DESIGN RESEARCH SEMINAR

MOBILITY FOR FUN

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MOBILITY AND VEHICLE DESIGN

GUIDED BY: Dr. SUGANDH MALHOTRA

IDC SCHOOL OF DESIGN

INDIAN INSTITUTE OF TECHNOLOGY

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DECLARATION

I declare that this written submission represents my ideas in my own words and where other's ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

SIGNATURE 

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DATE: 20th July 2017

APPROVAL SHEET

This Vehicle Design Research Seminar Entitled ‘MOBILITY FOR FUN‘by
Umesh Dinde,156390006, is approved in the Partial Fulfilment of the Requirements for Master in Design Degree in Mobility and Vehicle Design.

Project Guide:

(PROF. SUGANDH MALHOTRA).

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Introduction

About Project

This project is mainly focuses on the fun and recreational vehicles. These vehicles are may be or may not be daily commuter yet they such vehicles invoke feeling of joyfulness, enjoyment and excitement while riding. ‘Mobility for Fun’ projects major aim to identify what makes any vehicle to raise such feelings and articulate them into more meaningful manner.

This project will help to know how excitement, enjoyment etc. fun felling appealed through a vehicle.

Relevance or need of the project

Mobility is broadly understood as a medium of commuting from point A to Point B. This commuting process need not to be dull, boring or grey in nature. When fun element attached to any object it become as a game. Being human we love to play and enjoy, it is sort of recreational activity and mental boost to humans.

This project is exactly probing into that area and tries to identify and explain what are those factors in mobility which create enjoyable experience. Going one step ahead this project also attempt to identify what are the aspects make mobility more enjoyable.

02
Literature study

Literature study

Literature study includes current knowledge including substantive findings, as theoretical and methodological contribution to automotive industry. ‘Mobility for fun’ project refers data of various vehicles which create enjoyable experience. Following kinds of vehicles are includes in study.

1. Fun Vehicle- Fun vehicle are those vehicles which gives enjoyment and pleasure. Fun vehicle gives experience short term, often unexpected, informal generally purposeless. These vehicles divert the mind and body from any serious task.
2. Recreational vehicle- Recreational Vehicle is a vehicle gives leisure, leisure being unrestricted by time. These vehicles also considered

as fun vehicle

3. Entertaining vehicle- These vehicles perform unique activity which is fun to watch and perform.

SEGWAY

Figure 1: Segway

The Segway is a two-wheeled, self-balancing, battery-powered electric vehicle. Computers, sensors, and electric motors in the base of the Segway PT keep the device upright when powered on with balancing enabled. The Segway uses gyroscopic sensors and accelerometer-based levelling sensors to detect the resulting changes in its pitch angle and, to maintain balance, it drives its wheels forward or backward as needed to return its pitch to upright. The Segway responds by adjusting the speeds of the wheels in opposite directions causing the PT to yaw and, if not traveling forward or backward, turn in place. At speed, the amount of shift of the handlebar corresponds to the amount of left or right lean required by the rider to balance themselves on the platform during a turn. The maximum speed of the Segway PT is 12.5 miles per hour (20.1 km/h). The product is capable of covering 24 mi (39 km) on a fully charged lithium-ion battery, depending on terrain, riding style, and the condition of the batteries. [1]

SEGWAY HOVERBOARD

A self-balancing scooter or self-balancing two-wheeled board, commonly referred to as a "hoverboard", is a type of portable, rechargeable battery-powered scooter. They typically consist of two wheels arranged side-by-side, with two small platforms between the wheels, on which the rider stands. The device is controlled by the rider's feet, standing on the built-in gyroscopic, sensored pads. A hoverboard with a range of 11 to 15 miles per hour is your best bet if you want a device that is fast but not too fast.[2]

Figure 2:Segway hoverboard

Figure 3: Solo Wheel

SOLOWHEEL

The Solo Wheel Scorpion is the newest addition to Inventist’s personal transportation line! The Scorpion features a new case design, including a convertible carrying/walking handle that also doubles as a “kickstand”. Unfold the handle to walk while pushing the wheel. It’s perfect for when you enter an area where you can’t ride, or if your battery is drained. Walking continuously with the wheel on level ground will charge the battery, even

with the power off! Leave the handle folded down to carry the Scorpion or to use the kickstand feature. The new design also includes a headlight to illuminate the road ahead of you, and Bluetooth for connecting to our Solo wheel app. [3]

LIT C-1

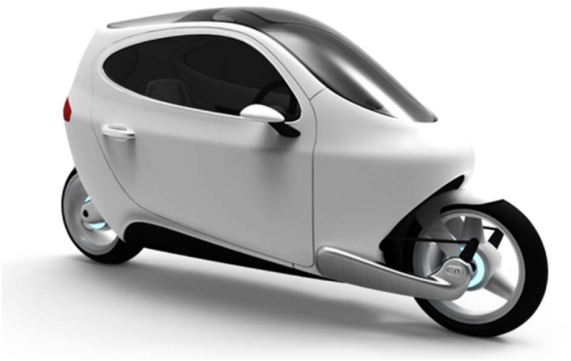


Figure 4: LIT C1

Lit Motors Inc. is a San Francisco-based company that designs two-wheeled vehicles, including a fully electric, gyroscopically stabilized vehicle. Lit Motors designs two-wheeled vehicles with a focus on innovative and disruptive technologies. To date, they have released information about two projects: the AEV (auto-balancing electric vehicle) often referred to as the "C-1" and the Kubo cargo scooter. The inspiration for Lit Motors came to Kim in 2003, when he was nearly crushed by a chassis while manually assembling a bio-diesel Land Rover Defender 90. Kim decided to "chop a car in half" to create what is now the C-1. The design vision showcased an enclosed two-wheeled vehicle self-balanced by two single-gimbal control moment

gyroscopes, [4] to be powered by lithium iron phosphate batteries. Design specifications indicated that it could hold a second passenger. [4]

Figure 5: RYNO Electric Uni wheel

RYNO ELECTRIC UNI WHEEL

It takes a special kind of magic to make an electric one-wheeled motorcycle not terrifying to ride, and ryno motors has pulled it off. The micro cycle, which has a single 25-inch motorcycle tire and reaches speeds up to 10 mph, uses a combination of gyroscope sensors and accelerometers to balance itself. That, combined with a strategic weight distribution and an intuitive acceleration and braking method, makes this motorized unicycle from the future actually feel … safe. [5]

Figure 6: HONDA U-3X

HONDA U-3X

The Honda U3-X is a self-balancing one-wheeled electric vehicle designed for personal transport. Honda developed the U3-X with technology originally developed for ASIMO the bipedal human robot project. Honda states that the "U" stands for unicycle and for universal. [1] It weighs 10 kg (22 lb) and travels at 6 km/h (3.7 mph) Honda U3-X is a compact experimental device that fits comfortably between the rider's legs, to provide free movement in all directions just as in human walking - forward, backward, side-to-side, and diagonally. It uses Honda Omni-Traction (HOT) drive system to permit it to move in any lateral direction. The system uses multiple small diameter motorised wheels connected inline to form one large diameter wheel. Rotating the large diameter wheel moves the U3-X forward and backward, while rotating the small diameter wheels moves it side-to-side. Combining these movements causes the U3-X to move diagonally. [6]

Figure 7: JYRO

JYRO

Jyro has unveiled a line of self-balancing, single-wheeled devices that can drive up to 15 miles per hour. The Jyro devices are equipped with a gyroscope accelerometer. The Jyro Roll is their electronic stabilized, self-balancing, single-wheeled skateboard that can hit a max speed of 12mph.[7]

MONOWHEEL

Figure 8: Monowheel

A monowheel is a one-wheeled single-track vehicle similar to a unicycle. However, instead of sitting above the wheel, the rider sits either within it or next to it. The wheel is a ring, usually driven by smaller wheels pressing against its inner rim. Most are single-passenger vehicles, though multi-passenger models have been built. [8]

Figure 9: Spherical Drive

SPHERICAL DRIVE

In an age where mass media and celebrity culture often influence consumers to be more expressive of their tastes, individuals are looking to more eccentric products as a unique source of expression. Automobiles that feature egg shapes and pod-like features provide a visually flamboyant source of transportation, combining practical everyday activities with the need for more outlandish forms of visual communication. [9]

LEXUS SLIDE

Figure 10: Lexus Slide

Slide it is a skateboard-like device that floats a few inches above the ground, promising the ultimate in futuristic, personal travel. the slide contains a series of magnets and superconductors cooled by liquid nitrogen. The board has 32 Yttrium-Barium-Copper Oxide superconductors cooled by liquid nitrogen and rides on a magnetic track. The SLIDE maintains a hover height of about 1 to 2 inches above ground and can support about 440 pounds in weight. [10][11]

Figure 11: Hendo Hoverboard

HENDO HOVERBOARD

The Hendo Hover is powered via four downward-facing electromagnets. These engines create a magnetic field which essentially pushes against itself to levitate. There is, however, a pretty big caveat. The Hendo Hover can only function (hover) when situated above a non-ferromagnetic conductor surface or in layman's terms a metal sheet that doesn't contain iron or steel. [12]

AIR BIKE AERO-X

Aero-X, a vehicle that makes low-altitude flight realistic and affordable. Flying up to 10 feet off the ground at 45 miles per hour, the Aero-X is unlike any vehicle you've seen. It's a surface-effect craft that rides like a motorcycle - an off-road vehicle that gets you off the ground.

Figure 12: AIR BIKE AERO-X

The Aero-X can be adapted for unlimited outdoor uses: surveying, search and rescue, border patrol, disaster relief, aerial agricultural, ranching, and much more. [13]

Figure 13:WALKING BALL

WALKING BALL

Zorbing (globe-riding, sphering, orbing) is the recreation or sport of rolling downhill inside an orb, generally made of transparent plastic. Zorbing is generally performed on a gentle slope, but can also be done on a level surface, permitting more rider control. In the absence of hills some operators have constructed inflatable, wooden, or metal ramps. Due to the buoyant nature of the orbs, Zorbing can also be carried out on water, provided the orb is inflated properly and sealed once the rider is inside. There are two types of orbs, harnessed and non-harnessed. Non-harness orbs carry up to three riders, while the harness orbs are constructed for one to two riders. [14]

WALK CAR

Figure 14: Walk car

Cocoa motors developed a portable transporter small enough to be carried in a backpack. The lithium battery-powered "Walk Car" transporter, which is the size of a laptop and resembles a skateboard more than a car. The slender Walk Car is made from aluminium and weighs between two and three kilograms (4.4 to 6.6 pounds), depending on whether it is an indoor or outdoor version. It reaches top speeds of 10 kilometres per hour (6.2 miles per hour), for distances of up to 12 kilometres (7.4 miles) after three hours of charging. [15]

SKATE BOARD

Figure 15: Skate board

A skateboard is a type of sports equipment used primarily for the activity of skateboarding. It usually consists of a specially designed Maplewood board combined with a polyurethane coating used for making smoother slides and stronger durability. Most skateboards are made with 7 plies of this wood. A skateboard is moved by pushing with one foot while the other remains on the

board, or by pumping one's legs in structures such as a bowl or half pipe. A skateboard can also be used by simply standing on the deck while on a downward slope and allowing gravity to propel the board and rider. [16]

Figure 16: Roller blades

ROLLER BLADES

Inline skates are a type of roller skate used for inline skating. Unlike quad skates, which have two front and two rear wheels, inline skates typically have two to five wheels arranged in a single line. Some, especially those for recreation, have a rubber "stop" or "brake" block attached to rear of the frame. The modern style of inline skates was developed as a substitute for ice skates, for use by a Russian athlete training on solid ground for Olympic long track speed skating events. [17]

CHARIOT SKATES

Figure 17: Chariot skates

Only the unique large wheel and pneumatic tyre of Wheel-skates allow you to: gain and maintain momentum with less effort, greater stability and more manoeuvrability skate over rougher terrain or ski down grassy slopes or commute like a bicycle free of seat & handle bars. The mechanism helps create the impression of skiing and skating when moving forward. The low centre of gravity in his skates allows users greater speed and manoeuvrability than traditional inline skates, adding that he travels around 12 mph without traffic. The prototype skates are made of expensive carbon composite material, and estimated production costs are comparable to those of "first-class carbon fibre bicycles," according to Chariot Skates, which is based in Hong Kong. [18]

ORBIT WHEEL SKATE

Figure 18: Orbit wheel skate

If roller skates are too retro and skateboarding too restrictive, there's a new hybrid vehicle to master. The Post-Modern Skateboard is a cross between a skateboard and inline skates, and allows riders to perform effortless-looking spins... with a lot of practice. It comprises two 10-inch wheels, which riders position their feet inside, instead of balancing on a conventional board. The wheels can be joined together with a pole, to make the experience more like skateboarding, or kept separate, to be used more like in-line skates. The annular skates are propelled by leaning side to side, allowing you to skateboard without having to push off the ground. Riders simply place their feet on the two platforms and lean side-to-side to rotate the rubber wheels around the feet, propelling riders forward in a serpentine motion similar to longboard skateboarding. [19]

Figure 19: Roller skates

ROLLERSKATES

Roller skates are shoes, or bindings that fit onto shoes, that are worn to enable the wearer to roll along on wheels. The first roller skate was effectively an ice skate with wheels replacing the blade. Later the "quad" style of roller skate became more popular consisting of four wheels arranged in the same configuration as a typical car. Roller skating is the traveling on surfaces with roller skates. It is a form of recreational activity as well as a sport, and can also be a form of transportation. Skates generally come in three basic varieties: quad roller skates, inline skates or blades and tri-skates, though some have experimented with a single-wheeled "quintessence skate" or other variations on the basic skate design. [20]

Figure 20: Rocket skates

ROCKET SKATES

Rocket Skates are here to put wheels on your shoes. It's up to you to decide if that's necessary. The R5's can be fully controlled with a controller. World's first smart electric skates. Can reach up to 12MPH with a range of 10 miles on a full charge. Download the mobile app and connect with the Rocket Skates community. Battery charging time 2 hours. Fits men's shoe sizes 6 1/2+ and women's 6+. Ages 16 and up. [21] [22]

Figure 21: Bionic boots

BIONIC BOOTS

The 'Kangoo Jumps' are fastened like roller blades or ski boots, with quick-release buckles. Once they're on, you need to do a little march on the spot to get yourself used to the sensation, which feels rather like jogging on a trampoline. Featuring a spring-loaded sole, the mini-trampolines were initially invented to help people recover from sports injuries by taking away the impact of running on their joints. But now they're being sold as a way

of enjoying all the benefits of a tough gym or aerobics workout. Bionic boots let you run as fast as a CAR: Springy shoes mimic ostrich's gait to let you travel at up to 25 miles per hour. [23]

MONDO SPIDER

Figure 22: Mondo spider

This ridable mechanical walking machine was designed by a team of artists and engineers as an industrial metal beast destined to rock Burning man and the world of kinetic sculpture. Inspired by Vancouver Junkyard Wars, this giant hydraulic monster was hewn from steel with passion and precision. Call it robot... call it biomimicry... call it what you will... We call it... The MONDO SPIDER. [24]

Figure 23: Bionic runner

BIONIC RUNNER

When's a bike not a bike? When it's a running machine called the Bionic Runner. This invention allows runners to train on through injury recovery without the risk of further damage. The Bionic Runner, currently on Kickstarter, was created as a way to allow runners to keep training even after injuries. It does this by removing the impact from running but while continuing to work the same muscles. This is done by finding that natural 60 per cent swing and 40 per cent stance phase timing that's indicative of running. So, essentially, the bike mimics running as you move. [25]

Figure 24: Sideways bike

SIDEWAYS BIKE

inspired by the way that snowboarding is preferred to skiing due to the greater artistic potential, and decided to design a snowboard equivalent for the conventional bicycle. The result: a bike ridden sideways with the rider operating both wheels. The bike, unlike a conventional bike, uses front-to-

back balance like a snowboard. Conventional bikes use left-to-right balance, like skis. [26]

LUNARTIC BIKE

Graeme Obree likely needs no introduction among cyclists who've been involved in the sport for any length of time. The Scotsman is famous for his world hour records and the unorthodox "superman" position he used on his custom-built track bike, Old Faithful. Nearly two decades after beating the UCI hour record, Obree is chasing a new world record, the human powered vehicle land speed record. Given that the only rule for the HPV record is that the vehicle must not have an engine, Obree is free to play to his creative strengths and build any wild bike he can dream up. [27]

RECUMBENT BICYCLE

Figure 25: Recumbent bicycle

A recumbent bicycle is a bicycle that places the rider in a laid-back reclining position. Most recumbent riders choose this type of design for ergonomic reasons; the rider's weight is distributed comfortably over a larger area, supported by back and buttocks. On a traditional upright bicycle, the body weight rests entirely on a small portion of the sitting bones, the feet, and the hands. Most recumbent models also have an aerodynamic advantage; the reclined, legs-forward position of the rider's body presents a smaller frontal profile. A recumbent holds the world speed record for a bicycle, and they were banned from racing under the Union Cyclist Internationale (UCI) in 1934, and now race under the banner of the Human Powered Vehicle Association (HPVA). [28]

Figure 26: Twicycle

TWICYCLE

the Twicycle “was invented out of a desire to achieve a full body workout while cycling outdoors and out of frustration that no such affordable product exists on the market today. While you could just cycle with your legs (yes, the Twicycle doesn’t actually force you to use your upper body), you can also cycle with only your arms. Take your pick. [29]

Figure 27: Street flyer

STREET FLYER

THE STREET FLYER is a hang-glider for the streets. It’s like an oversized tricycle, but instead of sitting on top to pilot it, you hang beneath. To propel the vehicle, you run and then just drop into the harness and cruise. steered with a pair of handgrips connected to the two front wheels, but other designs could let you steer by moving your body in the cradle, hang-glider-style. [30]

TREADMILL BICYCLE

Figure 28: Treadmill bicycle

bike enthusiast Bergmeester came up with the idea while training in the gym, pondering: 'How can I use the treadmill outdoors? What about a treadmill on wheels?' As the rider walks, sensors register the turning treadmill and kick the motor into gear to assist the movement and set the wheels in motion. According to its makers, the bikes can travel 30 to 50 miles on a charge and a selection of gears enable the user to change the walking pace from a leisurely stroll to a brisk walk. Depending on terrain, gear selected and how energetic the user is feeling, it can achieve speeds between 4–17 mph (6–27 kph). [31]

UNBELIEVABLE AeYO

Figure 29:UNBELIEVABLE AeYO

The bizarre vehicle, dubbed the AeYO, claims to combine the efficient and dynamic motion of inline skating with the convenience and safety of a bicycle. It features the handle bar, brakes levers and basket of a bicycle but has a pair of skates attached to the steering column. Compatible with any

regular shoe size, the rider straps their feet in and then uses a skating motion to propel the vehicle forwards. While on a traditional scooter, riders are likely to plant their one leg for the majority of the time, but the Aeyo's design keeps both legs moving. The legs allow the skates to move freely, but also prevent them from tilting, keeping the feet stable. [32]

Figure 30: Half bike

HALFBIKE

The Half bike is ridden standing up, similar to a Segway. The 2.1 version has a three-gear hub, which has been designed to make the vehicle "easier to ride and more user-friendly" than the previous single-speed version. Designed to create a feeling closer to walking than the traditional pedalling movement, the scooter-bicycle hybrid is steered by the rider's bodyweight and a waist-high handlebar. [33]

FAMILY CYCLE

Figure 31: Family cycle

The tandem bicycle or twin is a form of bicycle (occasionally a tricycle) designed to be ridden by more than one person. The term tandem refers to the seating arrangement (fore to aft, not side by side), not the number of riders. A bike with two riders side by side is called a sociable. Tandems are subjected to unique stresses caused by additional riders and weight requiring solutions specific to tandem construction. The phrase "Tandem Specific" was popularized by its use in Santana tandem catalogues during the 1990s. [34]

Figure 32: Yamaha MWT-9

YAMAHA MWT-9

The MWT-9 is nowhere near Yamaha's first venture into the three-wheeler territory but is definitely a bold step up from the 125cc Tricity scooters. It's still unclear who makes the customer pool for Yamaha's new creation, but we'd go with riders that are having troubles making the most of a classic two-wheeled motorcycle because of age or injuries. [35]

DODGE TAMAHAWK

Figure 33: Dodge tamahawk

The Dodge Tomahawk was a non–street legal concept vehicle introduced by Dodge at the 2003 North American International Auto Show. The Tomahawk attracted significant press and industry attention for its striking design, its use of a large-capacity 10-cylinder automobile engine, and its four close-coupled wheels, which gave a motorcycle-like appearance, and fuelled debate on whether it was or was not actually a motorcycle. The Retro-Art Deco design's central visual element is the 500-

horsepower (370 kW), 8.3-litre (510 cu in) V10 SRT10 engine from the Dodge Viper. The vehicle has two front wheels and two rear wheels, which are sprung independently and theoretically allow it to lean into corners and counter steer like a motorcycle. [36]

Figure 34: Go kart

GO KART

A go-kart, also written as go-cart (often referred to as simply a kart), is type of open-wheel car. Go-karts come in all shapes and forms, from motor less models to high-powered racing machines, some, like Super karts, being able to beat racing cars or motorcycles on long circuits. [37]

SWINCAR SPIDER

Figure 35:swincar spider

a car that can tackle any terrain with the agility of a spider could give them a run for their money. The Swincar can navigate steep slopes and ditches just as easily as a tarmac road and its wheels are each on separate 'arms' that can move independently. It can also be driven up and down steep banks with little discomfort to the driver. The Swincar's extraordinary agility is made possible by each wheel having independent motors and suspension. This unusual set-up means that the body of the car remains vertical even when the car is performing incredible feats on steep slopes. Each wheel is attached to an arm that has a high degree of manoeuvrability, including seemingly folding under and over the driver. [38]

Figure 36: Screw drive vehicle

SCREW DRIVE VEHICLE

A screw-propelled vehicle is a land or amphibious vehicle designed to cope with difficult snow and ice or mud and swamp. Such vehicles are distinguished by being moved by the rotation of one or more auger-like cylinders fitted with a helical flange that engages with the medium through or over which the vehicle is moving. Modern vehicles called Amphirols and other similar vehicles have specialised uses. [39]

Figure 37: ATV

ATV

An all-terrain vehicle (ATV), also known as a quad, quad bike, three-wheeler, four-wheeler, or quadricycle as defined by the American National Standards Institute (ANSI) is a vehicle that travels on low-pressure tires, with a seat that is straddled by the operator, along with handlebars for steering control. As the name implies, it is designed to handle a wider variety of terrain than most other vehicles. The rider sits on and operates these

vehicles like a motorcycle, but the extra wheels give more stability at slower speeds [40]

CADILLAC POOL

Figure 38: Cadilac pool

A couple of car enthusiasts from Los Angeles have come up with an ingenious way to car pool by converting a classic car into a hot tub. When its swimming tank has been filled up, the car carries about 5,000lb of water. The former engineering students also fitted it with a marine throttle so the engine will keep running. [41]

LAND YACHT

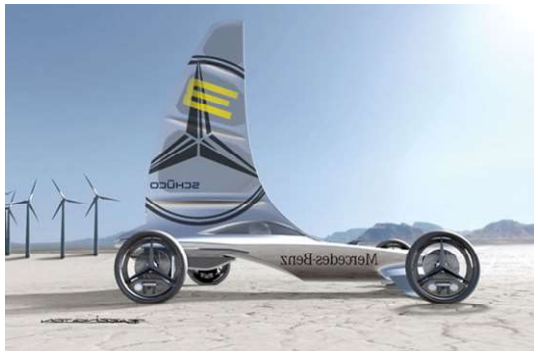


Figure 39: land Yacht

Land sailing, also known as 'sand yachting' or 'land yachting', is the act of moving across land in a wheeled vehicle powered by wind through the use of a sail. They typically have three (sometimes four) wheels and function much like a sailboat, except that they are operated from a sitting or lying position and steered by pedals or hand levers. Land sailing works best in windy flat areas, and races often happen on beaches, airfields, and dry lake beds in desert regions. Modern land sailors, generally known as "pilots", can go three to four times faster than the wind speed. [42]

monster truck

Figure 40: Monstor truck

A monster truck is a pickup truck modified with a larger suspension and larger tires. Today pickup trucks are still used. A competition monster truck should meet the guidelines of being 12 feet tall, 12 feet wide and be equipped with 66-inch off-road tires and from 2015 to present the are out fitted with BKT TIRES which were made specifically for the trucks, the

weight of each tire is 462LB. Monster trucks used to be side acts at popular motocross events and mud bogs but today they are usually the main attraction with motocross and mud bogging being the complimentary shows. [43]

03
Objective

Objective of this study/research

1. To identify and critically look at ‘fun’ in off-beat and interesting vehicle
2. To cluster those vehicles to sub categories based on identical fun experience parameters.
3. To Identify top most exciting and fun experience vehicles from the pool of all fun vehicles.

04
Methodology

Methodology of research

- Identification of fun vehicle
- Classification of those vehicles
- Review the ‘fun’ quotation in the vehicle
- Identifying the most interesting vehicle using review method
- Identifying the what make them interesting

Experiment 1-

- source of data comes from listing articles which states that ‘most crazy cars’, ‘top 10 weird vehicle’, ‘crazy amazing vehicle’, ’10 most amazing vehicle’, ‘most bizarre vehicles ever made’, ‘5 crazy electric vehicles you can buy online’ etc.

- detailed data gathered from specification online sites and critical review of the vehicle. For some vehicle reviews were not available for those products related news were gathered.
- Data sorting is done through data mining software KH coder to search most frequent terms used in the literature.
- Content analysis is done using KH coder only. For which co-occurrence test, hierarchy test, multi-dimensional data analysis was done to identify the parameters and broad categories of the fun vehicle.

Details of the software

- Name of the software: KH Coder
- Setup Filename: khcoder-200f-f.exe
- Stable Version: 2.00f
- Company: Sourceforge
- Webpage: https://sourceforge.net/projects/khc/
- Powered by: ChaSen, MySQL, Perl, R and more

- Thanks to: KAWABATA, Akira
-
- Basic function: Quantitative Content Analysis
- Availability: Freeware

About KH Coder:

KH Coder is a free software for quantitative content analysis or text data mining. It is also utilized for computational linguistics. You can analyse Japanese, English, French, German, Italian, Portuguese and Spanish text with KH Coder. Also, Catalan, Chinese (simplified), Korean, Russian and Slovenian language data can be analysed with the latest alpha release (Version 3).

KH Coder provides various kinds of search and statistical analysis functions using back-end tools such as Stanford POS Tagger, FreeLing, Snowball stemmer, MySQL and R. Functions can be done with this are -

Words: Frequency List, Searching, KWIC Concordance, Collocation Stats, Correspondence Analysis, Multi-Dimensional Scaling, Co-Occurrence Network, Hierarchical Cluster Analysis Categories: Developing Your Own Categories or Dictionaries, Frequency List, Cross Tabulation, Correspondence Analysis, Multi-Dimensional Scaling, Co-Occurrence Network, Hierarchical Cluster Analysis Documents: Searching, Clustering, Naive Bayes classifier

Experiment 2-

- Data collection is done by taking reviews from educated user group with technological background. Reviewer were asked to give rating on the images of vehicle on the scale of 1 to 10. 1 means not at all fun vehicle and 10 means most exciting and fun vehicle.
- Data recording and data sorting is done by using Microsoft Excel software. Data sorting records user comments and their scores.
- Data analysis is also done through Microsoft excel software to conclude top 10 vehicles

05
Results

Result of Experiment 1

The processes are followed for analysis are:

1. Frequency of Words - This process gives a generic list of most frequently used words on those selected websites fun vehicles. From this we can get an idea about the parameters based on which fun experience is determined

2. Hierarchy cluster- This data gives basic idea of how word association is happening within the data

3. Co-Occurrence Network of Words - This process gives the word association of maximum frequent words in their classified sector. From this visual information, different parameters and elements of fun. Size of bubbles and bold connection lines gives an idea of most used words.

4. Multi-Dimensional of Words - This process gives word association with clusters. Each cluster has different colour to denote and size of bubbles gives an idea of most

used words. Furthermore, if we apply filters like noun-adjective or verb-adverbs, detail information can be found in a more logical way. So now we will do further analysis filtered visuals to get more in-depth knowledge.

Noun		Proper Noun		Foreign		TAG		Adj		Adv		Verb	
wheel	74	Segway	30	uk	123	span_class="s1"	1	electric	35	just	40	say	73
car	46	LEXUS	29	hi	1			real	13	actually	17	use	67
bike	41	RYNO	25	n.d.	1			small	13	forward	14	ride	57
people	36	HONDA	18	pi	1			similar	12	far	11	make	50
vehicle	36	BIONIC	17					mechanical	11	simply	11	work	38
foot	34	SPIDER	16					single	11	fully	9	retrieve	32
skate	34	MONDO	15					amazing	10	apparently	8	march	30
speed	34	Prosthesis	12					better	10	instead	8	think	30
hoverboard	31	Runner	12					inline	10	right	8	build	28
scooter	30	SWINCAR	9					easy	9	basically	7	run	26
technology	30	eatART	8					free	9	long	7	allow	22
firm	29	HALFBIKE	8					hot	9	soon	7	come	22
board	27	Japan	8					little	9	downhill	6	look	22
machine	27	Jyro	8					able	8	maybe	6	help	21
rider	27	Motors	8					different	8	probably	6	skate	21
design	25	SLIDE	8					impossible	8	quickly	6	create	20
way	24	WalkCar	8					perfect	8	constantly	5	try	19
device	23	Tokyo	7					best	7	currently	5	walk	18
video	23	Twicycle	7					human	7	quite	5	claim	17
company	20	Arx	6					liquid	7	really	5	lean	17
charge	19	CHARIOT	6					local	7	absolutely	4	start	17
hour	19	FLYER	6					lower	7	automatically	4	design	16
version	19	HENDO	6					magnetic	7	backwards	4	travel	15
skateboard	18	HOVERBOARD	6					old	7	easily	4	accord	14
bicycle	17	Mr	6					personal	7	finally	4	drive	14
mile	17	Pax	6					upright	7	forwards	4	mean	14
motor	17	Shaw	6					available	6	obviously	4	reach	14
world	17	Skates	6					bizarre	6	originally	4	reveal	14

body	16	STREET	6					cool	6	specifically	4	set	14
project	16	Tippett	6					independent	6	away	3	need	13
unicycle	15	KickStarter	5					natural	6	backward	3	push	13

Figure 41: Frequency of Words

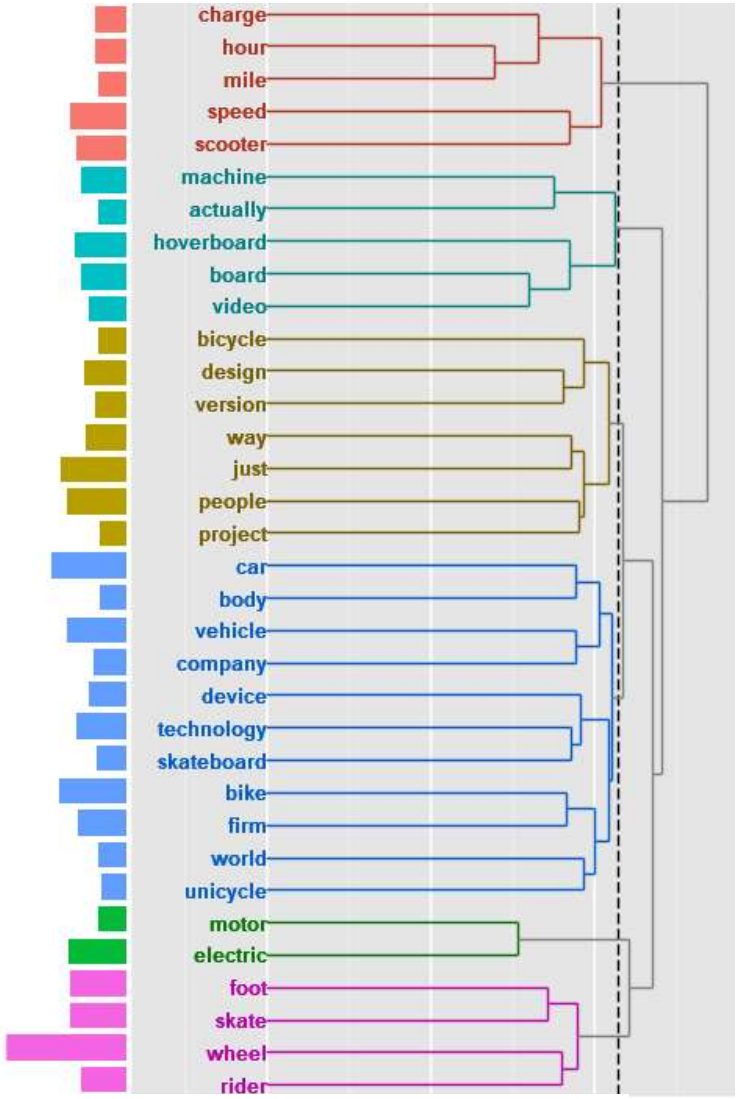


Figure 42:Hierarchy cluster

From Hierarchy analysis following attributes of fun determined. Those attributes are shown in co relative clusters are as follow

Cluster 1: Bicycle – design, version, way, just, project

Cluster 2: Skateboard- technology device, vehicle

Cluster 3: Electric- motor

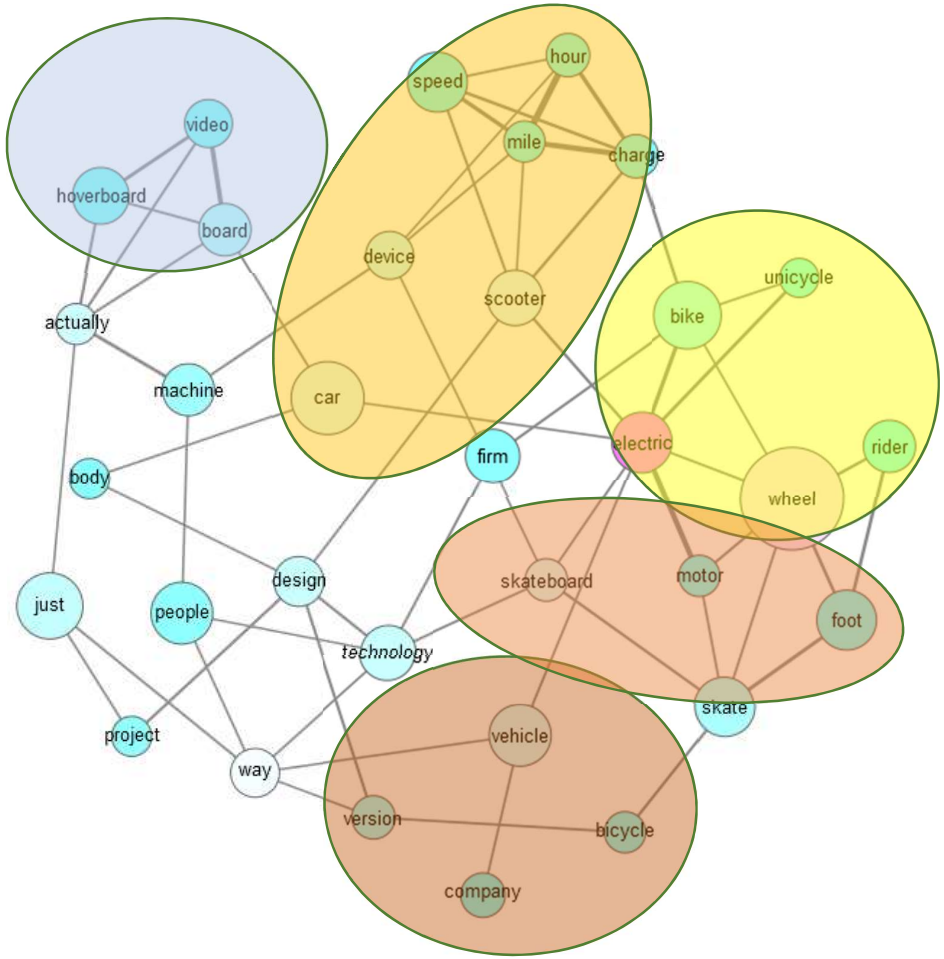


Figure 43: co-occurrence analysis

Clusters formation using words

Cluster 1: Hover- Hoverboard, board

Cluster 2: Speed- mile/hour, car, device

Cluster 3: Electric- Bike, uni-cycle, wheel, rider

Cluster 4: Skate- foot, skateboard, motor

Cluster 5: bicycle- bicycle, vehicle

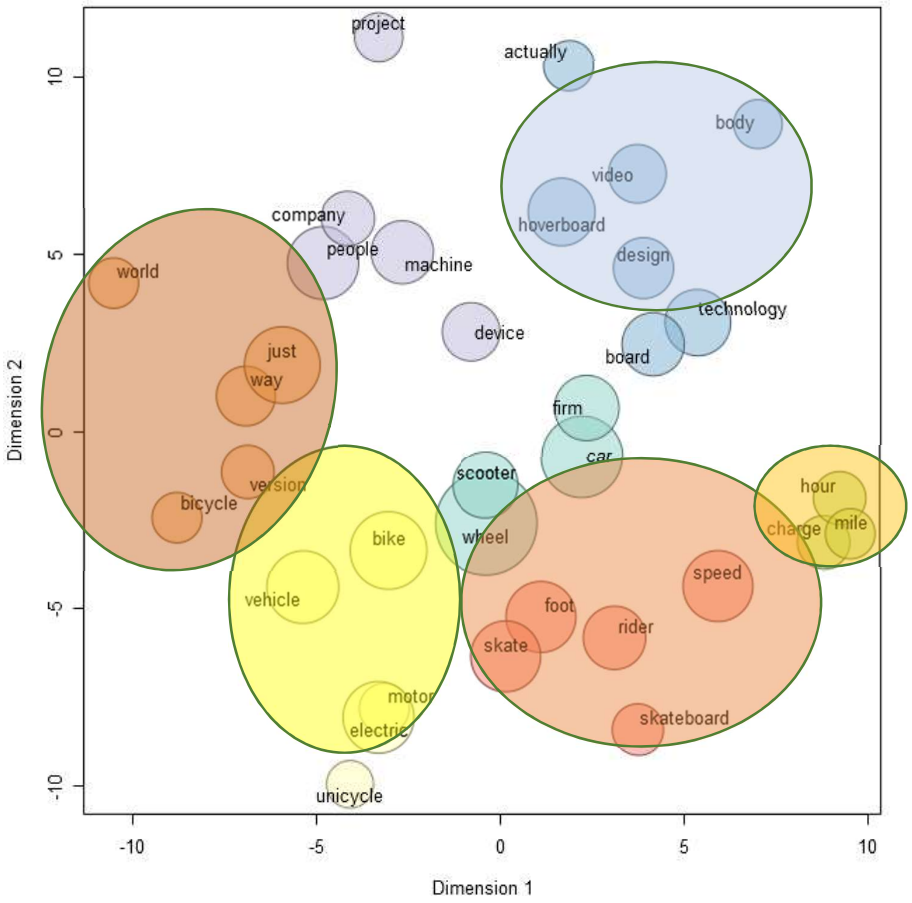
Meaning of clusters

Cluster 1: represents hovering experience on board or on vehicle

Cluster2: represent car like vehicle, who concerns with speed and devices

Cluster 3: Electric bike with single wheel or multiple wheels are characterized. Rider experience is a major focus here

Cluster 4: signifies skateboarding experience as well as electric motor involvement in the skateboarding



Cluster 5: represents different ways or versions of bicycle.

Clusters formation using words

Cluster 1: Hover- Hoverboard, board, body

Cluster 2: Speed- mile/hour, car, device, charge

Cluster 3: Electric- Bike, uni-cycle, wheel, rider

Cluster 4: Skate- foot, skateboard, motor

Cluster 5: bicycle- bicycle, vehicle, way

Meaning of clusters

Cluster 1: represents hovering experience on board or on vehicle

Cluster2: represent car like vehicle, who concerns with speed and devices

Cluster 3: Electric bike with single wheel or multiple wheels are characterized. Rider experience is a major focus here

Figure 44: multi-dimensional scaling

Cluster 4: signifies skateboarding experience as well as electric motor involvement in the skateboarding

Cluster 5: represents different ways or versions of bicycle.

Result of Experiment 2

SR no.	Vehicle	Score Lavendra	Ashish	Rishabh	Nishant	Umesh	Tarun	Udbhav	
14	Bionic Boots	6	9	9	8.8	9	8	9	8.4
7	Lexus Slide	7	8	8.5	7.7	8.5	9	9	8.242857
38	ATV	8	8	7	8.3	7	9	9	8.042857
34	Swingcar Spider	8	8	5	8	8.5	9	8	7.785714
17	Hover Boards	9	8	8.5	7	7.5	7	7	7.714286
32	Dodge TOM hawk	6	8	9.5	7.9	7	8	7	7.628571
11	Roller blades	9	8	7.5	6.7	8	7	7	7.6
40	Air Bike AERO-X	5	9	8.5	8.2	6.5	9	7	7.6
22	Lunartic Bike	8	8	9.5	6	6.5	7	8	7.571429
35	Monster Trucks	6	8	8	8	8	7	8	7.571429
18	Rocket skates	7	7	7	7.5	8	8	8	7.5
30	Yamaha MWT-9	5	8	9	7.4	8	8	7	7.485714
27	AeYO	8	8	7	7.7	7.5	7	7	7.457143
5	Ryno One wheel electric scooter	6	8	8	7.5	5.5	9	8	7.428571
2	Segway Hoverboard	8	7	7	6.5	7	6	9	7.214286
16	Roller skates	7	8	7	6.8	7.5	6.5	7	7.114286
10	Skate board	7	9	6	6.2	7.5	7	7	7.1
42	Land yacht	6	6	8.5	7.2	8	7	7	7.1
19	Mono wheel	6	5	8	6.9	8.5	8	7	7.057143
29	Family Cycle	9	5	6.5	7.9	6.5	7	6	6.842857
12	Chariot skates	8	7	4.5	7.1	7.5	7	6	6.728571
33	GO Kart	7	4	7	7.6	7.5	8	6	6.728571
43	Spider Walking Machine	7	5	4.5	7.3	8	9	6	6.685714
37	Spherical Drive	6	7	5	6.7	8	8	6	6.671429
13	Double round skate	7	6	6.5	7.3	6.5	7	6	6.614286
26	Treadmill Bicycle	5	8	4.5	7.3	8	7.5	6	6.614286
28	Half Bike	6	8	6	7.2	7	6	6	6.6
15	Foldable micro luggage scooter	6	8	6.5	7.3	7	5	6	6.542857
1	Segway	7	6	6	7.5	8	5	6	6.5
8	Hendo hoverboard	7	8	8	7	7.5	2	6	6.5
4	LIT C1	5	8	9	7.8	5	4	6	6.4
20	Bionic Runner	6	7	4.5	7	8	6	6	6.357143
39	Cadillac Pool	6	8	7	7.9	7.5	2	6	6.342857
21	Sideways Bike	7	5	3	7.2	8	8	6	6.314286
25	Street Flyer	7	6	4.5	6.5	7	7	6	6.285714
3	Solowheel	6	7	4	6.8	7.5	6	6	6.185714
23	Recumbent Bicycle	6	4	4.5	6.2	8.5	7	6	6.028571
41	Walking Ball	8	4	4	8	7	5	5	5.857143
24	Twicycle	7	5	3	6.8	7.5	6	5	5.757143
36	Screw Drive Vehicle	5	4	6	6.9	7.5	5	5	5.628571
31	Suitcase scooter	5	5	3	6.6	7	5	5	5.228571
9	Walk Car	4	6	3	6.4	7	5	5	5.2

Figure 45: Review result

After reviewing all vehicles average scores took into consideration and top 3 vehicles were chosen.

Hence Bionic boots, Lexus Slide and all-terrain vehicle was most fun and exciting vehicle among all

06

Classification of fun vehicle

Based on result of experiment 1 these clusters formed. Each cluster represent for certain aspect of fun experience is explained below

Cluster 1: Electric self-balancing: In this category, all vehicles are driven by electric motor and self-balancing is a prominent aspect which pops out. Self-balancing or element of struggle to balance is a fun inducing feature in this category.

Cluster 2: Bicycle: Bicycling yet weird way of bicycling is a key feature of this category. various posture as well as offbeat experiences while riding bicycle and making regular bicycling experience to un natural bicycle experience drives this category.

Cluster 3: Hover: levitating and hovering is the major aspect of this category. This category is all about hovering and levitating.

Cluster 4: Speed: Thrill in speeding is the key experience represent this category. Raw power, masculine nature, control yet leisure goes into this cluster.

Cluster 5: Skate: crazy ways of skating is representing this category. great technological collaboration combined with absolute madness signify this category.

Cluster 6: Bionic: Experiences of running like kangaroo and crawling like spider are the fundamental feature of this category. Motion inspired from nature represent here.

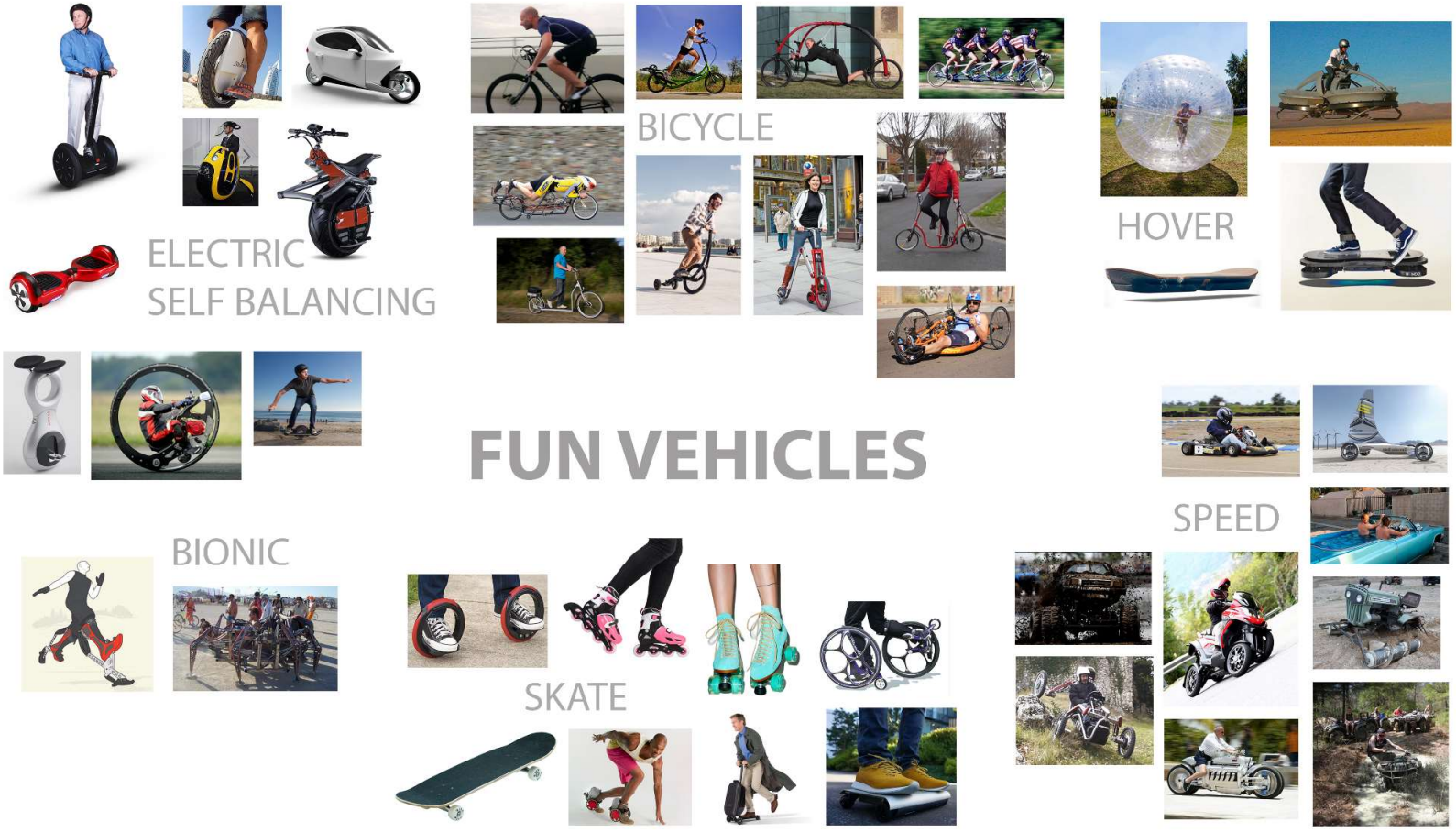


Figure 46: Classification of fun vehicle

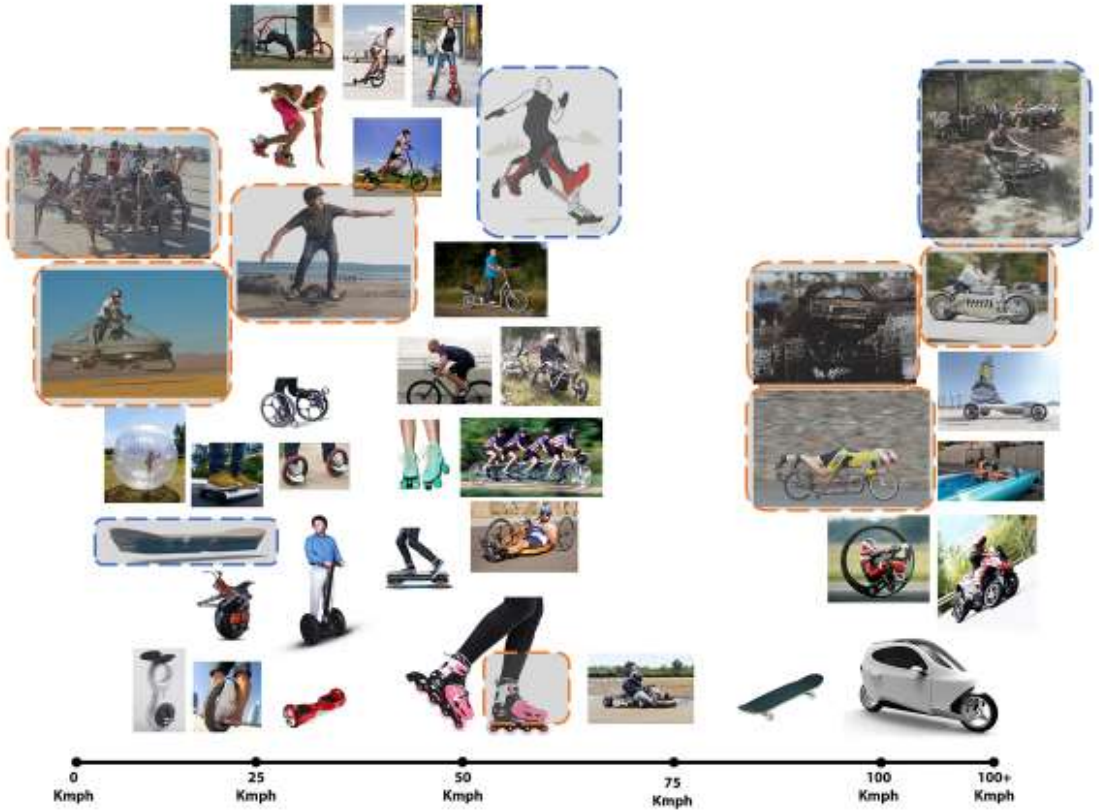


Figure 47: Mapping of fun vehicle

Fun experience is related to following factors

- High speed
- Self-balancing
- Levitating
- biomimicry

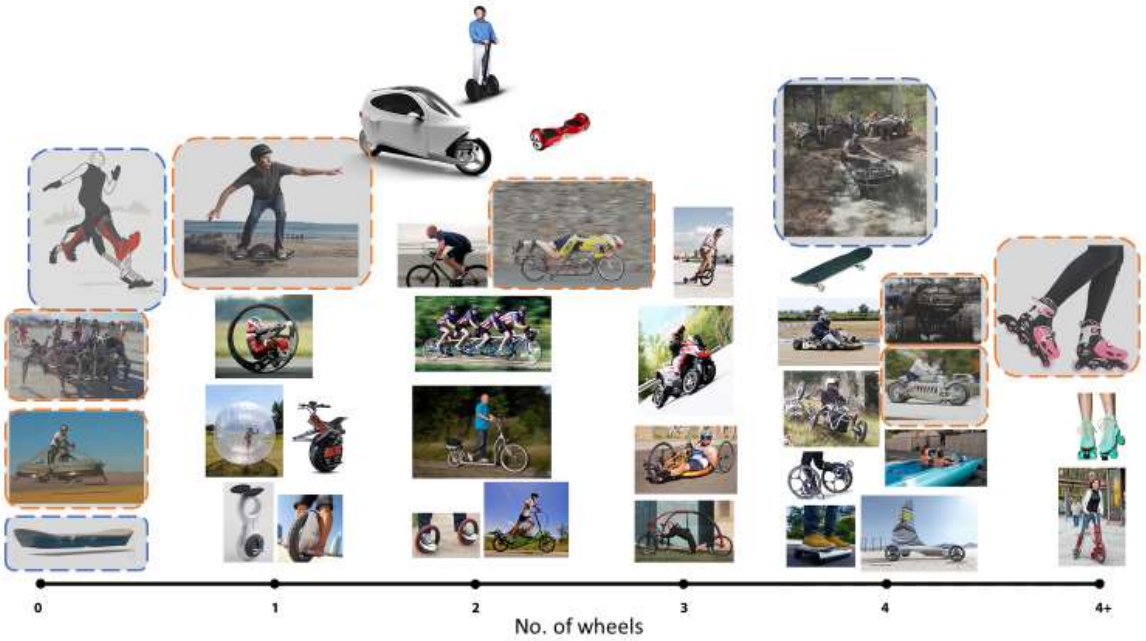


Figure 48: Mapping of fun vehicle

This map shows how no. of wheels affect the fun experience as clearly seen here no wheels or single wheel induce more pleasure. Unexpected nature of vehicle persuades great enjoyment and pleasure.

07

Conclusion

Conclusion of this study/research

1. Fun experience give vehicle across globe were identified and did in-depth study of each vehicle. High speed, Self-balancing, Levitating, biomimicry are the experiences which evoke fun.
2. All fun vehicle give unique experiences yet few experiences are closer to each other those experiences are being clustered together clusters are as follows.

   a. Electric self-balancing

   b. Bicycle

   c. Hover

   d. Speed

e. Skate

f. Bionic

3. Bionic boot, Lexus slide and ATV are the top fun giving vehicles because of their unique experiences.

08
Limitations & Future Scope

Limitation of the study

- All study is done by one individual, because of that views and results may be biased toward individual. Selection of vehicles can also be biased toward previous knowledge of individual
- This study is done using content analysis method, here context of speech is clearly missing. All the data mining test only focuses on content not the context of the data.
- Lack of proper data: data is gathered from original product specification web page. When that data is unavailable critical review data was taken into consideration. When this data not accessible that time news articles were compiled. Thus, uniform data medium is not there.

Future scope

- This study will help to convert or create everyday regular vehicle into more fun inducing vehicle.

- In this study reviews were taken based on past experience and visuals. Further work may happen through actually experiencing set of vehicles and then concluding most fun experiencing vehicle

09
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