Simplified Online Parking System

Spring 2019 - Group 9
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Yasir Bhuiyan
Samhita Ghosal
Mu Ge
Cheng Yu
Anh Tuan Le

Brief Resumes

Yasir Bhuiyan:
Student at Georgia State University, graduating Spring of 2019, with a Bachelor of Science in Computer Science. Related coursework includes experience with database systems, machine learning algorithms, and assembly programming. Proficient languages include C, Java, Python, and Julia. Relevant work experience in programming embedded systems with C, as well as programming mobile apps in Java.

Samhita Ghosal:
Fourth-year college student at Georgia State University and major is the Bachelor of Science: Computer Science. Well versed in computer science. Related coursework includes studies of basic java, assembly language, Unix, C programming, python and socket programming. Acquired knowledge of computer architecture, cyber security and the theoretical understanding of the background of coding and understanding of all sorts and methods. Well efficient in using eclipse, virtual studios, ubuntu, wireshark, and virtual machine. Can offer concrete critical thinking and problem-solving skills

Mu Ge:
I am now a graduate student of computer science. I have already got my bachelor degree in Electrical and Computer Engineering. I used to do projects using C language, Java, Python and I know a little about assembly language. I am familiar with Windows and Linux/Unix environment, as well as virtual machine (VMware). Also, I have used some program/framework to help me with the program developing, such as Docker, Apache Spark. I have some algorithm development experience on machine learning, regression and graph theory and have some related knowledge of testing or validating. Plus, I had some software testing working experience in industry, that might be helpful while doing a project.

Cheng Yu:
I am the college student at Georgia State University and the minor of Computer Science. Most of projects I used the c, java, c# programming to work on my project. Have some knowledge of computer architecture the computer security. Also, I had some experience work and code on the linux. Most of time I use the eclipse. Had experience work the project on the blender, have some experience create the 3d model and the project on the blender. A few knowledge about the computer vision and graphics.

Anh Tuan Le:
I am currently a Senior student at Georgia State University pursuing a Bachelor of Science in Computer Science here. I am familiar with languages such as Java, C, Python. I have experiences with Object Oriented Programming, Virtual Machines, Data Structures as well as Algorithms during my courses. I mainly use Java to code to solve problems, doing projects. Also quite familiar with Eclipse, Intellij IDEA, Virtualbox.

Scheduling and Planning Table

Assignee Name	Email	Task	Duration (hours)	Dependency	Due Date	Note
Yasir Bhuiyan	ybhuiyan1@student.gsu.edu	Github creation, report formatting and editing	2-3 hours	Content from rest of group mates for final formatting	02/01/19	
Samhita Ghosal	sghosal2@student.gsu.edu	Summarize teamwork basics	2-3 hours	none	02/01/19	
Mu Ge	mge3@student.gsu.edu	Report writing/editing	2-3 hours	none	02/01/19	
Cheng Yu	cyu9@student.gsu.edu	Context model creation	2-3 hours	none	02/01/19	
Anh Tuan Le	ale42@student.gsu.edu	Problem statement	2-3 hours	none	02/01/19	

Teamwork Basics

We must discuss different norms to set some ground rule. These norms could lead not just a successful outcome but efficient team work. First norm is the work norm of the group. It's important that everyone is partaking in every assignment. Whenever an assignment has been assigned, we will first come together as a group and each member can decide which part they want be involved in. If there are remaining parts that hasn't been assigned to anyone, then the members who weren't able to make it to the meeting will take over those parts. Each part will have an assigned deadline and the facilitator will set those deadlines. They will let the participants know when the portions of the assignments need to be done. Every member will get a remainder as to when a part is due. There will be times when an individual will not follow through his/her commitments and that could hamper the progress of the group. Because of this, this member will be penalized by receiving a zero on their part of the assignment. To prevent this from happening in future assignments, the team coordinator will discuss with the member on why they received the zero and make sure that they follow through with their commitments in the next assignments. Once every member has done and turned in their part, the team coordinator will go through, review and edit. To have good teamwork, it is crucial to hear everyone's opinions and idea. If a member has a different approach to the quality of the work, then he/she must express the ideas to the group. Then the group will compromise and reach to a final decision. People in the group will have different work habits and that could affect the group's progress. To accomplish the goal of the assignment, we must be efficient and thorough, rather than procrastinating in the last minute.

Another norm to discuss is the facilitator norm, which is when a people can ease the process by planning, guiding and managing the group so that they can have their objectives meet effectively. Using a facilitator can lead the team work to success by making a creative process and work environment more promising. They can help the group reach a decision, solution and/or conclusion. A facilitator is chosen if that individual has a lot of mental effort and have the interest, skills such as leadership and experience that can help achieve the goal of the problem. For all the members to participate, the team must rotate the position of the facilitator. This can help create a positive team culture by

transposing an unproductive dynamic. Members can develop new skills and build a strong bond with one another. There are several responsibilities when it comes to a facilitator. This includes designing and planning the right and effective tools that can help the group to go toward a successful outcome. To guide and control the group's progress by ensuring that every individual is participating, and they have a mutual understanding of what the purpose of the goal is. They could take into consideration of other member's idea, solution and decision. And make sure all the members take the shared responsibility for the outcome.

The key to the success in a team is through communication. Communication norms involve where should the communication be taken place and through what medium. Occasionally we will meet as a group and those who partake in this meeting will have elaborate discussion on their ideas and thoughts about the project. But most communication will go through an app called GroupMe, where questions or concerns can be answered. This is also beneficial to those members who are not able to attend the meeting due to their class/work schedule. This is a great way to update them on what the members have discussed. One of the members, Samhita describes an experience about the benefits of having a communication medium. In her computer network class, they had to create TCP and UDP sockets and everyone had their own responsibility for the project. Unfortunately, one of the members was going through medical attention so she/he couldn't come to group discussions. But she/he could get all the information, updates, etc., through group chat and skype. These discussions weren't authentic as meeting person, but it helped them get their task done, created a bond with members and led to a successful outcome.

To achieve the outcome, meetings are very important especially when there are series of ideas and thoughts being expressed and it creates a bond with all the members. Because of time conflict due to member's classes and work, everyone has different schedule. The facilitator must be responsible for coordinating meetings, so they can see the progress and can help others if there any confusion. Most of the members can meet on Monday and Wednesday, before class. A good place to have meeting is very important. The place must be less crowded, especially when important discussions are taking place. A place where every member can meet. And it's available and free. It is understandable if a person comes late to the meeting, especially due to our different schedules. If there is still time in the meeting, the other members can help by giving a gist of what the group has discussed. Otherwise, the information of the discussion will be updated on our group chat. The group chat is also beneficial to those who couldn't make it to the meetings at all. But if there comes a point where a group member doesn't come to several meetings and makes zero effort on their task, this member will receive a zero on their behalf. If this problem extends, then the professor will get notified. Meeting up and making effort is very essential when it comes to teamwork. For example, one of the members, Mu Ge, had an unfavorable experience while working in working pertaining to facial recognition. He stated because of the lack communication and scheduling, he had to do most of portion of the project by himself. This created a lot of chao and not efficient team work.

The last norm to discuss is the consideration norm. These norms involve whether people can eat and/or smoke during meetings. It is highly inappropriate for someone to do these actions especially if the place where the group meets discourages it. This can cause distraction by preventing the group to get their thoughts across and having an appropriate discussion. Sometimes, people's behavior needs to be taken into consideration as well. For instance, someone can dominate the whole discussion and not let others express their opinions and ideas. It's important for all members to participate and be involved. But there are times, when a member is overly passionate about the discussion and only give his/her ideas while discarding others. The facilitator should be able to control this situation. The facilitator can set the tone and manage the flow of the conversation. They should discourage back and forth confrontation because that disturbs the flow of the conversation. Make sure all ideas, opinions and concerns are expressed. Make sure member are not being side-tracked and discard any negative comments. If the situation gets out of control, then the facilitator should converse with the person privately to help them understand the consequences of their actions. It is important to make sure every person in the group is comfortable with what is going on in the group. Norms can be changes if they are not pleased with how the work is distributed, who the facilitator is, place where the meeting hold, etc. The person can express their concerns with the group or the team coordinator and the group can come up with a solution.

Group Work Experience from Samhita:
I used to do a group project about facial recognition using machine learning methodologies. I was the coordinator of the group and we had another two group members. However, since the lack of communications and the bad scheduling of the time, we did it in a rush in the end. I basically did most of the coding tasks, including model setting up, code debugging, testing and validating, which was the most important and toughest part through the whole project. I would say it was a bad experience of group working since I expected that everyone could split all of the tasks and could get at least any coding assignments. I think the bad communication and time scheduling lead to a bad cooperation that I had to do most of the job. From then on I realized how important teamwork is.

Group Work Experience from Yasir:
I worked on a image classification project using neural networks with a group, for a class here at GSU. We did not have a set group structure with a team coordinator. Most communication was done online, with minimal in person meetings. The actual meetings mainly consisted of normalizing the development environment for everyone, so the project would run on everyone's system the same. We did not use a collaborative version control software, like Github, sending project files to each other online using Discord. Overall, communication was bad, and the methodology for collaboration devolved into everyone doing the initial work themselves, which included data preprocessing as well as the creation of the first neural network. Once this was done, the group then chose the best work and we proceeded with modifying that. My work ended up being the best so we went forward with mine, but because we didn't collaborate from the beginning, the rest of the group had difficulty working with my code so I ended doing most of the work overall.

Problem Statement

The goal of this product is to create an automated parking service that will handle payment and tracking of parking lots and streetside parking throughout the city. The service is largely map-based, with a large portion of the main UI consisting of one. Parking lots and spaces are divided into zones throughout the city, each of which are viewable on the map. Once you find your parking space, you should be able to find a zone number displayed nearby, or just pull up the map to see which zone you are in. From here, a user would be able to pay for parking for a certain time. If the user is away, they should be able to reload their parking time as well, if that is to be allowed in that zone. Each zone will keep track of how many spaces are open, allowing for more flexible planning beforehand for parking options. Each user will have a "Garage" of cars their account is linked to, to allow for easy switching between multiple vehicles.

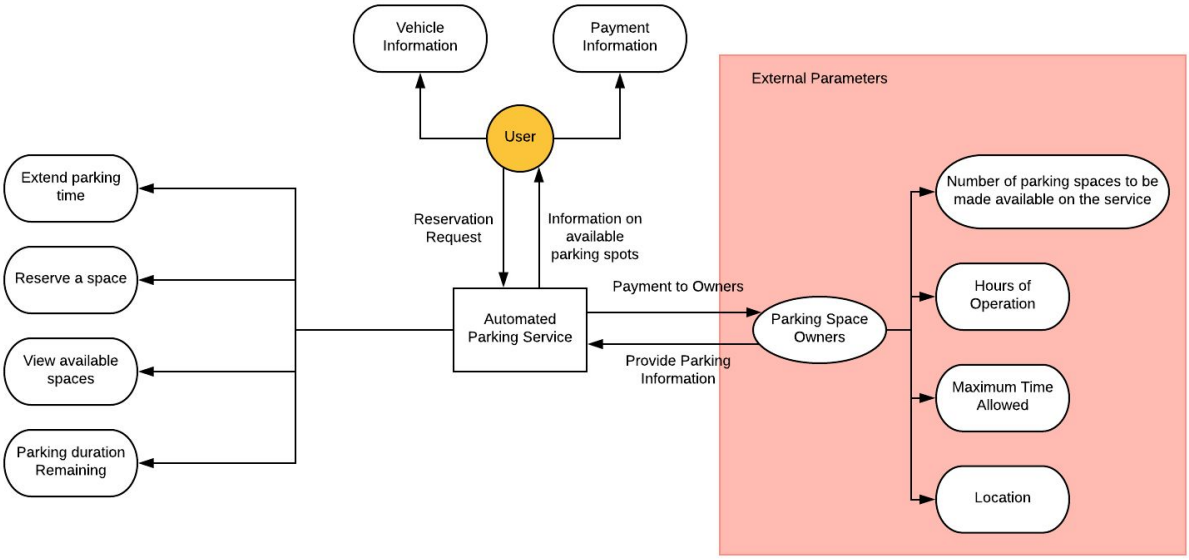
The user base should consist of anyone who needs parking in downtown Atlanta. Atlanta is widely known as a commuter heavy town, so the service should, in theory, garner a large volume of users. Even with the tons of parking around town, finding an actual empty space can sometimes be a difficult task. Current parking systems are outdated and not user friendly. In some places around town, the only way to pay is still cash, causing parking to be highly cumbersome. This service aims to making parking a much quicker, more efficient, and more convenient task. This may lead to shorter times driving around looking for an empty spot, helping to save on gas and reduce congestion on the streets. By using the parking availability feature in the service, a user may directly type in the address of an open parking spot into their GPS and head directly there.

There are other similar services out there, but none of them cater specifically to downtown Atlanta. Downtown Atlanta is a unique area, with lots of paid parking decks, metered street parking, and many students and businessmen. It is a frequent event to have to drive around the city aimlessly looking for parking, so, in a city with one of the worst traffic problems in the country, cutting down on drivers would help alleviate the problem.

Technically, the project should be feasible. The project should be created on a web platform, with compatibility with both desktop browsers and mobile browsers. Google Map's API can be used as the basis for the main UI. We have members in the group that are familiar with using the API, so that is a plus. A backend system

will need to be created to house information on each zone and each user, as well as log each parking event as it happens. The service should be able to send notifications to the user, whether it be push notifications or email. The service should be able to adapt and scale to different parking types, from street parking to small parking lots to parking decks with hundreds of parking spaces. Going forward, a suitable web hosting platform will need to be decided on, as well as a framework for creating the website itself.

Context Model



Appendix