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Hello there General Kenobi

As of writing this, we are more or less on track in putting out an Attentie in record time -in comparison to the last one. Yeah, I'm 100% jinxing that right now. Oh well.

So, what can you find here? Well, not much, since it has been little time. I'm going on an adventure through Urban Planning (it is basically a history lesson, but don't tell the reader that). Ruben wrote something on what music does to your emotions. Right now that is pure torture -thanks bud. Speaking of torture, Yannik wrote an article on math puns. So if you think you've learned enough mathematics for the rest of your life, read it and never again be able to take a lecture seriously. Ta-da!

We listened to the feedback provided by you, and have hopefully made it more to your liking. This is usually where I go and beg for new members, but the committee market is tomorrow. Hopefully next edition (or perhaps this one already since -ya know- procrastination) I can introduce you to some new members.

Oh boy here I go jinxing again

Kind regards
Sander de Ridder
Editor in Chief

From the Staff

Eline Marsman

At the time I am writing this contribution, it is almost time for the Christmas break and we are getting to the end of 2019. It was a very important year for our educational programme. It was a year that caused some blood, toil, tears and sweat. Why? Well, for our educational programme to survive, we need to undergo a so-called accreditation process once every six years. This is an intensive process and requires a well-founded preparation.

We started with the preparations after the Christmas break, so in the beginning of January 2019. Educational programmes are commonly being accredited in clusters, but since Advanced Technology is a one of a kind programme, we would be accredited as a standalone programme. This meant that we were free in deciding which accreditation bureau we would like to have. After the selection of a bureau, we drew up a timeline, stating what had to be done, when it had to be done, and by whom.

One of the important aspects of an accreditation process is writing a critical self-evaluation report. In this report, you focus on what goes well and what could be improved with respect to the following four standard: (1) intended learning outcomes; (2) teaching-learning environment; (3) assessment; (4) achieved of the learning outcomes. Additionally, some students contributed to the report by writing a student chapter where they shared their opinion about the programme. Furthermore, an alumni survey was conducted, where 20% of the alumni participated, which was a very good response since the survey was distributed in a short period of time. In September we were able to finalize the self-evaluation report, after hearing the programme committee, examination board, faculty board and executive board.

Another important aspect of the accreditation process is the site visit. Here, an accreditation panel visits the programme and uses the self-evaluation report as the main source of input. At the end of the site visit an (preliminary) outcome will be given. On December 3rd, the Advanced Technology programme welcomed the accreditation panel. During the day the panel conducted interviews with the programme management, students, teachers, examination board and faculty board. It was an exiting day, but there was a very nice, positive atmosphere. As programme staff, we really enjoyed the enthusiasm of all the people involved. We were especially amazed by the involvement and enthusiasm of the students and alumni. We even had one of the Astatine board members make some pies, which were much appreciated by everyone.

After all the interviews were conducted, there was an oral preliminary findings session. After a long day and a long preparatory phase, we finally heard that we passed on all the four standards, meaning that we are safe for the next six years! Of course, there were some remarks and suggestions for improvement that we will focus on the next few years. Overall, we received very positive feedback and are proud of the programme we have today and are thankful for the people involved with our programme.

From the Board

Tom Veldman

Beloved reader,

We're halfway through the year already, and it's time to take a look at where we've gotten so far. With the half-yearly GMA upcoming, quite some things come to mind.

There were lunch lectures from Thales and El Niño, where we got to know a little about what these companies do and how they operate. The newfound idea of lunch lectures by lecturers took off quite nicely, Tracy Craig told us a little about her personal life, her choice to move here and teach at our lovely university.
Astatine's committees haven't been idle either: We've been able to enjoy activities, such as Pumpkin Carving, Sinterklaas, a Karaoke Night and bigger events like the NiCat and the Kick-In. We're very happy to see that the Committee Market had such a good outcome and we're very proud of all of you.

As a board, we have certainly not been out of work either. With the new constitution period coming up, we can look back at the one of September and be pleased by the many good relationships we've built with other associations. We're now entering the time of year where we start on the assembly of a new candidate board and we're quite intrigued by how it's going to turn out. With the moving of Astatine coming up in June, we hope to be able to put together an enthusiastic new board. We hope that this new board will lead the association down a new and exciting road.

I'm quite happy with the current state of affairs and we look forward to an even better second semester.
Stay tuned, for great things are yet to come!

On behalf of the 15th board of S.A. Astatine,
Op de Hoogste!

Tom

Consciousness?

Yannik Wotte

Yup, going for one of the big questions here. There's a tremendous amount of theories, science, pseudoscience and opinions on this topic out there – so I am not even going to try to summarize all of this. Instead, I will present my own take on the topic, and I'd love to hear your opinions. My entire answer sits in the second sentence of the next paragraph, afterwards I'm just motivating how that could be really all there is to consciousness, because it brings making a conscious system within grasp. That is, if we had a test for consciousness.

Consciousness is the quality of being aware of internal and external processes [1]: Consciousness requires self-awareness, so I assume that consciousness already exists within systems that somewhat understand themselves (ignoring the awareness of external processes for now). So I'm assuming that to be aware of yourself, you need to have some understanding, however flawed, of yourself being there. But then "understanding" is still left as a vague concept, so let's try to define it:

(partial) understanding of a concept can be granted when the structure of said concept is grasped. Further understanding follows in grasping structures of deeper concepts behind the first one, and so on. But how can a system grasp the structure (or meaning) of anything? By making abstractions of it!

We humans like to make abstractions and encodings of concepts (and in the further sense really anything) we encounter. Take for example this article as an encoded version of our language. Why do I call the article an encoding of language? Because the letters are only meaningful if you know the corresponding decoding to get from these meaningless ink blotches back to language. Further up, even language itself is just an encoding of other concepts, abstract things in our minds. These are encodings of abstractions in our minds when we take away information with the encoding, only to be added back in with the decoding. An example?
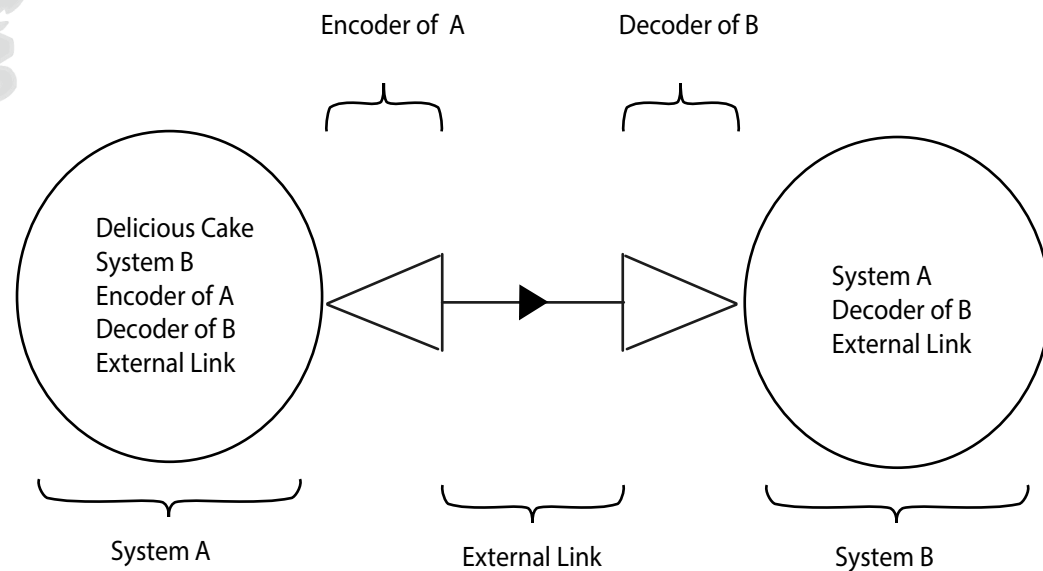
There is a cat on the oak tree in front of my window.

There isn't, and there is not a tree either, but that's beside the point. The point is that these letters you see on the paper are, on their own, fully meaningless. I encoded an "abstract" idea into language and then into ink-blotches, and you decode the ink-blotches back into language and language back into an abstract idea in your mind. This idea in your mind is also much more complex than the ink-blotches themselves could explain. Naturally, your abstract vision of the cat is also a little different from my abstract idea of it – because you don't know how I imagined my oak tree cat combo. In essence, your decoding does not fully resolve my encoding. But that is an issue of communication. A technically meaningless encoding sits in the middle, and it is our mutual agreement on encoding and decoding that gives the encoded message meaning.

This view of communication is clarified in the diagram below: The two circles are

systems A and B, possibly people, and the contents of the circles are abstractions that they have, internally. These abstractions do not need to be perfect, of course. When communication happens, say of the concept of a delicious cake, A encodes the idea using knowledge about the decoding of B, B decodes the message and gets a loose idea of the delicious cake.

According to a certain Douglas Hofstadter [2], meaning arises from abstractions when they correspond to real phenomena: an abstraction has to (somewhat) preserve the structure of the idea it refers to. This concept of an abstraction preserving structure is so important, it (almost) has a name in mathematics: when a real phenomenon and an abstraction have the same structure, we call their correspondence an isomorphism. Besides being what gives mathematics it's meaning, it is also what gives any abstraction in our heads meaning.

Encoder of A   Decoder of B

Delicious Cake
System B
Encoder of A
Decoder of B
External Link

System A
Decoder of B
External Link

System A   External Link   System B

This is so important that good old Douglas Hofstadter [2] pointed out that it is actually impossible to make a meaningless abstraction: as long as an abstraction has any internal structure at all, there is going to be an isomorphism to another structure with meaning. Take natural numbers and their isomorphism to any counting problem. Complex numbers and their correspondence to damping and frequency, among many other things. Music (essentially just vibrating air) and how it gains meaning through its correspondence to emotions.

So let's go back: How can a system grasp the meaning of anything? Let's say we want some system to understand a process. The system would have to make an internal abstraction of this process. It would then of course also have to know how the abstraction works. Likely, because it also made all the rules governing the abstraction. Now it just has to know how the abstraction corresponds to a certain real process (the decoding and encoding bit). Do the numbers correspond to the amount of apples, or does the number 1 represent a color? Once we have this: an abstraction and a way to couple it to real phenomena, we're there: understanding. So making rule-governed abstractions is key to understanding, as it is to know the encoding and decoding of the real process to make it correspond to the abstraction. We basically need a system that is able to come up with an abstraction of itself. Using the earlier diagram, system A would what we call conscious:
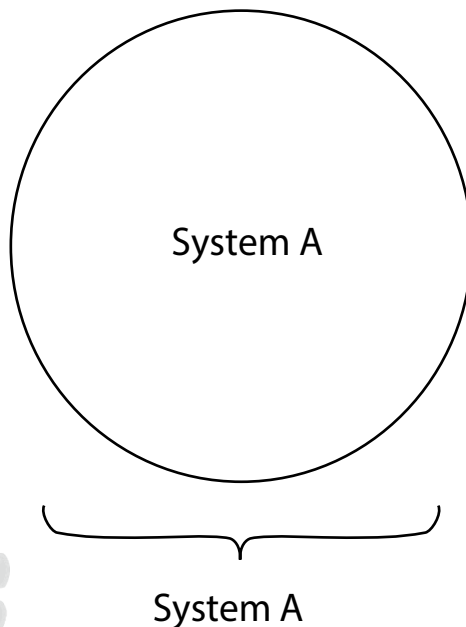
System A

System A

Does this solve anything? So we basically need a system that is able to come up with abstractions, in the best case all possible rules and structures should be capturable by these abstractions... let's see. Humans can do that to quite some extent, right? Look at mathematicians, artists, authors – really anyone! There's such a mind-boggling amount of complexity out there in the real world and also the parts that we shape, we have to be able to come up with quite the large amount of rules and patterns, encodings and decodings, to communicate all these structures. Language alone requires us to do that, already. Even if our abstractions are sometimes really only vaguely corresponding to reality.
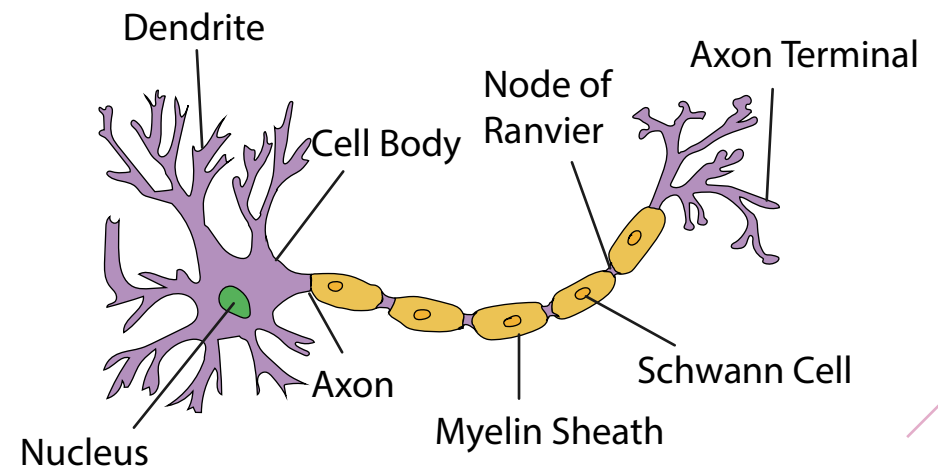
So our brains must be doing something really well to come up with this many abstractions and notice their isomorphisms to the real world. How? At their pattern recognition capabilities, some of you must want to shout NEURAL NETWORKS. To some extent, these are certainly part of our machinery [3]. But how about manipulating and making the abstractions on the "abstractified" side? And in particular, any type of abstraction? Let me say that Graph Theory seems really promising (something from pure mathematics: basically studying networks of nodes and edges).
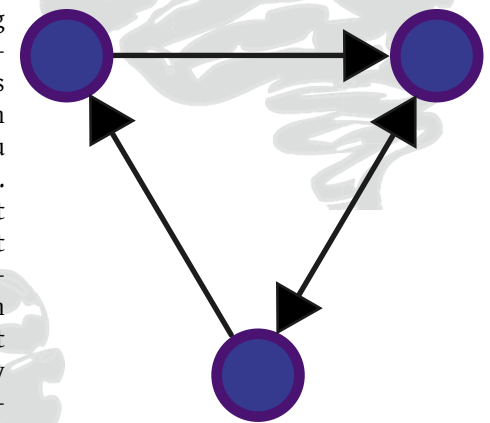
Especially looking at the ridiculously large graphs in our heads, made by neurons and their dendrites and axons. There is already a new type of AI based on these graph networks. [4]

But this is really where I should stop. In summary, I think that consciousness is caused by our self-awareness. Even though this leaves out a whole lot of what makes us human, such as decisions, emotions, friendship and love, it seems like a nice first step towards the mystery of consciousness. If you're willing to believe that System A would be conscious.

[1]https://en.wikipedia.org/wiki/Consciousness
[2] Gödel, Escher, Bach (1979), Douglas R. Hofstadter
[3]jttps://becominghuman.ai/neural-networks-relation-to-human-brain-and-cognition-b45575359f64
[4] Deep Learning on Graphs: http://geometricdeeplearning.com/

Dendrite

Cell Body

Node of Ranvier

Axon Terminal

Axon

Schwann Cell

Myelin Sheath

Nucleus

Effects of Music

Ruben van Asselt
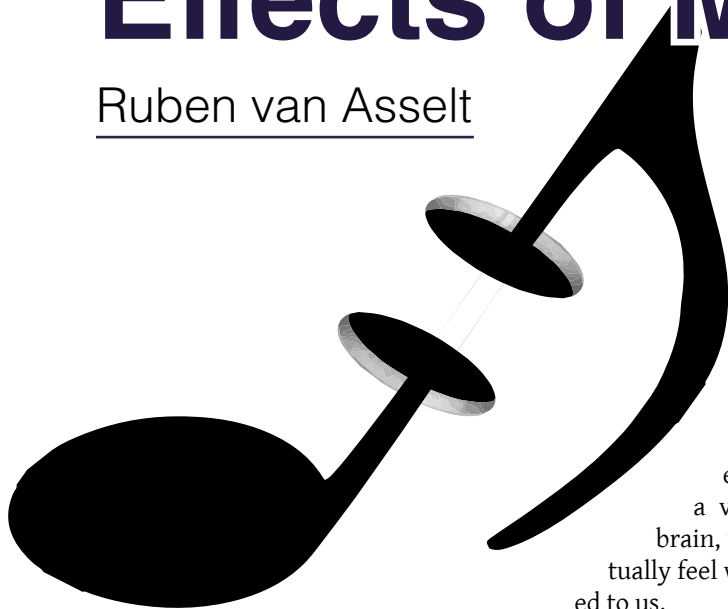
a dreamy rhythm with occasional upbeats can be a sign of love or joy. Tones are just as important as rhythm. A "major key" music piece will usually signal cheerful communication to our brain, while "minor key" pieces are sadder. This all has a very strong effect on our brain, which makes our mind actually feel what is being communicated to us.

Whenever you enter the Astatine members room there is some kind of music playing. The type of music can be selected by anyone who is a member of Astatine and has access to the remote. However because anyone can enlist his/her music there are many different genres of music playing throughout the day. Exactly this gave me the inspiration to write this article. I wanted to figure out why people like different genres of music and how these genres correspond to the mentality of the person listening to it.

Music can affect your mood in many ways. This is because of the rhythm and tone that we hear when we listen to music. When we listen to a rhythm, our heart actually begins to synch with it. A slow heartbeat with a strong diastolic pressure tells our brain that something sad or depressing is occurring. Very fast beating has to do with excitement, while

When we listen to joyful, happy music, our brains usually produce chemicals such as serotonin and dopamine, which make us feel happy. The same happens when we listen to relaxing, soothing music or too hard, loud, angry music, which can also cause a number of different emotional feelings. Music may cause you to feel joyful, sad, angry, hyped up, relaxed etc. and sometimes you can feel more than one emotion during a song.

Happy/sad music affects how we see neutral faces

When listening to music, most of us should be able to distinguish whether a piece of music is sad or happy. Research found out that when participants listened to music they interpreted neutral faces as a match to the type of music they listened to.

Further research into this effect found out that there are two kinds of emotions related to music. Depending on each person, you can listen to music and have perceived or felt emotions. This means that when you relate to the music with felt emotions, your emotion changes according to that type of music. With perceived emotions you merely understand the emotion of the song, but are not affected by it in an emotional manner. Thus you can enjoy listening to sad music rather than starting to feel depressed when listening to it.

Ambient noise can improve creativity

Music has an effect on the activity in your brain. This could either be positive or negative, depending on the type of music you listen to. Moderate noise levels are the best to encourage the creativity of the brain. This is also something that low noise levels do, however creativity is better stimulated with a moderate noise level. Moderate noise levels increase the processing difficulty of the brain. This stimulates creativity because when your brain finds it difficult to find a solution to an answer, it tends to look for more creative solutions. So actually with moderate noise levels you are making things harder on yourself than they actually are...

When you are listening to high noise levels you negatively affect creativity. High noise levels make it difficult to process any information efficiently. This way you do not understand the problem or understand where to look for a solution.
This is very similar to how temperature and lighting can affect our productivity, where paradoxically a slightly more crowded place can be beneficial.

Our music choices can predict our personality

This one has been tested purely experimentally and not on a very large sample size. But participants were asked to get to know each other by looking at the best ten songs of one another. Afterwards without meeting them they were given a sheet with 5 personality traits. Depending on the top ten favourite songs they had to estimate what personality traits would apply to the one the list was from. Anyhow, it provided a list with genres of music and the personality traits that were often connected:

- **Blues** High self-esteem, creative, outgoing, gentle and at ease.
- **Jazz** High self-esteem, creative, outgoing and at ease.
- **Classical music** High self-esteem, are creative, introvert and at ease.
- **Rap** High self-esteem and are outgoing.
- **Opera** High self-esteem, are creative and gentle.
- **Country** Hardworking and outgoing.
- **Reggae** High self-esteem, are creative, not hardworking, outgoing, gentle and at ease.
- **Dance** Creative and outgoing but not gentle.
- **Indie** Low self-esteem, creative, not hard working, and not gentle.
- **Bollywood** Creative and outgoing.

- **Rock/heavy metal** Low self-esteem, creative, not hard-working, not outgoing, gentle, and at ease.
- **Chart pop** High self-esteem, are hardworking, outgoing and gentle, not creative and not at ease.
- **Soul** High self-esteem, creative, outgoing, gentle, and at ease.

Music can significantly distract us while driving

Results of a study done on teenagers and young adults, which focused on how their driving is affected by music found out that music distracts from driving safely. During this study drivers were tested on their skills while listening to their own choice of music, silence or experimentally determined 'safe' music.

Results showed that while participants liked listening to their own music, they also made a lot more mistakes and were classified as driving aggressively.
On the contrary, music provided by the researchers proved to be more beneficial than no music at all. It seems that unfamiliar, or uninteresting, music is best for safe driving.

Music helps us exercise

Research on the effects of music during exercise has been done for years. Apparently listening to music can draw out our brain's cries of fatigue. As our body realizes we are tired and wants to stop exercising, it sends signals to the brain to stop for a break. Listening to music competes for our brain's attention, and can help
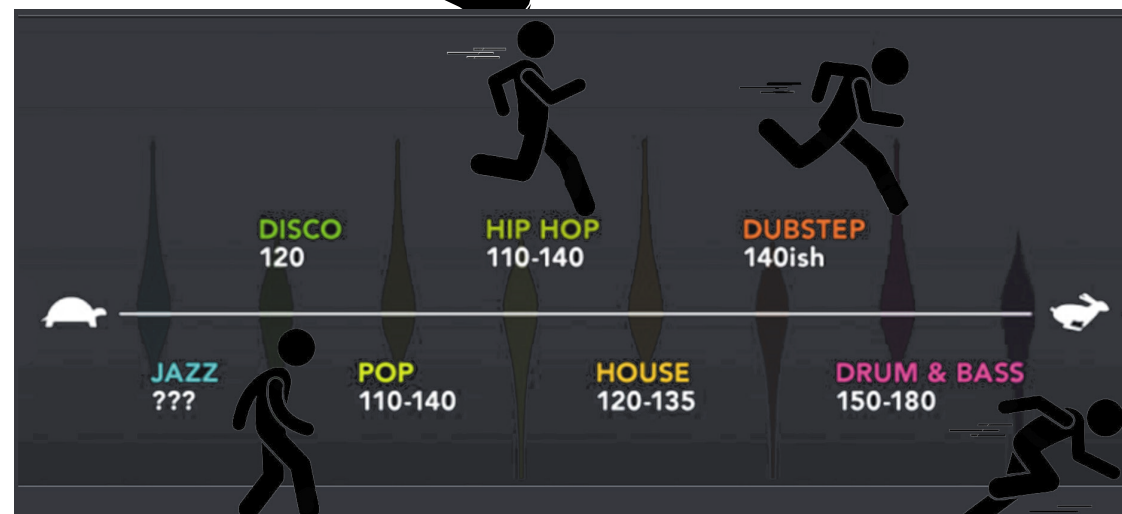
us to override those signals of fatigue, though this is mostly beneficial for low- and moderate-intensity exercise. During high-intensity exercise, music is not as powerful at pulling our brain's attention away from the pain of the workout. Some recent research has shown that there's a ceiling effect on music at around 145 bpm, where anything higher does not seem to add much motivation, so keep that in mind when choosing your workout playlist. The graph shows how this breaks down for different genres.

The tempo of the music can also affect the memory capacity of the brain. Music with a 60 beats per minute beat pattern, activates the left and right brain. The left and right brain actions working together maximises the ability to learn and remember information.

Now if we team up these different "tempos" with the actual work-out we are doing, we can be in much better sync and find the right beat for our exercise. If you match up the above with the graphic below it should be super easy to get into a good groove.

DISCO
120

HIP HOP
110-140

DUBSTEP
140ish

JAZZ
???

POP
110-140

HOUSE
120-135

DRUM & BASS
150-180

Churches

Alina von dem Bussche

If you go looking for European buildings that have been around for a thousand or even just five hundred years, it is likely that a significant portion of what you will find consists of churches. Old churches are more than just places for religious worship or convenient landmarks when travelling through a busy city. They are monuments of art and history that have countless stories to tell. Back in medieval times churches and cathedrals were often the largest and most elaborate buildings in a town or city and many of the great cathedrals from those times still stand out in modern cityscapes.

Medieval European churches can be divided roughly into two very different styles of building – Romanesque and gothic – even though there are plenty that contain elements of both styles (or even more). Since building one of these cathedrals could easily take a century or three, everything from the masons and builders, the people deciding (and paying), the available engineering knowledge, the current architectural fashion, and the mentalities concerning the significance and purpose of church buildings had plenty of time to shift and change. Add to that that repairs, renovation, and alterations could also take place after the initial construction is completed and it seems very understandable that cathedrals containing a patchwork of styles from different times are not exactly uncommon. Of course, there have been many different styles in art and architecture throughout human history, but for the sake of making this a somewhat coherent article two historic styles were chosen that are neighbors on the timeline of history. Even though they can sometimes both be present in different parts of the same building, the Romanesque style of the early medieval times and the gothic style of the later middle ages are rather different.

The Romanesque basilica is somewhat reminiscent of a castle. It typically looks like it is put together from clear and simple geometric shapes – reminiscent of building blocks that one might give a child to play with. A notable feature that shows up all over a Romanesque basilica is the round arch. Round arches can not only be found in passageways, windows and vaults but also in the decorations placed in and around the church. The vaults built whenever one intended to place a stone structure overhead (as a roof/ceiling) reflected the popularity of the round arch shape. Romanesque vaults were pretty much all barrel vaults (shape of the upper half of a horizontal hollow cylinder) or groin vaults (what you get when two barrel vaults intersect each other). What is important to note here from an engineering perspective is that with these types of vaults the entire structure is used to carry weight, so you had to make the whole vault with heavy, sturdy stone bricks. Now, as you can probably imagine, if you want something heavy to stay high up you need to build a sturdy structure underneath it to provide support. The solution to that were thick, heavy stone walls with only few, small windows in them. Making the windows too big would mean taking away too much 'wall space', taking away the strength the wall needs to carry weight and support the upper parts of the building. This approach to building engineering has a direct effect on the way the building is perceived and the atmosphere inside it.

The Romanesque basilica is a fortress of worship with thick walls that shut out the world. It can stand against any attack from worldly sources and serve as a refuge. The interior is not particularly well lit, candles and torches are a used as a source of light.
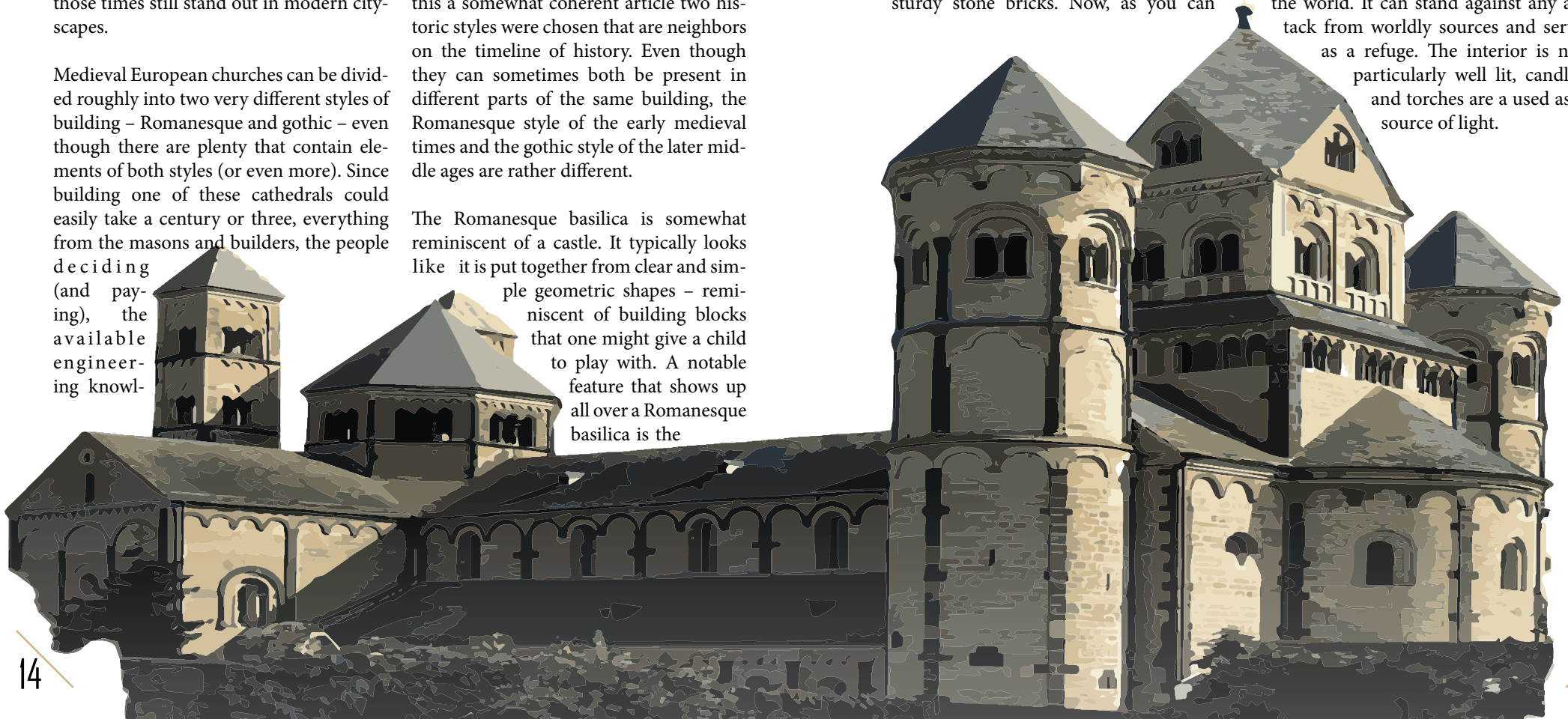
The gothic cathedral is based on a completely different take on what a church should express in its architecture. The idea of the gothic cathedral started in the 12th century and lets light take on a key role. Inside a gothic cathedral one can experience a spectacle of light. Sunlight streaming in through large, carefully crafted stained glass windows creates an ethereal, other-worldly experience inside the cathedral that is often interpreted to represents a connection to the transcendental tethered to the mortal plane through the cathedral and the belief it embodies.

From an engineering perspective, the gothic cathedral takes a drastically different approach to building structure compared to the romanesque basilica. The gothic cathedral is constructed based on the idea of constructing a 'skeleton' that defines the shape of the building and then filling in the area between the 'bones' with lighter materials. Ceilings are no longer constructed with barrel vaults but instead composed of ribbed vaults that are significantly lighter and therefore require less weight to be carried by the walls. This new approach to construction made it possible to both construct even taller structures and to fill a large portion of the 'wall space' with windows. Gothic architecture replaces the Romanesque rounded arch with a pointed one, for both aesthetic and structural purposes. A

rather interesting building element that can easily be identified in gothic cathedrals is the "flying buttress". Stone arches connect walls to piers (stone pillars) surrounding the main body of the cathedral. These arches are sloped downward from the walls and distribute part of the load of the main body to the piers around it. The piers are often constructed to be heavy and stable, topped off with heavily decorated pinnacles which contribute to their role as a visually pleasing support structure. This innovative (at its time) approach to supporting the weight of a building is a good example of the complete rethinking of building engineering that happened in the transition from Romanesque to gothic architecture. The massive, thick walls of Romanesque times are replaced by what can be described as stone 'bones' with significant amounts of air in the space between these bones.

Identifying characteristic features of the two building styles introduced here can not only give you an indication of the age of a church but it is also a way to see how engineering knowledge can be used to influence the perception of a structure and create a monument to an interpretation of what it means to be a mortal being in this world. Rethinking the design of a structure can be a way for thoughts and ideas to be expressed and to influence people even centuries after the original engineers have passed away.

Groeten uit...

Zwitserland 2009

Vietnam

Rio de Janeiro 2008

Maleisië '10

Dubai 2007

Met het Universiteitsfonds Twente komen ze verder.

Word nu donateur!

UF Stichting Universiteitsfonds Twente

Ugly Sweater Day

13th of December marked the ugly sweater day at Astatine. Marly was wearing the ugliest sweater of the board, namely none. Tom was 100% christmas dude, whereas Ward just wore one with himself on it. Most members seemed to have forgotten about it, but at least the board was looking at their most dapper.

Sportco Pooling

The SportCo arranged a sweet Pooling place, the Snooker & Pool Centre Enschede. We had 4 tables to hit balls, especially hit it from the back style. Anyhow, we were just pooling and switching the teams around while sharing a lot of fun and laughs.

Laughter Yoga

Hahahaha hihihihi hahahahah ha hihi hahhahahahha. Good summary right? Nah, it was really fun, awkward at first, but after a while you just get into the flow of things. We walked around in stylish ways, very exhausting. Also, making laughter smoothies is great! The whole of the 7th floor could hear us, which is good I suppose.

Did you know?

Every year, the earths rotations take about 14 microseconds longer. This is known as tidal breaking, and in 4 million years will cause a day to be 56 seconds longer. This means a year is now exactly 365 days, making leap days obsolete. This also means that every 4 years you have a day less to procrastinate your studies.

Boss New Years Bingo

There was a lot of beer. I really mean a lot of beer, like a lot. Dave and Dorinde provided some good entertainment to start the Bingo off. There were amazing prizes, like a lot of amazing prizes. They were pitchers. Like a lot. Filled with beer. Oh, and Noud did a speeeeeeeeeeeeeedrun of bingo. Action style! Yeah, didn't expect Bingo to be so much fun but apparently it is possible. Good for you grandma.

Sinterklaas

Every year the "goedheiligman" visits Astatiny, portrayed by Herbert this year. A Sinterklaas pubquiz and presents given away by him set the tone. The cursus "how to be Piet", consisting of throwing presents (ping pong balls) into chimneys (beer cups) surprisingly escalated into rounds of stress pong. Lets just hope Sinterklaas (Herbert) made it home.
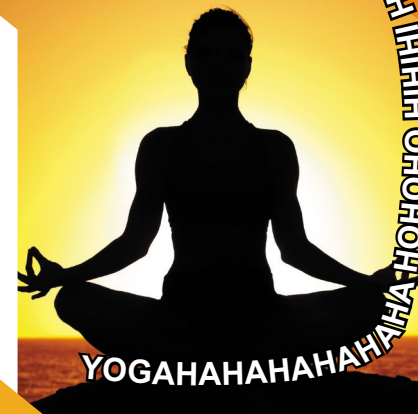
Urban Planning

Sander de Ridder

A while (like, 10.000 years) ago, some bloke decided to plant some weeds. Now, with the birth of agriculture, humanity could prosper for the first time. A while later, some different bloke tamed some lawnmowers. Now, humanity could use the word cattle. And like the cattle they were, they started flocking together. Some blokes decided they were too good for farming and started to provide other services. Slowly, the first cities started to emerge. To aid in the prosperity, these cities were often laid out in a grid like structure. Cities inhabited by the ancient Indus Valley Civilization (that's 4500 years ago) show signs of deliberate planning and management of settlements. The aerial image of Ur, a city estimated to be founded in 3800 BC, shows signs of these grid like structures.

Ancient Greece already planned out their cities, and in true Roman fashion, the Romans stole this idea and did the same. In a lot of the cities they both founded the grid like structure and insulas -city blocks- can still be seen. The Murerplan shows the Swiss city of Zürich in 1576, and the top half still moderately resembled the grid. The Norwegian capital of Oslo, in comparison, was founded in 1040 and lies outside of the ancient Roman borders. Even today, the city plan is still rather chaotic.

Of course, humans are rather shitty beings, so those blokes in the city realised they needed to keep out those up-to-no-good blokes from outside the city. This led to cities being walled off even though they kept growing. Organic growth of cities is a lot harder to manage, especially when houses are built just outside of the city. This did come with an advantage. When invading a city like Oslo old-school-style, an army on foot will come across multiple bottlenecks while charging for the centre. For a grid-like city, this would be more of a casual stroll. The other option would be walling of your entire country in case you have a Mongol infestation. Old Chinese cities show that in ancient China, the planning of cities was often done too.

Despite the advantages of chaos, not all city planning was thrown away, although the Roman influences certainly dwindled. Large streets and promenades were still important for the economics of a city. However the grids disappeared. Medieval London is a great example of this. The old part by the Thames has obvious blocks, whereas when you go up to the outer rings, roads become more curvy. That should keep out those stupid Franks.

Moving out of the dark ages, city defence became a little less necessary, and as the industrial revolution began, urban planning could be considered a necessity to keep a city important. Paris was entirely revamped in 1852, demolishing old medieval quarters in favour of wider streets, amongst others. This facilitated troop movement, in case those pesky citizens decided they wanted another revolution. Luckily this sin did not go unpunished, and the city plan of Paris is still a horrible mess. Barcelona on the other hand decided to keep the medieval district. Due to industrialisation, however, the city could not stay within these very tight limits. Sickness festered there, air quality was low and life was just not very enjoyable. The medieval city walls were torn down, and Eixample district was build outside it. And *oh my god* does it satisfy my OCD.

Ildefons Cerdà, the guy who made the plans for the new Barcelona, coined the term urbanisation. Now as may have been mentioned in the introduction, urban planning was not at all new at that time. A lot of cities in the colonies (ergo the USA) had been planned in the grid like fashion. But this has all been done before the rapid changes that led what is now the modern world. Cerdá was one of the first to take vehicles into consideration, like cars and trains. All blocks have diagonal corners, to give drivers a better overview of crossing points. Gas supply and good and effective waste treatment were key components, just like the green areas and the lighting he took into account. The congestion in the old city had become a major concern, but his plans found solutions for the problems here. Not all his ideas were realised, the streets are narrower and there is less green space than he had envisioned. But the district is still considered a pioneering design.

The study of Urban Planning has been practiced for a long time, thus. So of course people have taken the ideas to whole new levels, with entire cities being pre-planned and built. This happened during the industrial revolution, when factories had to have their labourers live close by. There have also been countries that decided to move their entire capital somewhere else. Somewhere new. Brazil built Brasilia in the middle of nowhere, as did Kazakhstan. What one often hears however is that these cities remain rather vacant. The expected mass immigration does not quite happen. Huge streets only see a few cars a day, giant monuments just seem forced and within a few years buildings start to decay. More often than not, stories pre-planned cities sound like
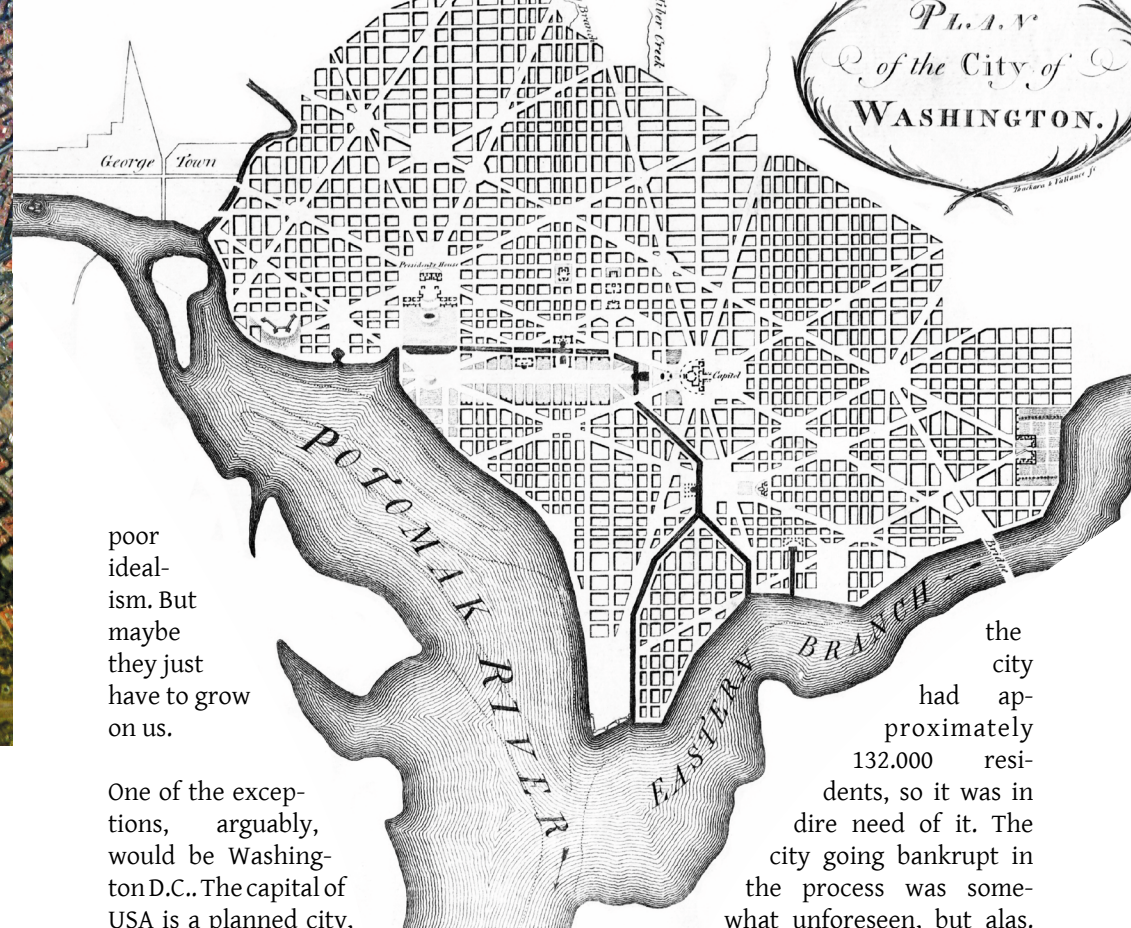
poor ideal-ism. But maybe they just have to grow on us.

One of the exceptions, arguably, would be Washington D.C.. The capital of USA is a planned city, but was founded around 1790. Then president George Washington selected some land on the banks of the Potomac river, assigning a French engineer who was not on strike to plan the seat of the government for the fledgling nation. Pierre Charles L'enfant eventually had a falling out with the commissioners overseeing the plan, since he did not want to have it changed. After Washington dismissed him (basically a forced strike), one of the commissioners completed the plan. In 1800 the government moved to the city. For it to get hard roads and decent sewage management, however, took until 1870, making one doubtful of the amount of planning that went into it. By this time the city had approximately 132.000 residents, so it was in dire need of it. The city going bankrupt in the process was somewhat unforeseen, but alas. By 1900, the city still qualified as a failed capital, with many slums. As first city in the US it went through an urban renewal project as part of the "City Beautiful movement", a philosophy for North American Architecture that sprouted from the world's fair in Chicago a decade prior. As new government buildings were added and the second world war saw an increased activity in them, the population grew to 800.000. With few buildings being vacant and the city boasting a working populace, one can argue the new capital finally succeeded.

Brasilia is more or less the opposite story. The Brazilian government wanted a

more centralised capital. Due to Rio de Janeiro being the capital up until then, the country was kind of centred around the Atlantic Coast. The plan to move the capital had been around for a while, but was not finalised until 1960. The shape of the city is often compared to that of an aeroplane. Maybe because it is a metaphor for how the citizens just ate it, just like how your parents forced fed you food disguised as an airplane. But maybe it is just because it made for an easier division north-south and east-west, ultimately making for better building blocks. Although the government planned for a slow population growth, it actually grew more rapidly. Nowadays the city has over two million residents, although that heavily depends on which boundaries are used for the city, and which for the federal district. Initially it was planned for half a million. Taking the same argument as DC, one would say the city has not failed. However, the problem is in its success. Less fortunate people are forced to live in close by satellite cities. The city was planned for governmental work, with a focus on cars. It misses the charm of old European cities with their cramped streets, or the diversity of older new-world cities. But it is only 60 years old, and is doing better than Washington at that time.

Okay so some bloke may have turned this article into a history lesson. But in turn, these examples give some great insight into the challenges urban planners have faced throughout -well- millennia. From walling in your residents to protect them, to making chaotic layouts to annoy attackers. Yet in more modern times, opening cities to improve trade and transport, reducing overly crowded areas to improve quality of life. Planning entire cities and the challenges faced during. The rise of cars, their damnation. Nowadays, new challenges are rising. Dealing with mass-tourism, rapidly increasing rents making the city unliveable for those on a small salary, and dealing with those pesky engineers wanting to implement new things. As long as god does not get his hands in Cities: Skylines, these blokes probably have a guaranteed job.

Sources:
• It's all wikipedia bro

Images (in order of appearance):
• A photograph of Ur from the air. - History and monuments of Ur, by C. J. Gadd
• View of the city of Zürich on a xylography by Josua Murer, 1576 - Documentation about the Murerplan, Mathieu Verlag Zürich, 1997
• Barcelona from the Air 03 - GIOVANNI PACCALONI
• Plan of the City of Washington, March 1792, Engraving on paper - Library of Congress
• Vista parcial do Distrito Federal - NASA

Astatine Dies

Tom Veldman

Our lovely association became 14 years of age on December 23, 2019. This festive happening was gleefully celebrated on December 19, four days earlier. As per usual, the board arranged for a wonderful meal for all those attending which consisted of three fancy, though perhaps unsavory colored, courses. The dinner, which took place in a cozily-decorated TAP, started off with a gazpacho, followed by some spicy curry and as dessert a lovely mousse was served.

After this ever-so-lovely dinner, the 15th board was happy to announce they would donate a keg to her members, which was gratefully received by everyone. The golden river flowed in great abundance, and many a toast was cheered. The traditional competition of beer relays quickly ensued and the ground was soon covered in the heavenly nectar.

With the celebration being themed by Formal Beachwear, there were quite a variety of suits. This ranged from simple flowery shirts to airy dresses and three-piece suits with swimming trunks underneath. Those who took it a step further even brought headgear and accessories, the sight of which was quite enjoyed by everyone.

Once the beer relay tournament had passed and the keg was emptied, the remainder of the evening was quickly filled in by other impromptu activities. There wasn't a dull moment to be had and the end of the evening soon approached. The TAP was then swiftly cleaned up, with the help of some very assistive members, and we could party on elsewhere for the rest of the night.

∫Math · Puns

Yannik Wotte

Are you all set for your next exam? Do even unsuspecting sentences begin to have unsettling elements of math? Do you feel {}? Are you baysesically unprepared and your chances uncertain, or did you brace yourself for an indefinite integral over 1 with respect to d(success)?

We all know it: If you don't study you phase defeat in the more complex exercises and calculose the exam. Lack of preparation makes you curl around the real meaning of the exercises, and last-minute cramming has an infinitesimal effect on your grade. You need to invest more than just a fraction of your time and differentiate between your priorities.

This is of course easiest if you feel Hooke'd by the topic, that way you can learn new tons of material without bother. But what if you are fourierious that the lectures don't appear to be la place for you? You need to find your own flow of studying, even if a lot of effort is coupled to that: success is always a product of flow and effort (but does not necessarily have units of power).

There are many options for studying: make a very neat summary, read the book, look at your way of solving the tutorial questions, dirac-tly apply the gained knowledge in your own projects or go for a practice-exam. If you feel shocked by the current exercises, doubt your potential and feel inclined to conduct the crime of cheating at the exam? Resist the urge, I believe in your capacity.
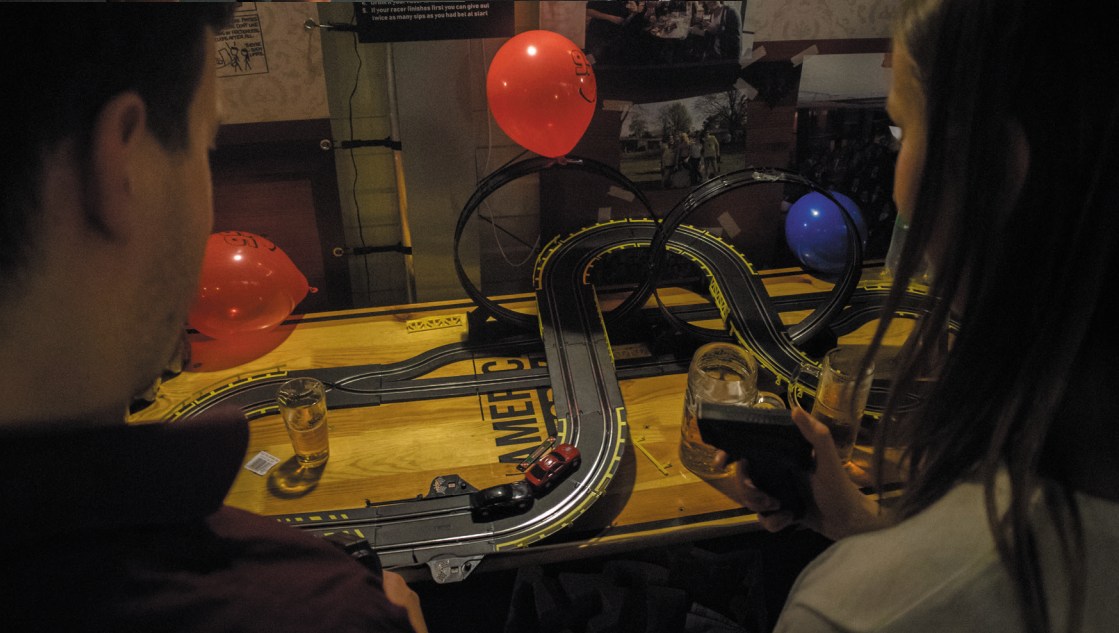
Just don't diverge from the topic. Studying is an integral part of understanding the math and makes quite the difference. Are you on another tangent than you should be on, then ask yourself: how long has it been sinc you took a nap?

As my last words of advice: Maybe you'd want to take a break Far a day before the exam, to calm your mind.

$$\frac{\sin x}{n} =$$

$$\frac{\sin\!\!\!/ x}{\not n} =$$

$$six = 6$$

Curious Stuff

Alvaro Aguirre Fontenla

Chapter 1

Every day has its own schedule, different courses or work to do. Although it seems a bit different from day to day, your routine is always the same: waking up, brushing your teeth, having breakfast and looking out the window to see how dark, cold and wet the weather is. Not much to say, the Sun in here is a privilege not many people can afford.

Far enough from that conspicuous routine, stuff gets into your head while being in class. Every now and then, a small reminder of Miley Cyrus singing "Wrecking Ball" or just going through the weirdest stuff ever; physics....

Starting with a paper in blank, no notes, and a small feeling of hunger which reminds of the groceries you forgot to do yesterday, you see through that and begin to wonder how the ink really stays on paper and how it comes that pencil can be erased and ink can't... A short beginning for something so simple as that.

A new approach; pressure, diffusion, wettability, capillarity? They may all seem fine and correct as they all take a small part in such discussion. And even though it seems simple, there's a science junction between paper and ink. Not only in the simple way of one being able to be printed on the other, but in the physical properties of both materials to be useful in such a way and keeping those notes for a long time.

On the other hand, carbon-based structures deposited onto this surface won't attach in the same way as ink does. Graphite just delaminates and joins onto the surface, the small friction between both layers is sufficient to create bonds with enough strength to support it in the long term. Bad news to this situation is the structure and mobility of the layers deposited on top of the one which is connected to the surface. These last ones tend to slide along and attach or fly away from the surface, causing the initial state to slowly disappear. On the other hand, by doing so, we develop a new characteristic in the notes written down. They become more and more conductive, until we have superconductive notes; (not really, but it would be cool to create high efficiency circuits in paper for one use only....... Harry Potter dreams).

Erasers... well you can guess how those work: friction, abrasion, attachment, and chemistry to detach from the main base.

Chapter 2

Ever got splashed by a car or bike...? Well too bad, "shit happens". The creation of a temporarily motionless wave on the sides of the wheels - well, at least motionless from the drivers view. From your point of view it's just splash! No time to think just watching your life passing through slides and wondering what would have happened if you had prepared that sandwich before going out. That funny situation is not only created to ruin your day, but to save the driver's one. Channels made in the tires to control the caudal of water that can be shot out without having to lose control of the car or bike.

It is just enough to say that the characteristics of such a device are measured for specific loads of specific weight that are going to be carried by it. The width of the tire with respect to the channels and their thickness. The maximum caudal that can be canalized is measured for these situations.

Wonder what! The thermofluidics course is actually useful.

Full Road Contact | **Moderate Speed** — **Reduced Road Contact** | **High Speed** — **Hydroplane**
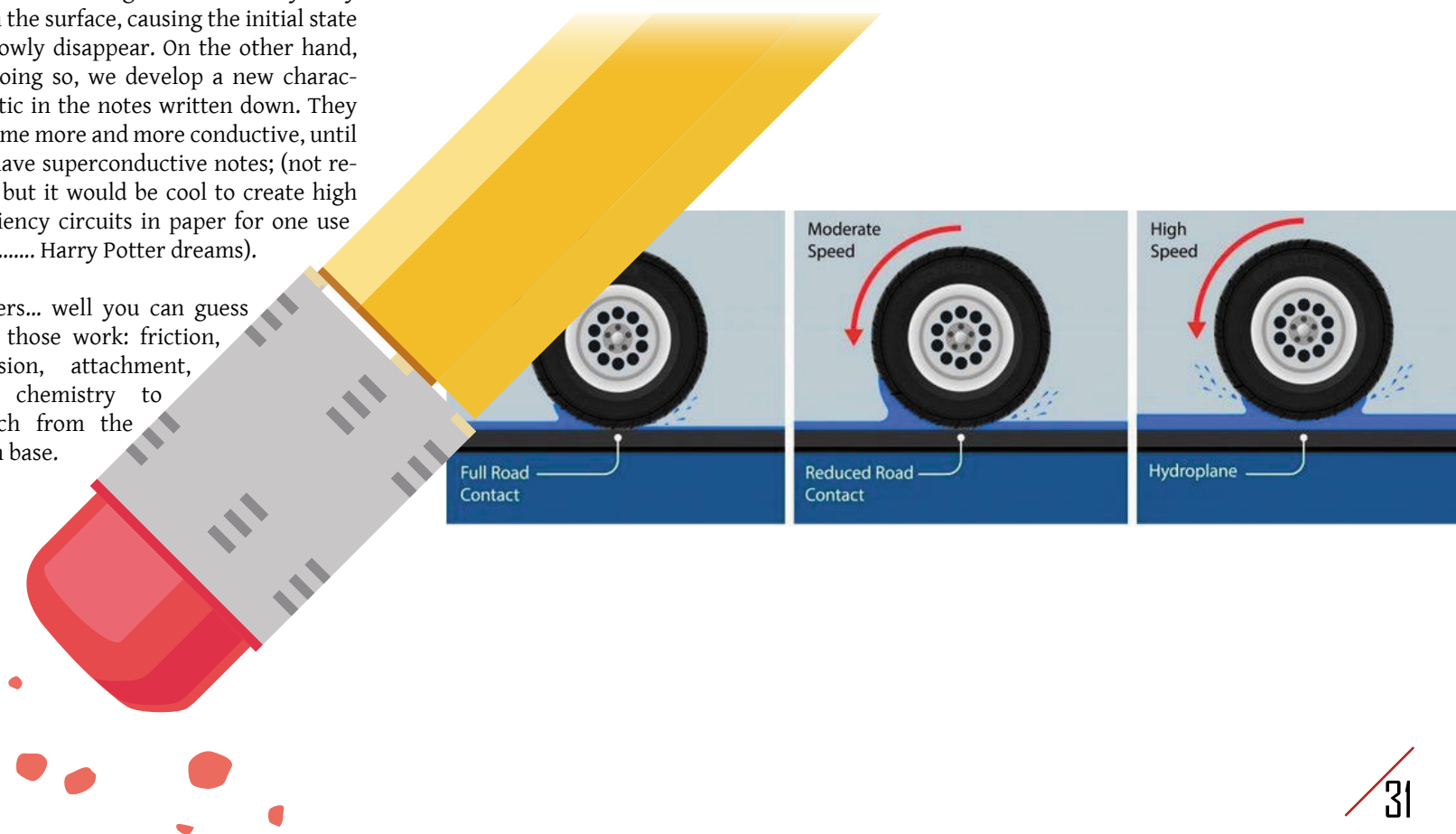
Chapter 3

Starting with the vision of fish under water... it's quite a perspective they have. Not being able to see the element they are in, just as we also don't, if you think about it. So, if we don't see air then, what do we perceive instead?

We are able to see objects, differences in elements if the sizes and density differences are big enough.

Light plays a main role in this transit. Many physical behaviors act for this characteristic. One of them, and for our point of view, reflection. Others; refraction, scattering...

All of them play different roles in terms of visual caption. For example, we can not see the air from our point of view, but if we dive in water we do; or do we? So, what exactly do we see?

We perceive the changes from one environment to another. Meaning that if there is no change, we would only see a continuum. We must have a first reference to see what we want. One example is the craik-o'brien-cornsweet effect which causes us to create two different shades by making a contrast layer in the middle of an object.

Step change:

Craik O'Brian contour: The greys on either side actually the same shade

Inverse Lighting:

If we apply this situation to our routine, the system gets more complicated. We don't see in black and white, but we perceive colors too. The images collected represent the same principle shown before. Our vision is based on references and previous knowledge of the things we have already seen. Meaning that we reconstruct our surroundings, adapting it to the things we already know, and the logic that we have gained during our life. Another example is shown with shades. Light in its natural form comes from the top (the Sun). If a picture or representation shows the opposite, we will transform the image to the things we were once taught. This creates the illusion of depth in certain shapes.
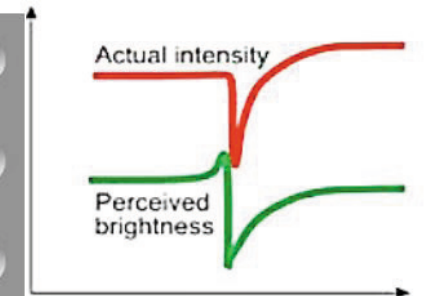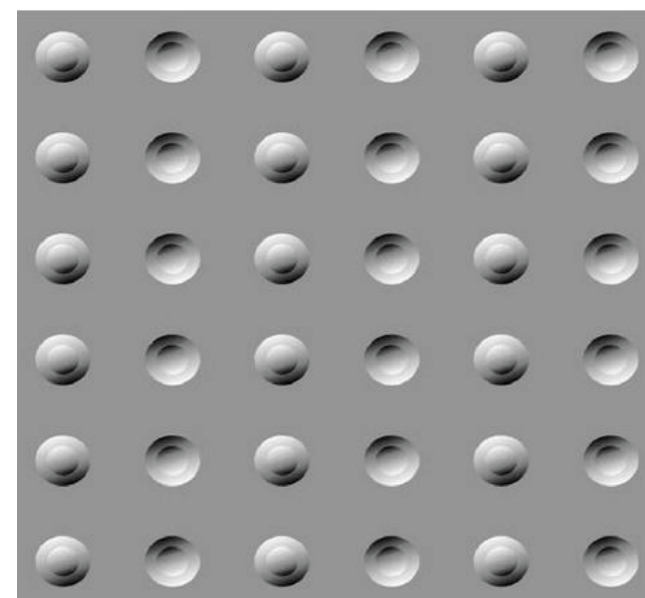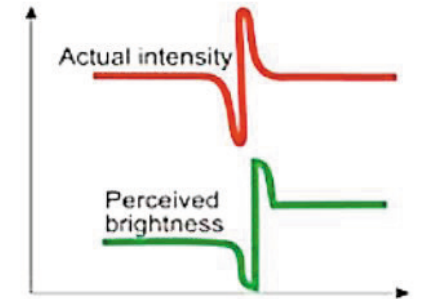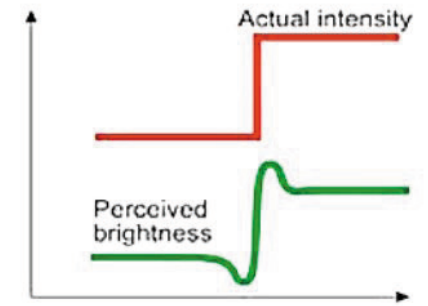
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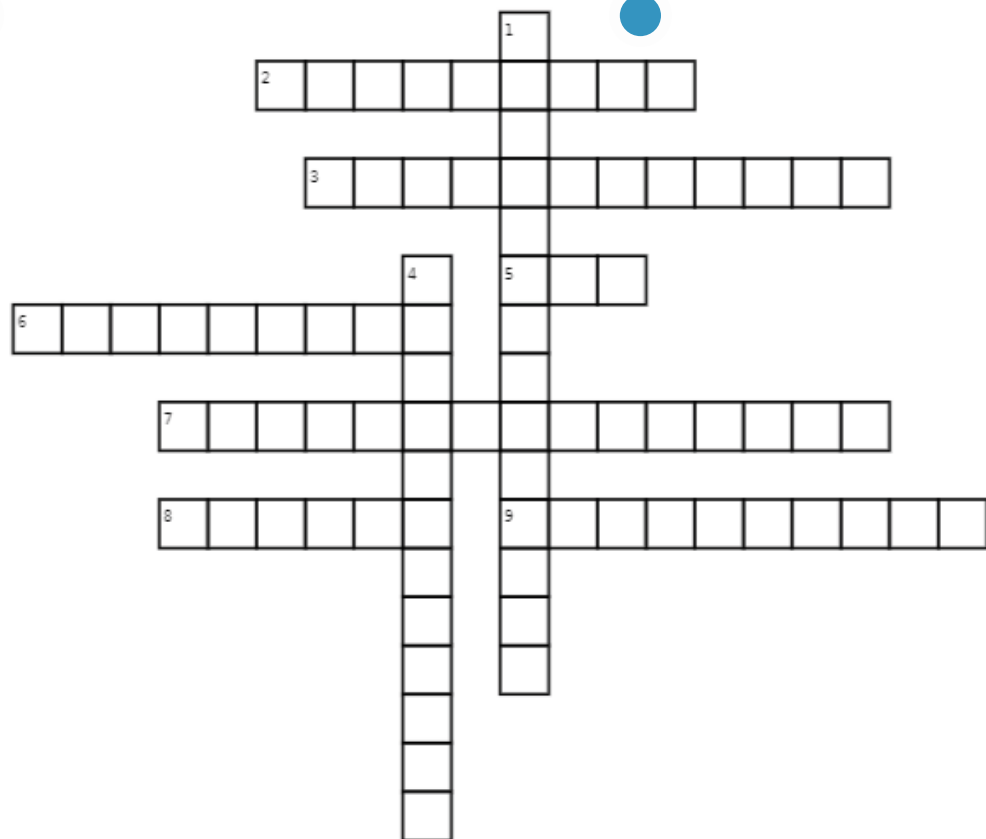
Down:
1. Architectural element of gothic building style
4. Term coined by Ildefons Cerda

Across:
2. Shape of the city Brasilia
3. Being aware of internal and external processes
5. General Members Assembly
6. Theme of the Dies: Formal [...]
7. The act of postponement
8. graduated student of an university
9. Medieval European building style

Cheerful Chef — Apple Crumble

Roos de Vries

I have this problem where when I host a party, all I do is worry about my guests. Are they comfortable? Are they enjoying the food? Is everything perfect? I obsess over the details and micromanage, and it keeps me from enjoying the party myself. That's why I'm always looking for simple recipes that I know will please a crowd, and that take up as little mental space as possible.

Apple Crumble is one of my favorite desserts for such a situation. It's the ultimate crowd pleaser: sweet, but also sort of healthy. It looks fancy, but is (very importantly!) super easy to prep. The joys of apple pie, without the hassle.

Here's how you do it.

For 8 Servings:
- 8 apples
- 1 lemon
- 1,5 teaspoons of cinnamon
- 6 tablespoons of brown sugar
- 50 grams of oats
- 50 grams flour
- 100 grams of butter
- One oven and a large oven dish.
- If you're feeling fancy: raisins, nuts and ice cream

How to do it

1. Cut eight apples into cubes. Dress with lemon (for freshness), 1 teaspoon of cinnamon and 2 tablespoons of brown sugar. You can add raisins if you like. Butter an oven dish and spread the mixture in it. Set aside.

2. Melt about 100 grams of butter. In a bowl, mix with oats, flour, a pinch of salt, the rest of the cinnamon, and the rest of the sugar. This should form a dry mixture of crumbs. You might need to adjust things to taste; sometimes I like to add some toasted pecans or walnuts in as well. Set aside.

Okay! That's all you need to do ahead of time. Now go enjoy your party until 15 minutes before dessert.

3. Preheat the oven to 180 degrees. Spread the crumble over the apples. Put in the oven for 15 minutes, or until the apples soften and the crumble caramelizes.

4. Serve plain, or with ice cream. Watch your guests marvel at your cool and calm demeanor.

See? Easy peasy!

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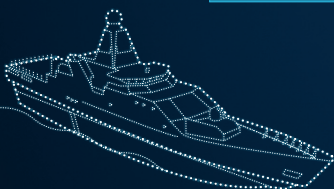## A WORLD OF
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