepts such as data storage, indexing, relationships, and security within relational databases like SQL Server.

2020- 98-375:MTA: HTML5 Application Development Fundamentals – Microsoft

Credential ID e3MX-4Tkj
Confirmed skills in developing cross-platform applications using HTML5, CSS3, and JavaScript. Topics included responsive layouts, multimedia integration,

UI/UX principles, DOM manipulation, and client-side storage.

2020- 98-361:MTA: Software Development Fundamentals – Microsoft

Credential ID wy54W-4Smb
Provided a foundation in core software engineering concepts, including algorithms, object-oriented programming (OOP), application lifecycles, error handling, and software design patterns using languages like C# and JavaScript.

2020- 98-367:MTA: Security Fundamentals – Microsoft

Credential ID J26m-FVpD
Validated understanding of key cybersecurity principles: network security, authentication, authorization, encryption, threat mitigation, device hardening, and operational security practices. Covered both physical and logical security aspects.

2017- Front-End Developer – Academy 108

Comprehensive bootcamp certification in modern frontend development. Covered core technologies including HTML5, CSS3, JavaScript (ES6), jQuery, Bootstrap, and responsive web design techniques.

Emphasized UX/UI fundamentals, pixel-perfect design implementation, browser compatibility, and client-side scripting.

CONFERENCES

2024- Code Europe – Kraków

Attended Poland's largest technology conference featuring talks from world-class software engineers, architects, and tech leads. Focused on topics such as cloud-native applications, AI in software engineering, modern web architecture, and advanced DevOps practices. Participated in networking sessions and deep-dives into TypeScript, Kubernetes, and scalable systems design.

2023- Code Europe – Kraków

Engaged in technical sessions on advanced microservices architecture, cloud automation, and performance optimization. Gained insights from senior engineers at global tech companies and participated in live coding workshops around JavaScript, AWS, and CI/CD pipelines.

2022- Code Europe – Kraków

Focused on hands-on workshops and engineering keynotes covering frontend frameworks (React, Angular), TypeScript patterns, state management, and progressive web apps. The event also highlighted emerging trends in developer tooling and cross-platform development.

2022- Tech OpenX Meetup – Kraków

Attended OpenX's engineering meetup covering topics in real-time bidding, high-frequency backend processing, cloud architecture, and big data pipelines. Sessions included use cases from production systems in the adtech industry.

2022- RevDev – Kraków

Participated in an engineering-driven event focused on developer productivity,

continuous delivery, and modern backend architectures. Attended technical deep-dives into observability, event-driven microservices, and scalable API development.