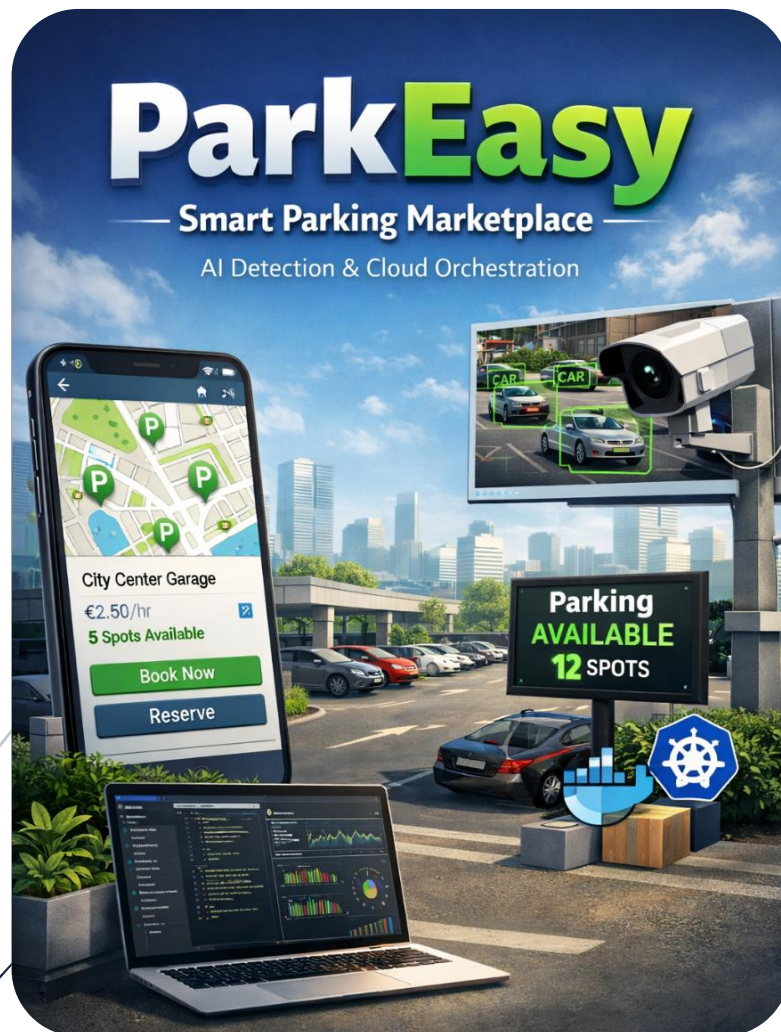


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ParkEasy project reflection

KubeMeIn Project



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Project Reflection – ParkEasy

The ParkEasy project was developed over a period of three months by the two of us, Aristide and Kim. The goal was to build an intelligent parking management system that combines a web platform, computer vision, and cloud technologies. From the very beginning, we tried to treat the project as a real-world software project rather than a purely academic assignment. This meant thinking ahead, making design choices early, and accepting that not everything would go exactly as planned.

Before writing any code, we spent time discussing the overall architecture of the system and especially the database design. This turned out to be one of the most important decisions we made. Designing the database schema together gave us a common foundation and allowed us to work in parallel without constantly blocking each other. Having a shared and well-structured database model made later integration between components much easier and avoided a lot of reworks.

To organize the project, we used ClickUp as our main project management and documentation tool. We created a backlog containing user stories, technical tasks, bugs, and research spikes, and we worked in two-week sprints. Each sprint had a clear goal and was documented with sprint planning, review, and retrospective notes. Using this structure helped us track progress over time and break the work into manageable pieces. We also relied heavily on ClickUp Docs to document meetings, troubleshooting, time tracking, and technical knowledge, which helped ensure that important information was not lost and could be reused later.

Once the planning phase was finished, the responsibilities were clearly split. Aristide focused on the marketplace, backend logic, and web interface. This included implementing user flows, building APIs, connecting the database, and making sure that both drivers and parking owners could interact with the system in a functional and intuitive way. Kim focused on the parking detection system and the computer vision part of the project. His work involved integrating YOLOv8, testing different model variants, and building tools to extract frames, annotate data, and evaluate detection accuracy.

A lot of effort was spent on making the detection system stable and reliable. To avoid flickering or inconsistent results, Kim implemented rolling buffers, consensus logic, hysteresis thresholds, and a spot tracking system. A polygon overlap checker was also developed to ensure that detected vehicles were actually inside the defined parking spots. All of these components were necessary to provide availability information that users could trust.

The good aspects of the project were mainly related to organization and teamwork. The early planning, clear task distribution, and use of ClickUp with sprints and documentation helped us stay structured throughout the project. Using Docker from the start also made integration easier and reduced environment-related issues. Keeping troubleshooting logs and knowledge resources proved useful when problems reappeared later in the project.

The less good aspects were related to time estimation and integration. Some tasks were initially too large and had to be split during the sprint, which made planning less accurate. In addition, integrating components that worked well on their own often took more time than we expected.

The biggest challenge of the project was finding the right balance between experimentation and delivery. We spent a significant amount of time on side experiments, such as trying to automatically detect parking spot polygons using AI instead of configuring them manually. Even after experimenting with different approaches and training Detectron on a large dataset, the

results were not reliable enough, and the idea had to be abandoned. While this was frustrating, it was also an important learning experience.

Overall, ParkEasy was a challenging but very rewarding project. We learned a lot about teamwork, system integration, computer vision, and cloud deployment. Most importantly, we learned that good organization and communication are just as important as technical skills when working on a complex project under time constraints.