

Impulse

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TU/e home transfer

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Executive summary

This report contains the explaination of the concept Impulse, its specifications, user test results, the design process it took, and the author's reflection on the overall project.

Concept Impulse aims to provide a public space in the pub street, Stratumseind, Eindhoven where people could express their negative energy responsibility through the form of art, to suit the design challege given. For some people, expressing this negative energy is healthy for them because they are able to release the tension they have.

Users could kick, throw, punch, or squeeze the ball against the projected screen; animations of fireworks would be projected on the contact point on the screen. The particles of the fireworks would eventually become a part of a painting overtime.

The core chosen materials for this design were: Hitachi CPAX3003 projector, HD webcam, HDPE, and a computer. The computer runs the software Processing and processes the feed from the camera and makes changes to the projected animation. Almost all of the materials selected were designed for lifecycles after Impulse.

The (social) interaction not only provided users with positive experiences, in favor of Impulse, and potential promotions to the street to boost sales to satisfy stakeholders, but also has a zoning effect that could help attract negative behaviors together, and repel those who don't want to get involved with to potentially lower or move negative behavior happenings else where in the street, through a user test and analysis.

The author went through 3 iterative design processes, of which the ideas differ from each other. Since the design approach taken this time is new to the author, he had gained insights in SCA, IT, DRP, and his identity.

Introduction to the project DPI46

Designing social interaction in public spaces

The design challenge in this project is to find ways to design a physical locus of interaction, a specific, physical device that opens the 'digital' action possibilities of a city to the physical ones. While the context is the city, it is up to the designer to focus on the design challenge within that context. How to let a 'generic' device grow into different meaningful forms and shapes dependent on the context of use, or the specific location in a city, and how to operationalize the concept of context dependent action possibilities.

System and service design is a new challenge in the field of Industrial Design. It breaks the 'one person – one product' dictum in favor of a system of (interactive) products consisting of many 'nodes'. The systems under investigation are woven into the social fabric of our lives and form, more than ever before. an integral part of it. Societal relevance is not optional but a necessity for this new field of design. Currently the cities around us are coming to life in the digital world. How this digital city becomes meaningful to us remains to be seen but the first signs point towards visual solutions that augment the buildings, bridges, statues etc. in the cities with large projections and displays. The augmented layer can be used as decoration, but also as public media where the social interactivity can kick in. The augmentation can happen on existing structures, but also can be an integrated part of design when it is on the drawing board. You are encouraged to find new areas for this system to grow in, within the limits of the design challenge. One way to approach is

with interactive public art installations. The current development in digital public arts involves a significant amount of new carriers in not only material, but also in technology, resulting in new dynamic and interactive forms that require artists and designers to construct their work from a system view and with a good understanding of humansystem interaction and related interface technologies. It is no longer about carving stones and casting bronze; it is time to sculpture the interactive experience. The design challenge in this project is to find ways to design a physical locus of interaction, a specific, physical device that opens the 'digital' action possibilities of a city to the physical. Inspired by the theory of affordances (ecological perception) and phenomenology that identify that the (physical) world is a meaningful place and that focus on the lived experience we want you to focus on meaningful and rich interaction. Think 'morphing' shape rather

than changing graphics; think physical controls rather than touch screens; think specific rather than generic. This project will be executed in cooperation with students from School of Digital Media, Jiangnan University, at the Center for Social and Cultural Computing in Taicang, China. Selected students will be travelling to China during the SDL weeks, working together with their Chinese team members.

In this project, students will be able develop their attitude, skills and knowledge by taking ideas and concepts to a working prototype with advanced technological means and form giving, working in a special socio-cultural context: China. ¹

¹ "Design for Social interaction in Public Spaces – A TU/e DESIS Lab project^{*}", Eindhoven University of Technology, http://w3.id.tue.nl/fileadmin/id/Education_Documentation/ Project_descriptions/1314-S2_Out_of_Control.pdf, (January, 2014)

Hummm.... What if?....

A little bit of background and...what sucks?

There are many different negative emotions and behaviors around in our world today, and there is no exception in Eindhoven either. Although their reasons differ from one another, people still have similar ways to express or control their negative side. They usually have to do these actions in private, because it is not acceptable or appreciated in public spaces, except in certain contexts that take place during the day mostly (sports, funerals, etc...); but what happens when you don't have access to a private space or your private space isn't suitable anymore to express these negative energy due to various reasons?

A call for a public space where people could express them appropriately and publically appreciated is needed. While nudity is not accepted in public due to the norms of our society, it is accepted in the form of art; could we then channel these negative expressions, capture them, and convert them into the form of art?



Negative energy and expression

What is it?

Negative energy and expression refers to a range of different levels and forms, and due the way Impulse is designed and the place where it is designed to be placed in, the one that is focused here is only from physical limbs movements and all negative energy levels.

Common reasons for negative energy to surface in this particular place isn't only in the form of aggression from alcohol intoxication for some people; but it could also feel like being destructive in a positive manner after intoxication or while they aren't intoxicated at all. This energy could also surface even if they aren't intoxicated at the time, they could be accumulated overtime or come from different aspects in their lives.

For some people, expressing this negative energy is healthy for them because they are able to release the tension they have. If they choose to exercise long enough, they could help release endorphins in the brain, which could help relax and could potentially be able to think clearly or feel better after.













Impulse

A quick brief and what can we do about it.

Impulse's aim is to provide a social interactive space where people could express their negative energy appropriately in public, through channeling their actions into a form of art or game.

The installation will be placed in Stratumseind, a famous pub street in Eindhoven. The social interaction this installation provides could allow people to experience something positive together to contain or prevent negative behavior from happening elsewhere in the street.

As well as making people aware that they should either stay away from this area or the people who has just interacted with the installation. Interacting with it is simple, just kick, throw, or punch the ball towards the wall and see what happens!



Social interaction

Designed.

Social inteaction has many different forms, anti-social, pro-social, direct, indirect, live, or overtime.

The intended social interaction of the installation are the following:

1) Relieving and sharing negative energy by creating positive experience together with others, through interacting with the installation together and chatting with one and other

2) Attracting people with similar behavior to an area and repelling others, through experiencing with the installation, watching from aside or online and hearing about it (zoning).

3) Entertaining others at the moment and over a period of time, whether the person is interacting with the installation or watching from the side, they are being entertained. Especially over time, because a collaborative piece of art work is created.



Scenario

What happens?

User(s) approach the installation and kick, punch, or throw the attached ball towards the projected surface. The projection on the surface before the ball hits the screen is a tinted image of a circular target (the same one used in a range). Once the ball has hit the screen, an animation of fireworks will be popping up from the bottom of the screen towards the contact point of the screen and exploding around the contact point. Some of the particles from the fireworks will be remained on the screen to create an artwork overtime.















Storyboard

How would it go for Peter?

Peter is office boy that works at Kik five times a week, however, his boss kept giving him a hard time at work because he often has to work overtime. After work, he often want to relax; thus, he goes out to Stratumseind to hang out and have a drink with his friend Alex. While looking for a bar, Peter noticed the ball and decides to have a kick at it. As Peter was kicking the ball, he told Alex about what happened at work that day.

A stranger, named Tory also noticed the installation and wanted to kick with Peter. As they were kicking, they shared stories and jokes with each other and enjoyed their time kicking the ball at the installation. Peter was also relieved after this experience with him, The words spread around Eindhoven that Stratumseind has a new installation, and attracted Tom to try it out. Tom invited Nika out at night and suggested to go visit the installation, however, she rejected the idea because she feels there will be a lot of aggressive drunks that she doesn't want to get involved with at the area around the installation.





Stakeholders

Who cares?

There are 4 different stakeholders in this project besides the university itself for offereing this project, and they are the following:

1) The visitors of the street

2) The municipality of Eindhoven and the police force

3) HET LUX LAB (HTL)

4) Bar owners of the street





All of these stakeholders have something in common in what they look for in this street which is: public safety, by means of lower the amount of aggressive incidents towards another person by containing or changing behavior in the street. However, they also look for other specific elements.

1) The visitors: they look for experiences in the street, they visit Stratumseind because they want to enjoy a good evening of fun through different happenings the street has to offer.

2) The municipality of Eindhoven and the police force: Not only is safety they concern, but also boosting the local economy by promoting the street to help business owners in Eindhoven. 3) HET LUX LAB (HTL): the government, organization, and university funded lab is researching ways to provide the street with new concepts, while satisfying the visitors with new experiences, the government with a safer environment, and the bar owners with more promotion ideas to increase sales. HTL was the client of this project. They are primarily focusing on how to lower aggressive incidents in the street by experimenting with different technologies.

4) The bar owners of the street: Profit is their number one priority. They would only be concerned if developing something within the street would bring them more or reducing their business opportunities.



Name: Vero Vork Age: 28 Gender: Female Ethnic background: Dutch Occupation: Sales / waitress Education: HAVO After finishing her high school diploma, Vero decides to stop her studies and start working. She works from 11:00 to 20:00 during the weekdays at Primark and works from 15:00 to 22:00 on the weekends at a Chinese restaurant in the downtown area of Eindhoven. Vero lives on the north side of Eindhoven and she needs to take the bus to work or to go home every day. After her stressful day at work, she enjoys hanging out with her colleagues at bars to relax and vent out some of the problems she had at work that day. Vero is also quite short tempered, she would start screaming and smashing plates whenever she is angry at home.

Lauren is one of the bar owners in the Eindhoven pub street. Since the leaving of her husband and her only child, the pub has become the only source of income she has to sustain herself. She spends most her time running the pub, and attending municipal related meetings for city development. When she has free time, she likes taking her dog out to park, and volunteer for charity.

Name: Lauren van Dolder Age: 62 Gender: Female Ethnic background: Dutch Occupation: Businesswoman Education: Bachelor B.A.





Name: Nikhil Smith Age: 36 Gender: : Male Ethnic background: Indian Occupation: Engineer Education: Masters M.E. Nikhil is a project manager in both Phillips Eindhoven and Philips Amsterdam. He travels back and forth between the two cities by trains at least twice a week. While he is waiting for/in the trains, he often reads the e-books on his tablet or managing meeting schedules on his cell phone. Recently arriving from Austrialia, Nikhil is curious about the European artistic culture, and likes to share his experiences with others, as well as keeping frequent contact with his family and friends back in Austrailia through Skype calls while he is not at the office. Work and family isn't everything for Smith, he also enjoys playing cricket and visit att exhibitions or galleries as a form of relaxation to satisfy his curiousity.

Why Impulse?

Besides fun... what else?

According research done by Sophie Brenny and Jun Hu at the Eindhoven University of Technology, personally leaving a mark in the public increases people feeling of inclusion and connectedness in that particular space.² By having some of the particles from the generated fireworks as part of the overall art piece, it is possible that the installation would form a bond between the user and itself, making the street more memorable and approachable the next time if the user choose to revisit the installation. It could also be become a point of connection between different people. The flexibility of the installation allows different forms of interactive experiences in the street for different events, as a new attraction to the street for bar owners to boost their sales.

The ball has low threshold for people to interact with and also intuitive to most of the public due to it being resembled to the sport football where a majority of the public has gotten in touch with at some point in their lives.

The current state of the street has many problem with aggressive drunk people, Impulse could serve as a zone landmark or containment for likeminded people to gather and repel others away; as HET LUX LAB is also experimenting this zone marking idea through different color lighting.

² "Social Connectedness and Inclusion by Digital Augmentation in Public Spaces", Eindhoven University of Technology, http://desis.id.tue. nl/wp-content/uploads/2013/10/SocialConnectedness-DeSForM2013.

Opinions & views

There are many ways to relieve stress, anger, and other negative emotional behavior, but impulse is an alternative which one could consider when they don't have a private space to do so, or if they want a different experience in this relieving process. Besides doing sports where negative energy could be expressed in an acceptable manner (turning negative energy into motivational energy), one would usually hide their negative emotional side to try and wash it away in most situations in public. However, Impulse is where it allows, accepts, and appreciate such negative expressions without the need to hide so much if one chooses to.

It was suggested by visitors during the June 2014 final demo day at the Eindhoven University of Technology, that this concept could be applied to other settings such as: the hospital, elementary schools, high schools, and office settings. Educational setting because of the bulling that occurs to some of the students in the school, grieving moments and pressured moments in the hospital, and stressed working environments in offices, to allow those people to also release some their emotional energy.

HET LUX LAB is currently looking at combining this concept with some other ideas, like connecting the response with the colored street lighting in the street or different interactive animations that they've had in the past, like projecting a bigger version of the painting on the wall of the building.

Design specifications

Stuff? how much stuff? Explained.

Materials:

High density polyethylene (HDPE) was the chosen material for the frame of the installation, because it is a common durable material used on playgrounds and ice hockey rinks to prevent vandalism and such. It is also upcycle-able, recycle-able, or made from recycled materials. Polyethylene (PE) was chosen to be the screen for the transparentcy that it gives.





Hitachi CPAX3003 ultra short throw projector was the preferred projector for this concept, not only because of the projector could project the preferred sized image at just 0.64m away from the screen; but also with the brand Hitachi. Hitachi is one of the few projector manufacturers that has a sustainable vision within their product line, which is aiming at reducing carbon emisiions by 100 million tons a year by 2025; by acting right now in their product line such as: eco-mode, 1W standby mode, longer lamp life, paint free casing, reducing of carton sizes, recyclable carton boxes, and longer filter life. The projector provides about 3300 lumens, which is sufficient for outdoor rear projection, according to the representatives at Aplusk B.V. The Netherlands.

HITACHI

USB2.0 webcam was chosen to be the sensor for this installation, there are many different webcams out there in the market, but in order to get an accurate reading, it is suggested to have a HD webcam that have at least 1280 x 720p and could operate above 30fps. A recomended model is the SV-B603W by sunvision. It is wireless and made for outdoors.



Lock nuts, nuts, and bolts: Common lock nuts and bolts that are sized M3/M5,



Metal chain: There are many different types, but I would suggest to have the ones like the bicycles locks.





Shock absorbers, this is to reduce the impact the HDPE sheet has on the metal bracket that keeps it intact with the sides of the box. As well as lowering noise from the impact.

3 way corner metal bracket with M3/M5 sized holes: this is to connect the sides together and mount them on the ground or the wall.

Punching ball: The reason for choosing a ball from a boxing installation because they are made to be durable as well as some of these balls already have a metal ring attached to it, so the ball doesn't need to be customized.

Black Diamond Rear-Pro Film 4K 1.4 Gain from Screen Innovations: This adhesive film is made for rear projections, no hotspotting, and has a high gain to provide a clear image in outdoor settings. Computer: A computer that is capable of running processing, USB port to connect with the webcam, and has VGA port to connect with the projector. The computer processes the feed from the webcam to do the sensing and reponse animation in the software Processing.

Extended AV to VGA cable: since the webcam is placed outside the box and away from the computer, an extension cord is needed to connect the webcam to the computer.

Power bar and extensions: since the porjector and computer is outside of the bar, a power connection is needed to bridge from the inside of the pub to the outside.

Cable tubes: these tubes are needed to protect the USB connections that are placed outside of the box to ensure the connections are protected.



Eco-friendly measures:

Besides the manufacture choice for the projector, the material selection of PE, and HDPE, there were other measures as well in this area.

Instead of a springed tiled sensor wall, a webcam took place instead of it. Components reduction not only reduces the chances of it malfunctioning, but also taking a processor out of the equation. Normally, the tiled sensor wall would need an Arduino of some sort to function before connecting it to the computer then to processing, now the webcam directly connects to the computer directly. The webcam also provides a more flexible life direction afterwards, making it more applicable to other products. This goes for the projector, bolts, extensions, brackets, and the computer as well, assuming that they are still working after the life cycle of Impulse.

Metal chain can be down-cylced into bike chains. Punching ball could also be downcycled into other sport playing objects. Cable protectors could also be downcycled into pen shells.

Leaving only 1 item in the material list that isn't recyclable, which is the adhesive film for the screen. They aren't recyclable because the protector would be torn off the PE afterwards, and depending on its condition it could be reused in other transparent material to serve again as a screen; but this is highly unlikely. However, If it is not dettached afterwards, it could be cut and made into cup coasters.



- 2 x (1.56m x 0.06m x 0.9m) HDPE board (color) 10 x 3 way corner brackets (M5)
- 1 x (1.62m x 0.06m x 0.9m) HDPE board (color)
- 1 x (1.62m x 1.62m x 0.2) PE board (transparent) 10 x M5 nuts, 28 x M5 lock nuts
- 1 x Computer with Processing installed
- 1 x SV-B603W webcam
- 1 x CPAX3003 Hitachi ust projector
- -1 x (1.5m x 1.5m) SI BD rear-pro film

- 34 x 0.08m M5 bolts, 4 x 0.3m M5 bolts
- - 4 x M5 shock absorber rubbers
 - 1 x Punching ball, Bike chain (2m), power
 - extension (2m, 8m), AV to VGA extension
 - (8m), r = 0.01m Cable protector (8m)

The installation will be placed up against the wall, held by bolts that goes in the wall from the outside through the metal brackets. The sides of the box (HDPE) will also be held by the lock nuts, bolts, and the metal bracket as well, with the screen (PE) facing out towards the open square instead of the streets. All of the sides will be embeded 0.06m below the ground level to give the installation more stability like public lamp posts.

The HDPE sides will also be using 3 times the standard thickness as the ones from playgrounds (0.02m standard, now 0.06m).

Using the online calculator provided by Aplusk B.V. The Netherlands, the image will be 0.3m above ground even if the projector is on the ground. Thus, placing the projector underground and having the lens on ground level could reduce the size of the box. The projector would of course placed inside the box as well for security reasons. Maintance and making adjustments to the content of the installation would also be simple, since the sides of the board could be unbolted by unscrewing the nuts on the sides of the board.

The computer which controls everything about the installation would be placed on the ground level, inside the box and next to the projector.

All cables and chains will be wired underground or through the wall of the bar, and into the box. The webcam cable will be going through the light post first though.

As provened at the final demo day prototype, the thickness of that piece was 0.05m and it withstood all impact without breaking, it is now multplied by a safety factor of 4 (0.2m) as the impact the the public might be larger.

Since the webcam is adjustable, the angle can be decided when installing, but it will be placed on the light post, facing the box.







^ℓ Useless... [∧]

Weird...

User Testing

What do people think about this?

The purpose of this user test is to find out:

- How much people are in favor of this concept?
- How efficient is the installation at providing a public space for people to express their negative energy?
- How efficient is the installation at zoning the street? Attracting/repelling people from/to this space?
- Does or how well does it help containing or prevent negative behavior in the street?
- How much does this installation add/take away from visitors' experience in the street?

Random people were approached and asked in the Stratumseind to see if they would like to participate in user survey. If they agreed, then they were informed verbally that they will stay annoynomous and their results will be used for this project only. be asked to do a task. After they have done the task, then they were briefed about the concept, along with supporting documents (story board, render pictures, videos of the prototype, and scenarios). A survey was filled out after they have done all of the above. 40 users were asked and did this test to get a reasonable a data base for analysis. Using the data collected, an analysis was perofmred to answer the questions set out for this user test.

The results of this analysis will determine whether HET LUX LAB should proceed with the concept in Stratumseind, and how should they proceed if they were to. Step 1: The task

The instructions given to the users was to create fireworks.

When the ball hits on or near the target that was on the groud or on the wall, a paper picture of the fireworks was manually placed at the spot where the ball was hit. This was neccessary for the users to get a feeling of what the installation could be like, to stimulate the target side was a projection screen that reacts to their actions.

95% of the users has gotten the task right, which means that the ball and target worked well, because it was intuiative to them that the ball needed to hit the target either by punching, throwing, kicking, or pressing. This represented that the way it was set up with the ball on a rope, could afford different ways of interacting with the installation. Step 2: Briefing

Users were briefed verbally and visually on the spot after they have completed their task. The material said and shown to them were the same material shown here throughout this report.

Step 3: Survey

The following questions were asked:

Age:

M/F:

What is your First impression of the installation and why?

On scale a of 1 – 10 (10 being most desired), how much do you like this idea?

On scale a of 1 – 10 (10 being most desired), how much would you like to have it in the street?




What have you expressed through interacting with the installation?

Even though the others around you might find this installation not appropriate due to its way of interacting with it, why did you still interact with the installation?

How do you feel after interacting with the installation?

What impression would you have on this area of the street if this installation was to be placed here permanently? Would you be attracted or repelled from this area in the street?

What do you think of the others who are interacting with it?

How much on a scale of 1-10, would you say this installation has add/takeaway your experience while you are in the street? (10 = more positive experience, 1 = more negative experience) and why? Would you think this installation would help contain or prevent negative behavior in the street? How? And how much on a scale of (1-10, 10 being the most helpful)

Any other comments?

Step 4: Results

For the full documentation of the data gathered please visit: <u>https://www.dropbox.com/s/iek5y1qomhe5d9i/User%20evalutaion.xls</u>

11 females, 15 males, aged between 18 -35 were questioned for this test.



About 90% of the people thought it was a good idea, while the other 10% thought it was either weird or disliked it.

Out of 100%, the concept scored 73% in whether people like the idea, and 67% wanted the installation permanently in the street.

About 60% of the people expressed happiness/joy, while about 30% of the people expressed frustration/anger, and 10% of the people didn't feel like they were expressing much or have expressed other emotions.

About 80% of the people would still interact with the installation regardless of others' opinions because they fun was their priority, about 10% of the people just didn't care about others, and the other 10% of the people had other reasons or wouldn't interact with it if others were watching. About 90% of the people feel relieved or positive after interacting with the installation, while the other 10% didn't feel much afterwards.

73% of the people thought the area would be positive and attracted to it, while the other 27% of the people throught the area would be negative and stay away from it.

Using 50% as the mark of neutral point, people thought it was add positiveness to their experience of the street overall, scoreing at 65%.

Again, using 50% as the mark of neutral point, people thought maybe it would help contain or prevent negative behavior, scoreing at 58%.

Step 5: Analysis

Q1: How much people are in favor of this concept?

A majority of people are in favor of this





idea (90%). To evaluate how much they like this idea, the score from the second and third question were combined. Since the third question of having it placed in the street permanently would indicate that they really like it rather than just liking it, so the weighing of the second question was divided by 1.5, while the total score from both questions were added up and scored 58%. Which means the public were in favor of the concept, but not strongly.

How much they liked the idea



Q2: How efficient is the installation at providing a public space for people to express their negative energy?

Only about 10% of the people didn't express or expressed other emotions

through the installation, thus the installation does a well job at providing people to express their negative energy. Although 60% of the people expressed happiness through it, 30 % of the people also expressed frustration or anger, which meant the installation provided for different people at different emotional times, because 80% of the people would interact with the installation because is fun, about 20% of the people would interact with it regardless of what other people think, and 90% of the people felt relieved, happy, or positive after expressing themselves through the installation.

Q3: How efficient is the installation at zoning the street? Attracting/repelling people from/to this space?



70% of the people said they would be attracted to the space, and 30% of the people said they would have a negative impression of the space

and would prefer to stay away from it. Looking at the 30% of the people who answered they would have a bad impression of the area, regardless of gender, they all thought the area was scary, dangerous, or don't want to get involved with drunk people. However, the 70% who were in favor thought the area is fun or positive, and would approach the area. Which meant there was a grouping effect for those 70% of the people, and a opposite effect for others, because if they liked the idea but felt unsafe about the area, people wouldn't be attracted to the space. Thus, the zoning effect would be effective, by grouping them together in a general area to be monitored by the police. Those who answered they expressed frustration also answered that they were attracted to the area in the survey, which also reinforces this zoning effect.

Q4: Does or how well does it help containing or prevent negative behavior in the street? People do think that it would help, but not strongly about it. Scoring only 58% (50% as the neutral point), people felt that either they would be triggered at the installation and carry it around the street, or if somebody is in a bad/aggressive mood, they would stay that way.

Q5: How much does this installation add/ take away from visitors' experience in the street?

People thought it would add to their experience in the street positively by scoring 65% (50% as neutral point). Mainly because it adds new experiences in the street in a entertaining way whether is with themselves or together with strangers through the performance or the piece of art. By looking at their first impression of others interaction with it and their own impression of the idea, a majority of the people said they like the idea on its own, but also about half of the people thought the others who are playing with it are also fun with play with.





Final demo day

Showing off a little bit...

A prototype was put together to demonstrate to visitors and HET LUX LAB what I have in mind in a way that they can experience it.

An interactive screen was made with a frame of wood and PE, a webcam and computer as sensor, and a project as feedback. A simple processing sketch was made with a traget in the center of the screen, which reacted to where the ball was hit. Fireworks will be drawn on the projected screen at where the ball was hit. The general feedback was good, and HET LUX LAB would like to proceed with this idea and experiment with it in Stratumseind.









Conclusion

Where everything comes to an end... perhaps...

In conclusion, Impulse is concept that the public favors, through providing a public space where people could express their negative energy and feel positive after, whether is through the art work or the performance alone. The social interaction involved (watching or participating) could create a zone in the street by means of attracting and repeling people in the street. Whether the social experience could reduce negative behavior of the street is another question that HET LUX LAB should continue on researching in their experiment; by placing the installation in the street and count the total amount of negative behavior happened in the street, happened around the area of the installation, and other areas of the street with the help from the police force. Since the results from the analysis is only from what some people think might happen, a proper test would verify this. More interviews with the people in the street is also recommended to get more insights to this matter.

Impulse also satisfies the wishes from all of the stakeholders, by introducing a new, entertaining, and positive experience to the visitors of the street, promoting the street for the government with this new sight as well, and could bring more profit to the pub owners with new business plans or just simiply because there are more visitors. It also fits with Het Lux Lab's goals, by designing for all parties. It meets the challenge of the project "physical device and interactions that opens a digital layer and the possibilites in the city in a societal context", with a ball that users could input in different ways, digital layer of projected animations, new possibilities to the city with a unique space and business models, and in the societal context of public behavior. Last but not least, Impulse was also designed with sustainability in mind, by reducing materials, product choices, and durability.

Design process illustration map: impulse



Design Process

How did it happen?

The process began with several random ideas which pointed at different directions to explore what this project could be going for myself.

- Functional eco-friendly actions
- Entertainment

1) Wish tree: inspired by the love lock bridge in Paris and the Chinese wish tree rituals, the concept aimed at reducing material and wastes that these places have at these sites by making it digital. A place where people are aware of others wishes and also sharing them with others, becomes a tourism symbol and new rituals for others. 2) Dine out OK: This concept aimed at trying to reduce food waste at public restaurants by peer pressuring people to finish the food or taking it away with them. It also introduces a new dining experience at the table.

3) Washroom music: The restroom was an interesting space in public for me since it is both private and public at the same time. It was an entertainment concept that aimed at making others aware of others actions in the washroom and co-creating music in the bathroom according to each other's actions in the washrooms, introducing a more playful experience in the public bathroom.





CONCEPT : TOILET MUSIC 60000 d Do 20 0 MUSIC WILL PLAY WHEN YOU USE THE BATHROOM, COMPOSES MUSIC OVER TIME. THE LONGER SOME ONE USES SOMETHING, THE WORST TUNE THEY WILL ADD TO THE COMPOSITION. SLAY LEUNG 02/14



While making a decision for the end of iteration 1, I chose the wish tree concept to proceed with because I liked the sharing stories and eco aspects from this idea, because of my vision about being eco-friendly and sharing stories is what get people talking with one another from my traveling experiences. However, while searching for a public space which suits this concept due to the fact that it is in the form of a tree was difficult because it is based on Chinese traditions and isn't very suitable in the Dutch context. Thus, I adapted it to people who are travelling on trains based on my personal experiences, which became the prototype concept of iteration 1. A self-generated power supply for using the concept while using the system was added to emphasize the green aspect of the concept. As well as changing the way people share stories on the train from text to audio, because I wanted to give people's phone a break to charge while giving them something to do while in the meantime.







A user test was carried out to see whether people understood how to use the concept in the shape I have made, and a user test was also carried out to see whether people would like to share stories or read stories.

Rasel

1) Test in the elevator, elevator was chosen to be the setting to test out this story sharing idea, because it provides a similar setting, waiting to get from point A to point B. A box filled with quotes were placed in the box, and the amount of people wanted to read or write quotes were counted in the elevator. The experiment was carried out on a Friday afternoon, in one of the elevators in the Eindhoven university of Technology. About 60% of the people who passed by reached out for a quote. Some even stayed longer to speak with another or add more to share with others

2) Several potential users were gathered to fill in a survey about their behaviors on the train, then they were given 4 different tasks to see whether they knew how to interact with the cardboard model.

Data results could be found here: <u>https://www.dropbox.com/</u> <u>s/2lsqs0ifofwwc31/User%20feedback%202.</u> <u>pdf</u>









Markys, Fridge, sometry on weekandy 11) What gets you to talk to strangers about jokes, states, or opinions? u, sully u fan propu falk to well in west les. D In the tonin possible as (6) 5) Have you ever had your devices (tablets/phone) run out at battery during your travels? $\sqrt{2}$ 5 3) What do you usually do when you are waiting for someone/transport at the station? Sue 4 4) Do you bring your tablets(le: iPad)/ smart phones (le: iPhone/Galaxy) for your travels? 9) Do you find sharing them face to face harder than not sharing them face to face? $N_{\rm D}$ 7) Have you ever shared stories/ jokes with a stranger when you are waiting in the station? The would you improve/ what would you change on this device in terms of charging $\frac{1}{2}$ whices and other areas? $|V_{s}-c|$ be used for research and education only. It will not be sold or used in any other way other this test is needed in a presentation in any way, your name will be switched to the code name of User $\frac{1}{2}$, and your face will be blurred or taken out. By signing below, you have thank you for participating, your personal information and your answers to this survey will 12) How would you improve/ what would you change on this device in terms of sharing and receiving audio messages? Lev or these heals by mature or sharing than documentation and as data for the design itself. It, the results, photos, or videos of a scale of 1 - 10 (10 being the easiest), how difficult was it do Task 12 29 39 49 NF Age: 20 confirmed that you have tully understood and agree to the above. 20 miles 5 miles 10) Have you traveled using the ov card for trains or buses in the last 3 days? 6) Do you find the above annoying if that happens to you? $\sqrt{e_5}$ PLEASE READ CAREFULLY wid you like to have this in the stations or airports? Thank you 2) How long do you usually wait for buses / Trains? 1) How often do you use your OV to travel? Rache Name (Last, First): Nobolish Signature: 8) In the train? No

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After discussing the concept with coach Jun Hu, it was suggested that the ideas were functionally driven and there isn't much of a connection to the environment that is being placed in, due to the concept's social interaction didn't serve a particular purpose; as it was only facilitating the tool for social interaction, which is the cell phone as people use it to chat and play games with one another online. Although this all made sense to me as I approached the design the way that I have been, which is approaching a design from a functional side first then deriving and connecting the abstract idea after, and exploring the field of interaction design through fusing with a eco-friendly product and people's daily behavior; the abstract story and concept didn't have much of an emotional bond with it which made me believe that interaction design isn't only about figuring out how the users will interact with the product and making it intuitive, but also the purpose of the idea should also connect with the people who will use them. Thus, I set out exploring what

is it like to approach it from the concept side for iteration 2.

I decided to drop my strong thinking on approaching every idea from the eco-side, and see what happens when I don't do that in this iteration. It began with dropping the phone aspect of the previous end concept from iteration 1, and just testing this information sharing aspect at the waiting areas of the station. It turned out that people don't do that in the station at all.





Thus, switching gears to trying to promote anti-social spaces on the train, because during train rides some people do talk with each other even if they are strangers and shared the same experience from the previous user survey, but what if that was reversed? A few ideas using different approaches were generated, ranging from using lights, sound, text, and physical objects to divide space or indicate to others that they wouldn't want to interact with others. After a survey at the station, people preferred physical dividing spaces and having text news on display to direct their eyes away from the others. I felt like this was designing first class cabin spaces in flights which wasn't very interesting for me to continue with.







Using reverse thinking again since people prefer not socializing with one another, how could I make train cabins a more social place to be? Approaching it from an on train entertainment point of view where users could play with each other to kill time as the direction, I set out to develop a game that shows the playfulness of the public bathrooms on the train which was a combination of one of the ideas from iteration 1.

After consulting coach Jun Hu about this idea, the question of why should this installation be there to help people kill time on train rides remains and the idea of killing time vs boundaries of the public bathroom was confusing in the idea. Running towards the end of iteration 2, I decided to drop the bathroom aspect and continue on with a game people could play with each other on the train and make a prototype with processing to communicate this idea. It started with an extreme case, which was a game that determines whether the train will skip the next train stop. Users will have to enter the game through their phones, and type in "skip" or "stay" into the system. The system will randomly choose one of the inputs as the factor to stop or not at the next station. If the input is not one of the two expected response, it will be randomized again until it finds one. If the system can't reach an answer before arriving at the station, it will skip it regardless. This extreme case forces people to interact indirectly.

Although the extreme case would be fun to do, it wouldn't suit the public, so I had to take out the part where it skips station, and turn it into a game on a screen whether it kept the element of having everyone's input and randomly selects one. The objective of the game now was to travel around the points, like the game snake as quick as you can, but every newcomer to the game will add a new point on the map.

The code could be found here: <u>https://</u> <u>www.dropbox.com/s/v84ihdrjgxo9dlr/Proto-</u> <u>type.zip</u>

what is the social interaction here? Reaction ?. * Not using an Action us O. A photo exp. is presented for people to talk about or participate together. (should exp). actual we photo Screen shows Silhottee because of Press Red Privacy issues. -a silkette of 2) An "interaction" between the person going to the use, and those outside the we, where the person going is the use is "providing" and an initiation to this at S.I. button "a person in the * or we can take we'ldoing mother a photo while they are their butiess, in the we ard use Those around the we can add to this photo. and take a photo their schoutte later. of who ever it (3) S.I. on App, chat room, as well as people's decision infront of the * If too crowded, button, which could affect others' decisions as well. Projection will either adds to the turn off or projectit silhottee photo. AMARA () PERSON ENTERS on the cibility next to Ho we. Screen on the 1 wolking in sile wall turns on It takes upic office person in the we theve SUPEEN TURNS ON WI STUDNITTE after sometime.), + screen store on the 3 Press Red shows silhouttee person in App platform button the we. for random Selection. ADD TO THE PHOTO (App). a chance to have selected we typingin photo projected Selection on the WC SUNTE door fainy out. ON APP Project on
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Where would you like to go? Eindhoven

Why? Because I have friends there

What would you do there? Go see the PSV with my friends

Click here to add to the Map









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After the midterm IPoC workshop in China, I understood what it is considered a strong concept itself. I decided to drop everything I had before and start fresh. From scratch and inspired by my current emotions at the time, I picked the topic of anger since I was frustrated with where this project was going and see if I could make something for it. It started by questioning about whether the public space has something for people who are also frustrated and are able to express it at that space. It turned out that there aren't many except a few games at the arcade, sporting spaces, and anger rooms in offices. In Eindhoven, I couldn't find much spaces that could do that except the gyms. Thus, I decided to go on with it. Studying the performance of angry actions, I started to explore what kind of actions people do when they are angry. They include: screaming, throwing, punching, kicking, heavy breathing, and squeezing and many more, but I found the actions from the limbs (like punching and kicking) the most dramatic, but when we are doing this in public, is often not

accepted and preferred in general because our norms; yet there aren't much public spaces to do that at night. Thus, I set out to find ways to overcome this obstacle. After browsing around, I found this interesting relationship with nudity in public. When people do body painting as a form of art in public, they seem to be more accepted than just walking about plain in public. Using this same relationship, could we convert these performances into a piece of art then? Can I create an art installation which allows people to express their anger, capturing it, and turning it into a piece of art? As well as getting people to comfort one another by creating positive experiences together?

The inspiration period began with trying out whether the action of throwing brittle objects at walls would achieve the effect that I wanted. What I was seeking was an effect that I could express my frustration through throwing objects, whether the visual result would be pleasing, and see if it would be safe to be doing in public. In order to ensure minimal splash back of projectiles, a mattress was placed in front of the wall. The objects didn't break as expected, thus the visual effect wasn't there to experience; but the experience of throwing object was rich in my opinion because I realized there are different ways to throw objects, and depending on how you throw it, it could resemble different forms of expressions. Having shattered pieces laying in public is also not safe, thus I also wanted to seek other alternatives.

While considering the place for the installation to be at, I wanted a place where people would go at night, because of the options people already have during the day. This place has to be safe and monitored. It was either having a space outside of the city and have it monitored, or choose a place where it already has monitoring systems and within the city. I decided to go with inside the city because that's where the installation could reach more people.

A few options where it could be is at old factories around Eindhoven, hospitals, art theatres, or next to the police station. I eliminated factories, because it doesn't feel comfortable for people to go to an old factory specifically to release frustrations at night because people might feel unsafe, and people wouldn't go to the hospitals just to do that either. As well as the hospitals are busy enough already, there isn't a need for more people to visit it to cause more disturbances. The police station is a good idea and it also happened to be behind Stratumseind, where a lot of people visit during the night. The police patrol around the street often, and there are surveillance camera everywhere around the street to monitor it. I felt that this was a good place to have an installation where people could be responsibly release their anger, and if anything gets out of control, then the police are right there to stop it. There were 5 places in/near the street where I thought it would be great to place it at.









Empty factory next to the street, This was a good place because it is at the end of the street, but this was ruled out because not many people pass by it.

Arts theatre in the center, since the installation includes art, it makes sense that could be on the outsdie of the building. It was ruled out because that area is where the garbage is collected, it is not very pleaseat to have people loitering around it late at night.

Square infront of design huis, the area is great for the installation because is spacious and there are 4 sets of security cameras installated already for security. However, it was ruled out because is hidden behind the public and is hard to get people's attention that there is an installation there.

Mini garden next to the church, it is a great location because is just off to the side of the street and next to the police station, but it is also not very eye catching if the installation is placed there.

The square in the middle of Stratumseind ('t College street), was chosen because is open, is in the middle of the street where there is alot of traffic, the police are always there patrolling, and security cameras are already set in that area.



I went on to search for a solution that could integrate this action, as well as what other senses can Luse to communicate this expression to others in a safe manner and perhaps overtime. Besides visuals, there are touch, smell, tastes, and hearing; and I decided to eliminate touch and hearing because Stratumseind is already very noisy and there isn't a need for more noise and touch because usually anger involves pain and heat and it is unpleasant to have it in that street. I made a mood board of what the installation could look like or what people could do at it, and it surrounded around a game with dramatic actions or effects: and that's when I found cocktail mixology happens to be one of the things that would incorporate all 3 aspects: visuals, smell, and tastes, thus, I visited Café Mundial to have the manager provide me with a few tips on this aspect of what is anger in cocktail mixology. Surprisingly enough, they also used throwing of cinnamon to demonstrate sparks and fire which is one of the symbols

that could resemble anger. Thus, my idea at the time was to have an installation inside a bar, where people can fill their balloons with the alcohol that they felt like at the time, and throw it against the wall. The balloon would pop and create sparkles on the spot with sparkles like sparks crackers, and the drink will drip down into a pool of alcohol, people could tab from the pool of drinks afterwards to get a taste of what anger tastes like. Since the color of the pool would change due to different color alcohol, the pool become a piece of art where it could show different people at different times, that anger could be beautiful or ugly. I took this idea and consulted Yu, a PHD student in industrial design who works with coach Jun Hu about it, and she suggested that anger is a topic where is difficult to capture and it should be more generalized to reach more people in public. She suggested that it should be placed indoor, beware of the scale and range of actions, and change the topic from anger to negative energy.

Although people might express more easilv in an indoor environment. I rejected this idea because is difficult to control what happens inside a room when the doors are shut. I do agree with the topic change and I continued with a relatively large scale action (compare to squeezing), because I intend to have the public space where people could let loose, and the larger scale action people do, the more attention people have around the area, causing more social interaction possibilities to trigger from these statements that people are making while interacting with it. Since it wouldn't be indoor, it will make the pool of alcohol not very hygienic to drink from after all the environmental influences that isn't controllable, so I had to find another way to adjust the elements again. This is when I realized that I'm using 1 form of expression (input actions from the limbs), and outputting 3 different kinds of output, of which 2 of them is not feasible to do in an open setting. Leaving me with 1 input and 1 output, I started to explore the different ways to implement the system.

Up until this point, it was only my opinion on this topic, but what about the others I wondered do others also would like a public space to express negative energy? If so, how and what would they do? If not, why not? I set out to the street at night to see what people would do to a ball just lying in the middle of the street when they know they are free to do anything with it, except stealing it. I gave them some choices to help them out, such as a sign that says "Free!" and "Kick, punch, squeeze, or throw". It ended up with people actually liked kicking in public, regardless of the shape as long as it is about the same size as a size 5 football. because is intuitive for them since is a game that the public is familiar with. After this experiment, I went back to drawing some ideas about how to make it.

I settled with a back projection with a stretchy fabric across the frame because of its simplicity.







Power daugevous. Problem - what do you reed to solve? turn it in to Now can this be achieved Art to be accepted. Research (know your audience public to be accepted except the ring Ispoils field (figue out examples (Nudity is a good one Yniko Nudity is unaccepted in public, except in the case of art, Com anyon be accepted using this reduce as well? why should it be decepted. chanded anger - non controlled, stalenant to show people, when you are forced out of your private space, the Cun express this emotion in a healthy maker , when lash out or restrain ? - Wheathy have is to drike.













ZPIRs -1 web Cam - Movement KICK, ME? 1/3 foan balls - Kick 1 perplex glags - Projection 1 Projector - Projection 1 CPU. - Projection + Sansing HIJ HIT ALI O FIT HIT O HITO HIT 1 Ardinino - Sensing 18 distance sensor .- Sensing. Wood. Fabric: shetchy dioopm.



When the ball hits the fabric it would show a displacement where the webcam could track the difference. However, this method wasn't feasible because is a piece of fabric which is hard to prevent vandalism as coach Jun Hu pointed out, and the camera couldn't track the displacement on the fabric well when the ball make contact with it. He also suggested to use force resistant sensors and make a tiled wall sensor, but I rejected this idea because there are many components that needs to works together and to be placed in an installation that people purposely vandalize and having more parts could increase the chances of malfunctioning. I consulted Dr. Mathias Funk for advice, and he advised to use frosted glass as the screen since it is semi-transparent on both sides and the shadow of the ball would show on the other side, and he also agreed that using a webcam instead of a tiled wall would also work. Frosted glass is expensive and not very durable, so I decided to go with PE for the prototype with frosted window sticking films. Along with the knowledge that was

learned from the China trip on processing, I set up a mini experiment to test whether the camera sensor would do position sensing accurately and whether I could change the animation on the projection screen with it, and it turned out that it did so I proceed on with it. Since there aren't anything shattering or to smash with, the effect that I wanted from the previous exploration was excluded and I wanted to find a way to keep it. Fireworks was chosen to be the responsive animation to be projected because it gives a similar visual effect as smashing plates against a wall. While designing the specifications, some changes to the layout of the design has to be made, due to the fact that frosted glass can't provide a screen without hot spotting with the ultra-short throw projector (uniformly spread light across the screen). A new film is needed to act as the screen instead of the frosted one, but the new film isn't transparent enough to have the shadow of the ball shown on the one side of the screen when it is up against it. The camera had to be





















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placed somewhere else in order to sense.

Making use of the landscape, the camera wouldn't be in the back with the projector anymore, instead it will be placed and aimed down from on the top of the pole next to installation. After figuring out the design specifications of the installation and the scenarios, a user evaluation test was conducted to see what others think about the concept being placed in the street.

The first trial test for this evaluation went smoothly, as I only asked the people who were interested about what the setup was doing in the middle of the street; which meant I didn't have them do the survy until they were interacting with the setup. Although the feedback was good, I realized afterwards that the response was biased, resulting the analysis would also be lob-sided. A few scale-related questions were added in the second survey to get a quantitative side of how they feel about the concept as well in regards to those research questions set in the beginning. The anaylsis marked the end of this process.

The processing code for the final prototype could be found here: <u>https://www.</u> <u>dropbox.com/s/x8tthlg8sxpakgj/Mapping</u> <u>Cam_Grid_Particles.zip</u>

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Reflections

Check point.

PDP cross check:

1) Rendering using Rhino - 3D modelling wasn't very applicable to the design process in the project due to the form of the ideas were mainly either an app or just a cube that could be better drawn using photoshop and illustrator. Thus, praticing the quick drawing skills learned from last semester applied.

2) To study and apply provoking design - several aspects learnt here, where provoking design not only could be design to fit daily routines, intuitive actions (ball aspect that reminds people of kicking the ball like football) and desires (from train social interaction facilitating design), but connecting the concept emotionally to the people who would use it makes it even stronger. Connecting to green design, I think it is time for designers to reach people through this method, instead of using financial benefits, fear, or responsibility as a reason to proceed. Finding this bond for products could eventually turn it into a value for everyone; but how could this be found? I believe through this project has demonstrated to me, was through the design brief. The societal context that the brief defends, make it a good foundation starting point to start exploring in this area, instead of seeing a new technology and apply it somewhere because is functional and it can save. An example is that i have a design that is green, is intuitive to use base on its form, fits into your daily routine, and saves this and that, but the question of why is this needed was mostly because I can and the fear of losing more, but if this why question is to be addressed through becuase I can and maybe becuase is tasty, gives a good experience, or I could express myself in it.

3) Activities in the design process compared to my first time going through the project on my own, there were much more explorative and validative activities involved in the process, becase there was a good balance both making and conceptualizing, instead of focusing on making a model/prototype that works. The design decisions made this time around were more about answering with why, why, and why, but not I like it just because is sustainable. At the beginning of iteration 3, the plan made from the beginning was scraped because it wasn't following the same time-table anymore in the process. However, it worked well for the first two iterations, because I got to go through an idea from concept to making a couple of times instead of just going once like I normally would. Therefore, I will continue to use this packed iteractive planning to set dealines, but I won't use the planning style like I did in the beginning where I planned out when to do which activity exactly at which period; because the process is wild and could be going anywhere and

activities might not be applicable anymore. I would like to stick with the deadlines, and plan the activities per iteration like I did for iteration 3. However, it was demonstrated that I need to move even guicker in those iterations because every coach meeting with Dr. Jun Hu seemed to be lacking answers to details to the idea that could be better prepared. Which suggests that I'm not going deep enough into making my design and make my decisions clear. Writing a design brief could help setting the direction early without worrying about the concept later down the road like I did in the first two iterations. By writing this design brief. I could make sure that I have answered the questions to a certain level that I could defend my concept well and find the meaning of the design, and make planning accordingly for the iteration. A lot of user and inspirational activities were integrated into the process this time, which was different than sitting at a desk cranking out ideas; I found out that I'm the type of person where I get most of my inspirations from experiencing the context

myself, whether is being in the situation or just talking to others about it.

4) Improve in integrating technology -Circuitry was practiced in the TaiCang workshop during the SDL weeks, where I had to connect 3 sensors to an Adruino. and connecting the 3 Adruinos together in series then to Processing in the computer and the projected imaged on the 3D surface. I worked Processing and projection mapping worked with a lot this semester, when I had hardly done any projects with it. After making the second iteration's end prototype and the final prototype of the project, I believe I have gone from a beginner in Processing and mapping, to intermediate level. Material selection and specifications were also part of this competency, the level of detail was the first time I was able to do it on my own. The decisions to select what technologies to go with the design for example and how much

Apart from the above...

Professionalism has improved this semester for me, because this is the second time I went through the whole process myself, and the results were much better than last time in every aspect; from quality of prototype and having it work, concept, design approach, time management, and communicative materials. The constant constructive challenging feedback from coach Jun Hu, had trained and gave me a glimpse of what and at what pace the outside is expecting of me. The power of art, was also experienced for me this semester. Functionality creates expectations for people, but art is sometimes more powerful than the function of the design. Take the performance art of kicking a ball in a street where is not normally appreciated from the project, the ball only has to function of moving around, but the performance was powerful enough that it attracted people to play or watch others while over looking at the ball's

function. Looking at the functions of the installation as a whole, the only thing that is doing is sensing where the ball hits the screen and plays the animation on the projector, but in terms of art, the word digital painting would already touch some of the visitors.