Enjoying Theme Parks: Disneyland

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Abstract

This paper will outline realistic expectations for what to expect when visiting a theme park. The purpose of this paper is to give interested readers a rough estimate on the expected total time and energy commitment when planning to spend a day at a popular tourist location. Disneyland is used here as an example that hopes to serve as a useful comparison for other popular theme parks.

1. Introduction

In today's world, efficiency is everything. As technology gets better and faster, we strive to move and live quicker just to keep up. With that however, comes the desire to treat and enjoy yourself once in a while by slowing things down. It is hard to schedule a vacation or a trip with family or friends, but it is fair to assume that we want our experience to be the best it can be in the little time that we do have for pleasure and relaxation. What is a good (and common) way to do this? Take a trip to a theme park!

So you're planning a trip to a theme park, where do you want to go? Going rate for a day at Disneyland? $96. How about Universal Studios? $92. Sea world? $84. Yikes. That has the potential to turn into an expensive vacation very quickly. Okay, well what all can I do at these places? Well, Disneyland itself offers over 20 rides for visitors. That means you have *2,432,902,008,176,640,000* riding possibilities for rides that have fluctuating wait times that constantly change due to the ever changing population density of the park. This does not even account for any shows, parades, restaurants, or other venues found scattered through the park that you could find yourself doing throughout the day.

With so many great options in front of you, it could prove a little overwhelming to plan an expensive trip to a place known for fun, and be unsure of if you will be able to maximize the enjoyment of your experience. While there's exists no perfect plan when visiting theme

parks, a close analysis of a day at Disneyland during one of its busiest times of the year will help unearth some critical tips and tricks that could help make or break your visit to a theme park.

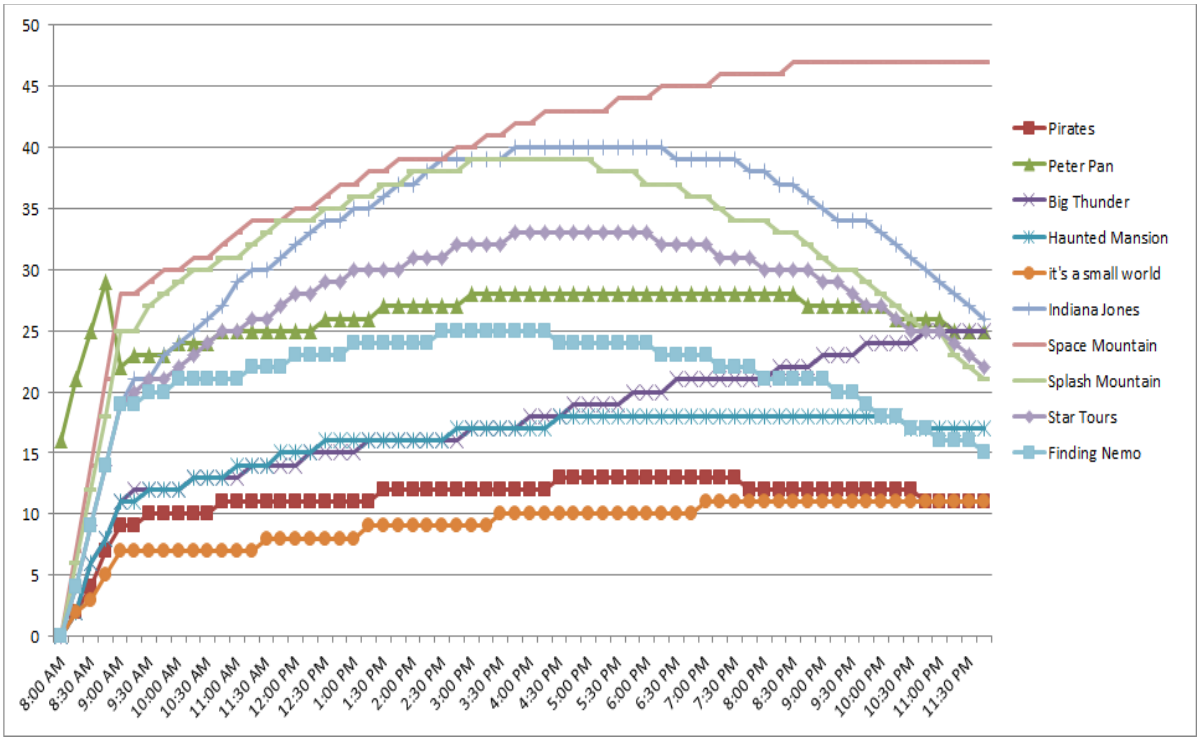
2. Model

This paper outlines a single day visit to Disneyland in California for different types of park-goers. Ten different attractions of varying design and experience were chosen thru a compilation of rankings, reviews, and personal experiences. The attractions included are: Pirates of the Caribbean, Peter Pan's Flight, Big Thunder Mountain Railroad, Haunted Mansion, It's a Small World, Indiana Jones Adventure, Space Mountain, Splash Mountain, Star Tours: The Adventure Continues, and Finding Nemo Submarine Voyage. Four different approaches to theme park tourists are provided, and potential implications are explained for each selection.

3. Data

All data provided is courtesy of Len Testa at touringplans.com. Actual attraction waiting times were provided for Friday, June 21st, 2013. The significance of this day is that it happens to fall during Disneyland's busiest time of the year, along with Spring Break and the Christmas holiday season. In doing so, the data helps put forth a scenario that may seem unattractive to actually experience by a visitor themselves, but more importantly can serve as a reference for those who are visiting during a time of the year that is not known to be as crowded.

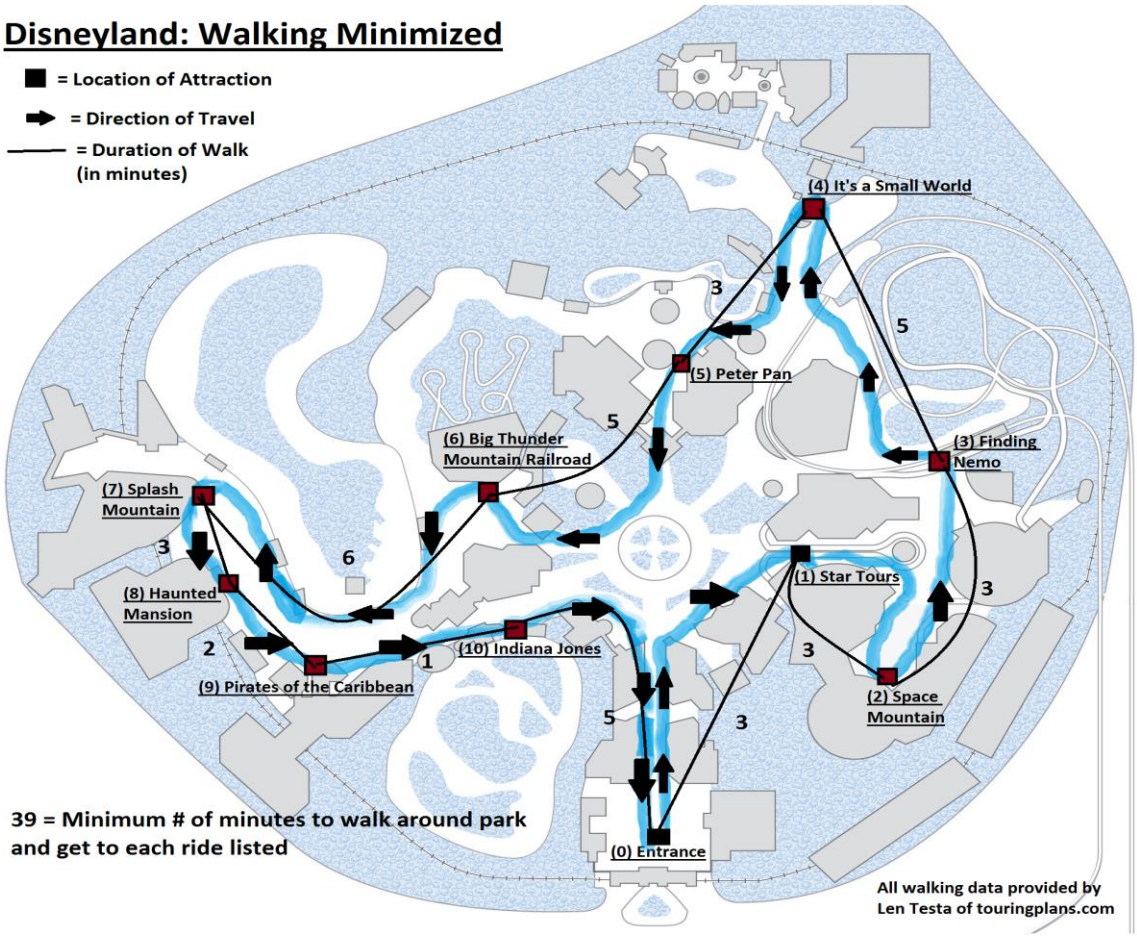
Disneyland Attraction Waiting Times on June 21, 2013 (minutes)



4. Methods

Traveling Salesman Problem Algorithm

Starting from the entrance, we choose the closest ride via our walking data. In the event of a tie between distances, we add on the next closest ride to each attraction until the tie is broken. This process is continued until the minimum walking path is found.



"Hate Waiting"

Don't like waiting in line? Join the club, because neither does anyone else. Ride wait times can single-handedly ruin a visitor's experience at a theme park. This park plan attempts to hit all of the rides with longer wait times at the beginning of your park visit, disregarding location within the park.

Random Visitor

A random route of attraction visitation of the standard ten (10) rides was generated and executed to simulate park visitors that walk into parks, grab a map of the park, and have

no method or reason for any attraction that they choose to go to. From the outset, one would expect this method to be long, inefficient and tiring – all things that should make a potential visitor plan adjust their strategy if they were planning on taking this route.

"Do it again!"

Some people know exactly what they do and do not like. This park approach attempts to include guests who operate under that standard, by removing two rides from the selection process (randomly) and randomly replacing them with the repetition of two other rides. So there are only eight different rides being visited by our guest in question.

5. Data Analysis

Since a specific ride wait time is constantly fluctuating at any given moment anywhere in the park, it is important to look at how different entry times of the day can alter your whole day. For each method, the path throughout the park at a selected time was done manually, as a way to provide interested minds the ability to look at things personally if they choose to do so. This route was chosen over implementing a program in the hopes that people would realize that their experience is entirely up to them, and can change drastically with any switching of rides, arrival times, or anything else. For simplicity, breaks were not added at a specific time, but instead were doled out based on if the visitor had hit a certain time threshold. *(See attached files for complete catalog of data)*

RANDOM							
	TIME AT BEG	CURRENT	TIME @ RIDE	DURATION	FINISHED	WALK TO NEXT	
8AM		WAIT TIME		OF RIDE		RIDE	
ENTRANCE	8:00AM					3	
STAR TOURS	8:03	0	8:03	7	8:10	4	
INDY	8:14	4	8:18	10	8:28	5	
SPLASH	8:33	14	8:47	11	8:58	9	
PETER PAN	9:07	23	9:30	3	9:33	5	
BIG THUN	9:38	12	9:50	4	9:54	2	
PIRATES	9:56	10	10:06	15	10:21	8	
SMALL	10:29	7	10:36	14	10:50	5	
NEMO	10:55	21	11:16	13	11:29	3	
SPACE	11:32	33	12:05 PM	5	12:10	9	
HAUNTED	12:19	15	12:34	9	12:43	5	
EXIT	12:48	***TOTAL RIDE WAIT TIME***				***TOTAL WALK TIME:***	
		139	min			58	MIN
TOTAL TIME TO FINISH RIDES:		4 hr 48 min		**BREAKS:**	1 hr12 min		
TOTAL TIME OVERALL:		6 hr 0 min	(2:00 PM)	AVG. MINUTES ELAPSED PER RIDE			36

6. Results

BREAKS: For every hour that is spent in the park, this model requires that a fifteen (15) minute break be taken. This is to help account for any potential detour you may come across as you move through the park. Maybe the visitors got lost, wanted to shop for souvenirs, took a break for rest or a meal – doesn't matter. In my experience I feel that this is an adequate amount of time for down time and is a realistic representation of visiting a theme park.

Traveling Salesman Approach: Simulates a park visitor that has a course of action upon entering the theme park. Minimizes time spent walking, but is blind to wait time.

ARRIVAL	ALL RIDES COMPLETED	BREAKS	ACTUAL FINISH	LINE WAIT	TIME PER RIDE (AVG.)	***WALKING TIME***
8:00 AM	4 hr 42 min	1 hr 10 min	1:52 PM	2 hr 45 min	35.2	*39 MINUTES*
10:00 AM	5 hr 56 min	1 hr 29 min	5:25 PM	3 hr 46 min	44.5	***DISTANCE WALKED***
12:00 PM	6 hr 22 min	1 hr 35 min	7:57 PM	4 hr 12 min	47.7	*1.72 MILES*
2:00 PM	6 hr 40 min	1 hr 40 min	10:20 PM	4 hr 21 min	50	
4:00 PM	6 hr 26 min	1 hr 35 min	Midnight	4 hr 16 min	48.1	

NOTES: We see that the distance walked is lower here than any other plan that is presented within this paper. This comes as no surprise as the layout of the rides selected around the park allows for a somewhat circular loop that keeps wasted walking time and distance to a minimum. Notice the increasing amount of time to finish as time wears on. A very solid average of 35.2 minutes proves this to be an effective method of visitation for early risers.

"Hate Waiting": Indifferent to walking distances but hate waiting in line. Simulates visitors who "try" to choose the order of their day roughly based on popularity of rides.
Ride order (ride wait time, greatest to least): 0, 1, 2, 10, 7, 5, 3, 4, 6, 8, 9, 0

ARRIVAL	ALL RIDES COMPLETED	BREAKS	ACTUAL FINISH	LINE WAIT	TIME PER RIDE (AVG.)	***WALKING TIME***
8:00 AM	4 hr 35 min	1 hr 8 min	1:43 PM	2 hr 9 min	34.3	*55 MINUTES*
10:00 AM	6 hr 23 min	1 hr 35 min	5:58 PM	3 hr 57 min	47.8	***DISTANCE WALKED***
12:00 PM	6 hr 26 min	1 hr 36 min	8:02 PM	4 hr 0 min	48.2	*2.49 MILES*
2:00 PM	7 hr 8 min	1 hr 48 min	10:56 PM	4 hr 21 min	53.6	
4:00 PM	6 hr 23 min	1 hr 35 min	DNF (9/10)	4 hr 14 min	53.1	

NOTES: While this plan was put together in an attempt to reduce the amount of time spent standing in line, it appears that if you do not arrive at the park early on a day with a similar population density, you are out of luck. This plan is a good bet only for those who don't mind the extra bit of walking, and can get to the park at a decent hour. Arriving mid-day or later spells trouble, as seen in the last park entry time when the park simulation was unable to complete all ten rides prior to the park closing at midnight.

Random Ride Selection: Simulates visitors who have no plan of action, and complete all activities at their own discretion. Accounts for visitors that commonly think, "What should we do next?"
Random Ride order: 0, 1, 10, 7, 5, 6, 9, 4, 3, 2, 8, 0

ARRIVAL	ALL RIDES COMPLETED	BREAKS	ACTUAL FINISH	LINE WAIT	TIME PER RIDE (AVG.)	***WALKING TIME***
8:00 AM	4 hr 48 min	1 hr 12 min	2:00 PM	2 hr 19 min	36	*58 MINUTES*
10:00 AM	6 hr 10 min	1 hr 33 min	5:43 PM	3 hr 41 min	46.3	***DISTANCE WALKED***
12:00 PM	6 hr 38 min	1 hr 40 min	8:18 PM	4 hr 9 min	49.8	*2.66 MILES*
2:00 PM	7 hr 5 min	1 hr 46 min	10:51 PM	4 hr 26 min	53.1	
4:00 PM	6 hr 22 min	1 hr 40 min	DNF (9/10)	4 hr 11 min	53.3	

NOTES: Wandering around the park aimlessly looks to be no fun in any regard, aside from the continued early-bird pattern from the previous two plans. This plan has visitors taking the longest amount of breaks on average, and the amount of time spent waiting in line does not make me want to plan a late-June Disneyland vacation anytime soon.

"Do it again!": Accounts for visitors who enjoy attractions so much, that they want to repeat them. Only 8 different rides completed (10 total), 2 rides randomly chosen to be repeated again.
*Order (as given by map #'s): 0, 6, 6, 3, 4, 2, 1, 10, 9, 9, 8, 0 (No **SPLASH MOUNTAIN** OR **PETER PAN**)*

ARRIVAL	ALL RIDES COMPLETED	BREAKS	ACTUAL FINISH	LINE WAIT	TIME PER RIDE (AVG.)	***WALKING TIME***
8:00 AM	4 hr 23 min	1 hr 6 min	1:29 PM	2 hr 4 min	32.9	*43 MINUTES*
10:00 AM	5 hr 32 min	1 hr 23 min	4:55 PM	3 hr 12 min	41.5	***DISTANCE WALKED***
12:00 PM	5 hr 54 min	1 hr 28 min	7:22 PM	3 hr 35 min	44.2	*1.94 MILES*
2:00 PM	6 hr 4 min	1 hr 31 min	9:35 PM	3 hr 46 min	45.5	
4:00 PM	6 hr 7 min	1 hr 32 min	11:39 PM	3 hr 47 min	45.9	

NOTES: Probably the most interesting case study of Disneyland, as we get to look at a simulation that does not include two rides that are known to consistently have among the longer wait times in the park. This indicates that it most definitely matters which attractions you want to see and complete. If you formulate a plan that is based of rides that are quicker and less populated, you should expect to complete things faster. However, do know that this approach may not be as fulfilling as one that includes rides with longer wait times. After all, there is a reason that people are willing to wait so long to experience them.

7. Implications of Results

Arrival Time Matters

Some people are not early risers, and there is absolutely nothing wrong with that – unless you are visiting a theme park. In our model, the time to complete the selected rides is most definitely contingent on when you enter the park. It isn't too hard to figure that if you beat

the crowd to the park, you will certainly have less competition in almost every facet. This potentially allows visitors to be more productive and efficient in the same amount of time as their late-arriving counterparts.

Theme parks are expensive; make sure you study up beforehand!

The one day cost of admission at Disneyland for an adult is $96.00, while the same ticket at Universal Studios just down the road costs $92.00. Sea World isn't much cheaper with a going rate of $84.00. These tickets are obviously not cheap. Before arriving, try to have a good feel for what to expect from the theme park. See which rides people are most fond of, research which attractions are typically busiest, or should be avoided by those who are afraid of heights or do not want to get wet. The worst park experiences are had by those who get out of it what they put into it. Your time is valuable; make sure your leisure time is enjoyable!

Knowing what you don't want to do, is almost as important as what you DO want to do

Some people like the big, scary roller coasters, others prefer to rides that are of a different brand. The main attractions will tend to have longer wait times, if those are not your cup of tea, then make a plan that do not include them. Checking things off beforehand could save you precious time spent waiting in line, or wandering around to get to a ride you are unsure of, only to abandon it after seeing how high or fast it goes.

Effectively utilize available ride vouchers that reduce your wait in line (if offered)

While not discussed within this paper, some theme parks offer a feature that allows visitors to wait in line less, and enjoy more of the park and attractions. The Disney parks offer what is called a FastPass (**https://disneyland.disney.go.com/guest-services/fastpass/**), which allows users the ability to go to a ride that has a long wait, get a Fastpass that calls for you to come back to the same busy ride at a later time in the day. Upon return, you will enter a different ride line that allows you to skip well over half or even three quarters of the total wait time. Universal Studios offers a similar service (**https://www.universalorlando.com/Theme-Park-Tickets/Universal-Express/Express-Passes.aspx**), but is instead an add-on to your normal park entry ticket. Disney's FastPass feature is free of charge, which in unlike the ride voucher offered at Universal theme parks. These features vary by location for Six Flags theme parks. Be sure to check with your destination to see if a feature similar to this is offered. It could play a crucial role in your visit!

8. Limitations and Things to Consider for other Theme Parks

- **Operating hours:** Every theme park has different operating hours. This data is taken from a day that Disneyland is open 16 hours (8AM-Midnight). Other times of the year the park is only open 12 hours (9AM-9PM). While it may be fair to assume the crowds are not as big, one cannot say if the findings here would carry over for other

parks with different operating hours.

- **Weather:** Some rides may not open during raining days and the waiting time varies depends on weather. Also, the temperature and time of year will help determine how often you need to rest, apply sunscreen, or hydrate, among other things.
- **Personal Interest:** Some people are interested in watching shows and shopping instead of taking rides. Others like to spend all day in parks, while some may like to only be in the park for at most six hours. These personal preferences should be noted and discussed with your traveling party prior to visitation.
- **Health/height restrictions**: Those who have heart risk, are pregnant or have another medical condition may be unfit to ride one or more of the ride. Also, some rides require a minimum height requirement and shorter guests may not be able to visit the attractions featured in this project.

9. Question and Answer

Q1: *You presented an interesting idea, but why didn't you instead try to create a program or application that people can use to plan a day at a theme park themselves?*

A1: I initially wanted to create an app within SAGE that could read-in real-time ride waiting data and people could then choose where they wanted to go themselves. However, allowing people to create a schedule or plan without being very educated on the matter definitely seemed like a mistake. Instead a visual that showed people what to look for seemed like a more appropriate alternative and seems more likely to make a difference in improving ones park experience.

Q2: *Why did you feel that Disneyland was an appropriate theme park to model as one that could potentially be generalized to work in other theme parks?*

A2: Disneyland was a great place to look at because of how they have their park set up. They are constantly concerned with the enjoyment of their visitors and are willing to try anything and everything that could help them draw park goers. Some of the unusual measures that they take are not selling gum anywhere in the park, and making sure that a garbage can is no further than 30 feet from you at any time. In that regard, I see the Disney theme parks in general (not just Disneyland), as the theme parks that set the standard for visitors.

Q3: *How accurately do you think these theme park tips and tricks would be for say a Six Flags theme park or Universal Studios?*

A3: Honestly I am pretty confident in the results that have been found. If you arrive

early to a park, recognize which rides are most popular, utilize available line skipping measures, and minimize wasted time then I truly believe that your experience at any theme park will be heightened. Those who run in to trouble are the park goers who go to a theme park but do not know anything about it, and end up being hot, tired, and only completing five rides the entire day. Theme parks aren't cheap, so it is important to do your homework to make sure your investment is worth the experience.

Q4: If you were asked to take this project further, what would your next course of action include, or what would you want to accomplish in the end?

A4: As I progressed deeper into this project, it was very important to me to show people how complicated of a problem spending a day at a theme park actually is. In my eyes this project is just scratching the surface (if that).

If I had more time, I would ideally like to team up with a couple of other people (with programming skills) to create a user-friendly mobile app that tracks your park efficiency. I could see a partnership with parks where they agree to provide real-time ride wait times, until the number of users is self-supporting-- meaning at least until enough people use the app where the ride times are reported by the people in the parks themselves. In that manner, the app itself wouldn't have to do much work at all, but would be a very powerful commodity for users.

In a best case scenario, I could see app users having the ability to choose from a number of theme parks (Disney, Universal Studios, Six Flags), and there being a catalog of different theme park approaches for each. Each plan would have a user rating or enjoyment level and would be easy on the eyes for people who are inexperienced in visiting theme parks.

10. Acknowledgements

I would like to thank Len Testa of touringplans.com for providing me with the ride data for June 21st, 2013, which allowed me to complete a project on a topic that truly piques my interest. Without the data or insight he provided me with on the nuances of experiencing a day at a theme park, this paper would not have materialized.