TIMES JOURNAL

HEVSEL TIMES

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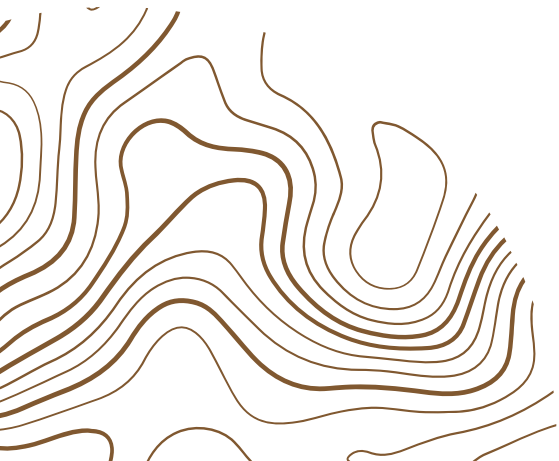

FOREWORD

As an online journal centered in Diyarbakir, Southeastern Anatolia, Hevsel Times caters to connecting to its community through spreading knowledge regarding both the culture and history of Southeastern Anatolia.

Hevsel Times was officially founded by Gul Karen Aca in 2021. However, the idea to create Hevsel Times goes back to 2018, when Diyarbakir Bahcesehir College Science and Technology High School was first founded. In this high school, an educational system centered around global values was provided. Upon becoming part of a global network of like-minded students, the idea to create a journal to raise awareness regarding different issues and Kurdish cultural values was planted.

The Hevsel Times Community eventually became a hub for students with different ideas and experiences. The community diversified and as a result, Hevsel Times maintained activity in several media networks and research areas.

After the founding members of the Hevsel Times got accepted by several prestigious universities such as Stanford and Columbia, the Hevsel Times Community built a system of an Advisory Board as a support system and sustained the ties between the newer and older classes. This fostered diversity in the Hevsel Times Community and marked the start of a new era for the journal.

Gul Karen Aca

Founder of
Hevsel Times

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WHAT IS HEVSEL TIMES

HEVSEL TIMES

Hevsel Times is an international journal publishing scholarly articles of interdisciplinary interest from high school students based on originality, clarity, relevance, and timeliness.

We recognize the equal representation of talent; therefore, we are committed to fostering diversity and inclusion in high school research culture with an article submission platform, podcasts, videos, an editorial advisory board, mentorship, and workshops. Hevsel Times believes in the transformational power of research and advocates driving positive change in the world with it.

With its wide array of content, Hevsel Times provides its readers with essential information in all fields of research, spanning from science to history. This way, Hevsel Times both connects to the international community and provides passionate writers with a supportive community of like-minded peers.

As a result of the diverse content and writer opportunities it sustains, Hevsel Times stands out among journals, stapling its name as the biggest high school journal in Southeastern Anatolia.

Additionally, with the Cosmopolitan Library, Hevsel Times promotes Kurdish history and cultural elements, spreading Kurdish traditions.

WHAT IS TIMES JOURNAL

Times journal is an academic publication established by Hevsel Times to give students a place to publish their academic work.

Times Journal releases a new volume every year that includes research papers and any other academic literature done by high school students throughout the year.

Times Journal offers a platform for students to contextualize their academic work with a variety of themes, ranging from science to philosophy, history to art.

Furthermore, the Times Journal serves as a way to learn more about the Hevsel Times Catalogue, which is diversified with each new publication.

Our readers and listeners can see our best works from this year, and also be provided with more information regarding the message they convey and who their writers are.

Finally, Times Journal also includes the carefully selected YouTube videos and Spotify podcasts of the year, sharing its content and providing its readers with access to the Hevsel Times Catalogue.

OUR MISSION

One of Hevsel Times' most important goals, Times Journal assists students by placing their research within a broader context, thereby enriching their academic journey and understanding.

PUT RESEARCH INTO CONTEXT

Times Journal offers students a space that they can use to publish their academic work and research they conducted.

PROVIDE AN ACADEMIC SPACE

Times Journal is a place where young researchers can connect with each other by publishing their work and reading other publications.

CONNECT YOUNG RESEARCHERS

OVERVIEW OF PAPERS

Examining Past and Current Anti-Trans Laws in California

The article "Examining Past and Current Anti-Trans Laws in California" delves into the historical context and contemporary issues surrounding transgender rights in the state. It explores indigenous cultures' acceptance, the impact of immigration on anti-trans legislation, and the ongoing struggle against discriminatory laws, highlighting both historical injustices and current advocacy efforts.

YIGIT EFE NAS

Fritz Haber, the Man who Killed Millions and Saved Billions

This article examines Fritz Haber, who revolutionized agriculture with the Haber-Bosch process, saving billions from starvation, but also pioneered chemical warfare in WWI, causing immense suffering. His legacy remains controversial due to his profound impact on both food production and wartime atrocities.

ARDIL ULUCAY

MODERN ART: What Am I Supposed To See?

The article contrasts Leonardo da Vinci's "Salvator Mundi," depicting Jesus in Renaissance dress as a symbol of salvation and cosmic mastery, with Kazimir Malevich's "Black Square," a Suprematist piece using geometric shapes to express deep existential themes. It discusses modern art's shift towards conceptuality, highlighting Marcel Duchamp's provocative works that challenge traditional art norms. Modern art's controversial nature and enduring cultural impact are also examined.

ARDA BORA KARAHAN

ADANUR NAS

Traffic Control Analysis: Roundabouts vs. Signalized Intersections

"Traffic Control Analysis: Roundabouts vs. Signalized Intersections" delves into the comparative effectiveness and economic implications of these two primary traffic management systems in urban environments. It explores trends in their adoption, operational efficiencies, and the economic costs associated with traffic congestion, providing insights into optimizing traffic control strategies for sustainable urban mobility.

JIR DARA AKCAN

Understanding the Great Depression: Lessons from Economic Turmoil

This article uncovers the profound impacts of the Great Depression, highlighting its causes such as the 1929 stock market crash, overproduction, and protectionist trade policies. It discusses the severe human toll, including widespread unemployment and poverty, and emphasizes the importance of government interventions like Roosevelt's New Deal.

AVJIN AKTOP

Women Rights in the USSR

The article "Women Rights in the USSR" provides a comprehensive historical examination of women's experiences and rights throughout the Soviet era, highlighting initial advancements in gender equality following the 1917 Revolution contrasted with subsequent setbacks under Stalin and beyond.

UNDERSTANDING THE GREAT DEPRESSION: LESSONS FROM ECONOMIC TURMOIL

Written by: JIR DARA AKCAN

The Great Depression was one of the most significant economic downturns in modern history, casting a shadow over the global landscape during the 1930s. Its impacts were profound and far-reaching, affecting millions of lives and reshaping societies and economies for years. Understanding the causes, effects, and responses to this era of turmoil not only offers valuable historical insights but also provides crucial lessons for navigating future economic challenges.

The roots of the Great Depression can be traced back to a complex interplay of factors. One key factor was the stock market crash of 1929, which triggered a cascade of financial panic and loss of confidence among investors. The widespread speculation and overextension of credit that preceded the crash exacerbated its impact, leading to a rapid decline in consumer spending and business investment. Moreover, structural weaknesses in the global economy, such as overproduction in the agriculture and manufacturing sectors, contributed to the crisis. The imbalance between supply and demand created deflationary pressures, further deepening the economic downturn. Additionally, protectionist trade policies, such as the Smoot-Hawley Tariff Act of 1930, worsened the situation by stifling international trade and exacerbating the economic contraction.

The Great Depression brought immense suffering to individuals and families across the world. Unemployment soared to unprecedented levels, reaching over 25% in the United States and causing widespread poverty and destitution. Families lost their homes, businesses collapsed, and millions were forced to rely on soup kitchens and government relief programs to survive. s.

The psychological impact of the Depression was equally devastating. Despair and hopelessness permeated communities, leading to a rise in mental health issues and social unrest. Discontent fueled by economic hardship manifested in protests, strikes, and political radicalization, posing significant challenges to established political systems and institution

In response to the crisis, governments implemented a range of policy interventions aimed at stabilizing the economy and providing relief to those affected. In the United States, President Franklin D. Roosevelt's New Deal initiatives introduced sweeping reforms and public works programs aimed at creating jobs, stimulating demand, and restoring confidence in the financial system. Similarly, other countries adopted measures such as monetary easing, fiscal stimulus, and social welfare programs to mitigate the impact of the Depression. These interventions helped alleviate some of the immediate suffering and laid the groundwork for economic recovery in the years that followed.

The Great Depression offers several valuable lessons for policymakers and economists today. First and foremost, it underscores the importance of proactive and coordinated policy responses during periods of economic crisis. Timely intervention through monetary and fiscal measures can help prevent a downward spiral of deflation and unemployment, cushioning the impact on vulnerable populations. Moreover, the Depression highlights the dangers of excessive speculation and leverage in financial markets. Regulatory oversight and measures to curb risky behavior can help prevent the buildup of systemic risks and reduce the likelihood of future crises. Additionally, economic downturns' social and human costs cannot be overstated. Investing in social safety nets, education, and healthcare can help build resilience and reduce the impact of economic shocks on individuals and communities.

While the Great Depression remains a harrowing chapter in history, its legacy serves as a reminder of the resilience of human societies and the capacity for recovery and renewal. By learning from the mistakes and successes of the past, we can better prepare for the economic challenges of the future and strive to build a more equitable and sustainable world. In conclusion, the Great Depression was a watershed moment in global history, leaving an indelible mark on the collective consciousness. Its causes were multifaceted, its consequences profound, and its lessons enduring. As we navigate the complexities of the modern economy, the experiences of the Depression era offer invaluable insights into the dynamics of economic crises and the importance of resilience, innovation, and solidarity in overcoming adversity.

FRITZ HABER, THE MAN WHO KILLED MILLIONS AND SAVED BILLIONS

Written by: ARDIL ULUCAY

Fritz Haber is a name less widely recognized and known than some of his counterparts such as Louis Pasteur, Tesla, or Marie Curie. Yet, his impact on the world was profound. He was probably the reason that many of us today are even alive. This controversial figure was born to a German-Jewish family on December 9, 1868, in what was then Breslau, Silesia, Prussia (It is now Wroclaw and is located in the borders of Poland) Haber received most of his early education in a Gymnasium (It is a type of school that mainly teaches science-related topics). He was most likely influenced and inspired by his father who was an importer of natural dyes and pigments. He started studying chemistry at the University of Berlin in 1886 but transferred to Heidelberg just after one semester. One year into university he had to interrupt his education for a year of mandatory military service.

Later, he attended Charlottenburg Technische Hochschule in Berlin, he collaborated with Karl Liebermann on studying the organic compound piperonal. Since Charlottenburg didn't offer doctoral degrees, he obtained his doctorate from the University of Berlin in 1891 for his research with Liebermann. Following graduation, he experienced three years of instability, marked by sporadic industrial jobs (including working for his father) and brief periods of postdoctoral research at Technische Hochschule in Zürich and the University of Jena [1].

In the late 19th and early 20th centuries, the world faced a pressing challenge: how to sustainably increase food production to meet the demands of a rapidly growing population. Nitrogen, an essential element for plant growth and protein synthesis, was abundant in the atmosphere but largely inaccessible in a form usable by plants. Many people would set sail on the ocean to find islands close to shore that were mostly used by various bird species to mate. On these islands were large quantities of Guano (Bird feces), even mountains of it. Guano would consist of roughly 20% Nitrogen so it was a profitable business to collect and sell bird guano to farmers. But as one could imagine such a high demand for guano caused it to eventually start running out and Peru stopped further exports of guano to save it for themselves.

More than 78% of air is nitrogen, it is not a rare resource but it is in a form that is hard to separate. It is one of the strongest, two nitrogen atoms are triple-bonded together. The method we use to measure the strength of a chemical bond is to determine the energy it would require to break these said bonds. If we were to scale this and compare it to other elements that are common in air. It would take 2.5 eV (Electron Volts) to break apart two chlorine atoms, it would take 3.8 eV to break away two carbons and break apart two oxygen atoms it would take 5.2 eV but it would take 9.8 eV to break apart two nitrogen atoms. This is a massive amount of energy [3, 7]. aber became interested in this problem when he was working as an academic at the Karlsruhe Institute of Technology. His idea was to combine hydrogen and nitrogen not only at really high pressures but also at a high temperature and combine these with a catalyst A catalyst is a substance that speeds up a chemical reaction or lowers the temperature or pressure needed to start one, without itself being consumed during the reaction).

Haber was able to get his hands on a rare element called osmium as well as he worked in a company that experimented with these substances. This would be perfect as a catalyst [1, 6].

He worked five years on this project and eventually, he placed a small amount of osmium into a pressure chamber and then he heated nitrogen and hydrogen together using the said osmium as a catalyst. Under these extreme conditions nitrogen and hydrogen reacted with one another and after cooling it a few drops of ammonia, about a milliliter dripped into a beaker. He was finally able to do it. After this, a flabbergasted Haber ran around the institute screaming, bursting into random laboratories, and yelling "Come on down! There is ammonia!" Today this process is called the Haber-Bosch process. This was later industrialized by Haber's brother-in-law Carl Bosch who was also a fellow chemist that worked in Germany's biggest chemical company BASF Aktiengesellschaft. After it became common use people started talking about making bread out of air, farmers were able to grow more than four times as much food on the same plot of land [1, 2, 6].

After his discoveries, Hauber became a very wealthy man. He was widely popular and got a promotion becoming the Founding Director of the Kaiser Wilhelm Institute for Physical Chemistry and Electrochemistry in Berlin. He became friends with some of the most bright minds of their time including Einstein who he became really good friends with. Einstein even stayed the night in the Haber household after he separated from his first wife in 1914 [1].

Though after all of these, we are still yet to talk about why Haber is known as the man who killed millions but saved billions. When the Great War started in 1914, as a devoted German patriot in contrast to his good friend Einstein who was a widely known pacifist and humanist he wholeheartedly devoted his wing of the Kaiser Wilhelm Institute to inventing and supporting the Imperial German Army's need for synthetic and chemical materials [1, 3, 4].

Using the famed German chemist Wilhelm Ostwald's process for the oxidation of ammonia to ammonium nitrate (Nitric acid) he began developing certain high-powered explosives that were used in artillery shells and different varieties of bombs [1].

A year into the war in 1915, Haber became a consultant to the German War Office where he first started experimenting with chlorine gasses for potential use on the battlefield. Although the uses of such gasses were forbidden by the Hague Convention, the Entente and the Central powers experimented and used these weapons of unimaginable suffering.

However, Hauber found it difficult to find any field commanders who would agree to even test these in the field. One general even said that it was “unchivalrous” to use poison gas on the battlefield. According to some accounts, Haber claimed, “If you want to win the war, then please, wage chemical warfare with conviction.” [1, 3, 4]

After a while though, the military started requesting tear gas and other irritants to use in the field. Seeing this, Haber proposed to use the chlorine gas as a chemical weapon. This suggestion was put to action in the Battle of Ypres, France in April 1915. It had a devastating effect on the battlefield, more than 6000 people would lay dead in the muddy trenches after the first wave of gas

Chlorine gas was 2.5 times heavier than air, it would creep towards the enemy trenches and then it would sink into the trenches. The chlorine gas first causes a reflex that forces one to hold their breath. And then when the person would ultimately gasp for air. The chlorine reacts with the water in the cells of your throat, mouth, and lungs to create Hydrochloric acid (HCL) and Hypochlorous acid (HCLO). These acids scour the lining of the lungs and together with the water fill the lungs and effectively drown the victim on land. 100.000 people would die in the war due to the effects of the gas alone. Yet it couldn’t break the stalemate like Haber said [1, 3].

Among all of this, Haber would have to face a personal tragedy. After a dinner party, Haber would take some sleeping pills and get into bed. While he was sound asleep, his wife, Clara would grab his husband’s pistol and go outside. She does the unthinkable and commits suicide by firing a single shot into her chest. Sadly their 12-year-old boy would witness this.

Ultimately, Germany loses the war. Ironically in part due to a lack of fertilizers in the homefront and food as the military confiscated most of the ammonia fertilizer to create gasses and explosives. Fritz Haber’s work would also lead to the development of a deadly pesticide known as Zyklon B. This gas would tragically be used by the Nazis during the holocaust and serve as the primary gas used in the infamous gas chambers [3, 5].

Haber faced accusations of being a war criminal after the war, but he argued that if he was a criminal, then so were those who made the bombs and bullets he also mentioned that almost all of the major powers in the war had used chemical gasses during the war as well. One year after the war in 1919 he was awarded the Nobel Prize for Chemistry. This polarized the science community as some imminent peers and past winners refused to show up, and some past winners even unannounced their victories and prizes in protest [1, 3].

He also experimented with recovering gold from the sea to pay for the crippling war debts of Germany. He also started having economic problems as the factory Carl Bosch opened exploded after multiple complications (As we previously mentioned ammonium nitrate is highly explosive) and he lost most of his money during the times of hyperinflation.

He also carried on with his research on gas warfare in Spain and the Soviet Union, pretending to dismantle gas weapons. He kept newspaper clippings of his first attack in Ypres framed in his study [3].

In the past and even now, many are unsure how to judge Haber's legacy. On one side, his ammonia formula saved millions from starvation in his time and continues to feed billions today. More than half of the world's population is alive thanks to the boom in agriculture that occurred after Haber's invention.

This elevates him to the ranks of scientific geniuses like Tesla, Curie, and his friend, Einstein. On the flip side, he created some of the most dreadful weapons ever conceived and used them on fellow humans with pride.

In 1919, he won the Nobel Prize for Chemistry, but due to public outcry, he couldn't accept the medal at a ceremony. He had to wait six months and wasn't accepted by the Swedish King. he partly redeemed himself by defying Hitler and the Nazis (whom he called 'scum') when they demanded he fire all his Jewish scientists. Despite being of Jewish descent, Haber was still seen as a war hero in Germany at the time – unlike pacifist Einstein – and his resignation deeply embarrassed Hitler.

Despite his defiance against Hitler, the stigma of gas warfare followed him when he tried to find work abroad. He eventually secured an unpaid position at Cambridge in the UK, where he was still widely disliked. He passed away in 1934 in Switzerland while he was trying to move to Palestine.

His final wish was to be buried next to his wife, Clara.

It is sometimes scary how much one person can affect the course of history. And yet still be unknown by many.

MODERN ART: WHAT AM I SUPPOSED TO SEE?

WRITTEN BY: ARDA BORA KARAHAN

What do you see while looking at Salvator Mundi, attributed to Leonardo da Vinci, that was completed during the Renaissance Revival? Leonardo da Vinci, as a contributor to the High Renaissance (1), portrayed Jesus in a humanist way with Renaissance dress as the savior of the world and the master of the cosmos (2).

He is shown with two fingers of his right hand stretched as he makes a benediction, and in his left hand, a crystal orb is seen to be held, symbolizing the crystalline sphere of the heavens and alluding to the master of the cosmos (2,3) This accuracy might be obligated by entailments of artistic movement he impressed or just a personal choice, but it is a fact that most likely you will see similar things as I mentioned.

Now, let's take a look at Black Square by Kazimir Malevich in 1915 (4). In your first look, you are likely to see randomly placed off-form white lines on a blue square. Now, let's examine it by taking into account history. Malevich is one of the pioneers and perhaps the only Suprematism delegate. Suprematism focuses on geometric shapes such as circles, squares, and crosses on a dark background (5). Its artists believed these seemingly basic shapes held within them the pure, distilled essence of our human existence.

A plurality of art historians, curators, and critics interpreted that the Suprematist square introduced the "world of feeling"(6), and the white line is representative of its border (6,7), isn't it? Is it?

Was it what he wanted to tell us? The funny thing is there is no right or wrong way to look at it, so the uncertainty of the message aimed to be given led people to regard modern art as strange for decades.

Before explaining, I want to differentiate two adjacent terms: modern art and contemporary art. Modern and contemporary art are types of two different periods.

Modern art refers to art created from the 1880s up to the 1970s (9). Generally, “The Sunflowers” by Vincent van Gogh, “The Scream” by Edvard Munch, and “The Young Ladies of Avigno” by Pablo Picasso (10) are a few examples of artworks from the modern art period.

Contemporary art is the art of today, produced in the second half of the 20th century or the 21st century (11), and the main period we will talk about. However, I will use modern as a representative of contemporary art, which could delegate both of them.

For an artwork to be considered “trash”, most people evaluate it with similar factors: the fact that a lot of the work produced during these periods is either ugly or far too simple, and also has no message to convey (7).

However, an artwork can not be ruled out without a message, because any artwork is a stimulus as an answer to the environment.

Just like Salvator Mundi or any other religious works of da Vinci and Michelangelo that were made under the control of patronage by the Roman Catholic Church and other powerful religious leaders of the time, modern art developed as a reaction to the vanishing of reason, optimism, and beauty due to changes in politics, and technological revolutions in the late nineteenth century and early twentieth century.

Compared to the other types of art, modern art is difficult to understand, so they have to demonstrate something clearly. Modern art born out of elitism sounds meaningless because if an artwork’s message reaches a restricted fraction, the rest of the world will call it absolute trash.

Eventually, to simplify their works, another term was suggested “Reductionism”. This school of thought was concerned that paintings were two-dimensional surfaces with paint on them, and they should remain as such (8).

The paintings shall not explain a story, but they should instead be a quest to find out the truth, and this could be managed by eliminating the odd surfaces.

Perhaps the most nonplusing trait of modern art is being an art in which the artwork is an idea instead of a thing. Unlike conventional artwork with high skill, craftsmanship, and content, modern artwork might be realized with found objects or only restricted use of conventional media like painting or sculpture, to reveal a “so-called conceptual art”.

What if someone puts a dumpster on a busy street in a city center, and labels it as a museum, is every trash thrown into it regarded as an artwork exhibited in a museum? With the ideology of modern art, it should be, because the main focus of modern art is upon ideas, not objects. Here is another one.

If I put a fountain in the middle of the Louvre Museum in Paris, France, would the visitors be enthralled and gather around, or would they think there is a sewerage work? I used this fountain example to replicate a milestone of art history: Marcel Duchamp’s Pisuvar.

Even if it sounds ridiculous, this artwork was then symbolized as a rebellion against the institutionalization of art. Marcel Duchamp, as a delegate of Dadaism, deciphered most of the paintings before World War I “retinal”, that is, unnecessarily eye-pleasing, and told art to “re-present to service of the mind.” Dadaism was realized as a style of protest against the barbarism of World War I and intellectual rigor and erotism in daily life and art.

In “L.H.O.O.Q.”, another painting of Marcel Duchamp under the title of “Dadaism”(12), he exemplifies the use of readymade objects to break down the prejudices surrounding art by using one of the most famous artworks of all times: Mona Lisa.

Just like the fountain, this artwork consists of impropriation and alteration of a ready-made work, or in other words, adding a mustache and beard. Here, Duchamp found a postcard of the Mona Lisa, and he drew a mustache and beard on it.

The title is a pun on a French statement “*Elle a chaud au cul*”, which has lots of deficit meanings, one of them was “She is hot in the arse.”(13).

Thus, it indicates the fact that the presentation of modern artwork is not needed to convey the main ideology.

Well, what will the future of modern art be like? Startlingly, considering its immaturity and novelty compared to the other types, it already has a big contribution of “$2.7 billion(14)” in market turnover and forms 15% of the global art market.

Given the present unpredictability and obscurity of existing events, it will be difficult to state shrewd ideas, but we have a chance to make some predictions accompanied by past events. The future mission of modern art could be transformed into another way dissimilar from today's. Within the approach of which extinguishes the differentiation of artwork and "trash", modern art could start to be utilized for several purposes. It has already started, indeed. The Central Intelligence Agency was revealed to use modern artworks as a weapon throughout the Civil War. During the Civil War, the decision to include the intellection of art and culture in the deposition of the US was taken as the CIA was founded in 1947. (15) Against the socialist and communist regime of Soviet Russia, the US, and CIA started to support and commercialize America's anarchic avant-garde movement, "Abstract Expressionism". Abstract expressionism is a 20th-century modern art movement in which attitudes and emotions are expressed through nonrepresentational means with nonobjective art, including painting, sculpture, and graphic art, that does not represent recognizable objects. To maintain and indicate the superiority in terms of art and culture, the CIA fostered the artworks of artists such as Jackson Pollock, Robert Motherwell, Willem de Kooning, and Mark Rothko, the abstract expressionist artists. Through the artworks of these artists, Socialist Realism, engorging itself on revolutionism in Soviet Russia was blamed for being rigid and confinable.

In brief, any example given conveys the same thing: the artworks that seem to be made unguardedly and pointlessly were not realized for people to be concerned about its look, but to indicate the point that any object on the "chopping block" is enough to tell the message. Thus, the art movement that was heavily criticized has already gained a place in our lives and will keep interacting with us as long as it serves its primary purpose and conveys its message.

EXAMINING PAST AND CURRENT ANTI-TRANS LAWS IN CALIFORNIA

WRITTEN BY: YIGIT EFE NAS

California and, especially, San Francisco has been the hub of transsexual history, culture, and archival records. With the development of transsexual culture came resistance from con- servatives, whites, and politicians.

This was followed by the ratification of anti-trans laws and policies throughout the state. Even though many of these laws have been overturned, new laws and policies pass out of sight in the state.

In this paper, we will examine and compare past and current anti-trans laws in California and how the trans community led resentment against these laws.

California has been the land of new and divergent since Garci Rodŕıguez de Montalvo wrote about the land of mystical creatures and gold in his book named ”Las Sergas de Esplandĭan” (The Adventures of Esplandĭan) in 1510, before the discovery of California [7].

Before Columbus arrived and California, later, was discovered by Juan Rodŕıguez Cabrillo, some of the indigenous cultures highly respected transsexuals in California, sometimes on a level not seen before.

Some of these practices and cultures can be listed below:

The Chumash people of Southern California recognized and hon- ored individuals known as ”Nukat,” who were assigned male at birth but lived and performed tasks typically associated with women.

They played important roles in society, including roles in healing and spiritual practices [8].

The Yurok tribe in Northern California acknowledged individuals known as ”Hemisexuals” who were assigned male at birth but lived as women. They were respected members of the community and played roles in healing and ceremonial practices [1].

Navajo and Sioux: Among the Navajo, the ”Nʼadleehi” were individuals assigned male at birth who embodied both masculine and feminine qualities and played important roles in their communities. Similarly, the Lakota Sioux recognized the ”Winkte” as individuals who had both male and female spirits [5].

The concept of Two-Spirit, found among various Indigenous cultures throughout North America, included individuals who embodied both masculine and feminine qualities or identified as a third gender. In California, tribes such as the Ohlone, Miwok, and Pomo had their own terms and roles for Two-Spirit individuals [22].

Looking at the examples, it is more than possible to say that indigenous cultures of the Americas highly respected trans people. However, 2 points should be noted:

Even though we provided examples of trans rights in the indigenous cultures, the 2 biggest American civilizations, the Inca and Aztecs, both had strong social classifications and often did not recognize individuals who did not fit the traditional binary model [10, 14].

Similar to indigenous cultures in the Americas, ivilizations such as South Asians, Polynesians, and Egyptians also respected trans rights. In some South Asian cultures, such as in India and Nepal, the concept of ”Hijra” has existed for centuries. Hijras are a distinct social and cultural group that includes transgender women, intersex individuals, and eunuchs. They have been recognized and respected within their communities, often performing ceremonial roles at weddings and childbirth [13].

Polynesian cultures, including those in Samoa, Tahiti, and Hawaii, have recognized the existence of ”Fa’afafine” or ”Mahu.” Fa’afafine are assigned male at birth but take on female gender roles and often live as women within their communities. They are accepted and valued for their contributions to society [29].

Egyptian Culture: In ancient Egyptian society, there is evidence of individuals known as"Eunuchs" who were often assigned male at birth but underwent castration and took on roles in the royal court and religious institutions. While their experiences may not align directly with modern transgender identities, their existence suggests an acceptance of gender diversity in ancient Egyptian culture [11]

Based on the examples, the Americas accepted non-binary gender identities, but how did California become an anti-trans place?

Transgender studies in California grew out of the broader field of queer studies, which gained prominence in the 1990s as an interdisciplinary field exploring non-normative sexualities and gender identities. While transgender studies share intellectual and activist roots with queer theory, it has developed its own unique focus on transgender experiences and identities.

Later, transsexual studies managed to separate itself from the Queer Theory, developing in its shadow for over a decade. Transsexual studies followed their own trajectory to address issues related to gender, identity, and embodiment.

About this separation, Susan Stryker, a gender and human sexuality professor, states that "This seems particularly true of the ways that transgender studies resonate with disability studies and intersex studies, two other critical enterprises that investigate atypical forms of embodiment and subjectivity that do not readily reduce to heteronormativity, yet that largely fall outside the analytic framework of sexual identity that so dominates queer theory. [26]"

One key aspect of transgender studies is its emphasis on centering transgender individuals, their experiences, and their voices in academic scholarship and activism. The field seeks to explore the diverse ways in which transgender people navigate gender, sexuality, identity, embodiment, and social structures. It places transgender experiences at the forefront, aiming to challenge and disrupt normative assumptions about gender.

Transgender studies in California also seek to go beyond the medicalization of transgender dentities. While medical and psychological perspectives have historically dominated the understanding of transgender experiences, this field of study aims to consider broader social, cultural, and political dimensions of transgender lives. It critiques the medical model and seeks to understand transgender experiences within larger systems of power, privilege, and oppression [19].

Interdisciplinary approaches are central to transgender studies, drawing from various fields such as sociology, anthropology, history, cultural studies, psychology, and more. Scholars in his field employ diverse methodologies to analyze the complexities of transgender experiences, activism, representation, and cultural production.

Transgender studies in California are closely aligned with transgender activism and so-cial justice movements. Scholars actively engage in advocacy work, contributing to policy changes, challenging discrimination, and amplifying the voices of transgender individuals in academia and society at large. The field seeks to foster social change and create inclusive spaces for transgender individuals within and beyond academic settings [27].

Several universities in California offer transgender studies programs, courses, and research opportunities. These programs provide dedicated spaces for students and scholars to engage with the field, explore emerging theories and perspectives, and advance transgender studies as a vital area of inquiry.

In the 19th century, California saw the first formalization of long-held anti-trans conducts following the immigration of a huge number of Asians through the Pacific.

With the entrance of Asians, mostly Chinese, came changing economic opportunities. Un-ble to find a job due to the huge number of workers, some Asians began working as sex workers or drag queens. Furthermore, seen as the land of freedom, many Asians began cross- dressing, before the enactment of anti-cross-dressing laws, creating a change in the cultural framework of mostly white California. This caused acculturation between the cultures of immigrants and Californians.

Even though cross-dressing was not illegal in California in the mid-19th century, there are reports of cross-dressers, mostly Asians, getting arrested. This situation got worse following the ratification of a law that criminalized public nudity, indecent exposure, lewd acts, immoral practices, and wearing a dress not affiliated with one's birth sex by the San Francisco Board of Supervisors.

Although there are no official records as to how many were arrested due to this law, it remained in effect until July 1974. Arrests were made as recently as May 1974, when 10 men were arrested in the Tenderloin for wearing women's clothing [24].

With the immigration of Asians and the following anti-trans laws, early 20th-century California was much different than the liberal California we know today. Due to these laws and policies, issues arose from every aspect.

Firstly, anti-trans laws provided a basis for the harass- ment and policing of transgender individuals by law enforcement. Police often used these laws as a pretext to target, arrest, and harass transgender people, subjecting them to humiliation, violence, and unfair treatment.

It is recorded that trans people were often subjected to inhuman treatment, withholding them from their basic rights such as the right to an attorney or the right to remain silent.

This situation lasted only until 1966, much before any other development. In August 1966, trans people and drag queens who were eating in Compton's Cafeteria stood up against police violence. The riot began after the restaurant staff called the police on trans customers for being too loud, which was a restaurant policy to get trans people to leave the restaurant. These calls would generally result in police violence to forcibly remove trans customers.

Yet, this time, transsexuals and drag queens in the restaurant rioted against the restaurant policy and police violence, tearing things down and causing havoc. Following the Compton's Cafeteria riot, police violence against trans people took a sharp decrease.

Therefore, it is possible to say that it took 1 resistance from the trans community for the police to leave them alone in their daily lives [25].

Anti-trans laws reinforced societal norms and expectations around gender, further stigmatizing and marginalizing transgender individuals. These laws sent a message that deviating from binary gender norms was unacceptable, leading to social ostracization and discrimination against transgender people.

Anti-trans laws contributed to limited opportunities and discrimination faced by transgender individuals in areas such as employment, housing, and education. The legal barriers reinforced negative attitudes and prejudices, making it difficult for transgender individuals to access equal opportunities and participate fully in society.

This caused many trans people to move to Tenderloin, which is the district of unwanted people in San Francisco.

The existence of anti-trans laws took a toll on the mental health and well-being of transgender individuals. Living under the constant threat of legal consequences and societal disapproval contributed to increased rates of anxiety, depression, and overall psychological distress among the transgender population [24].

Similar to the policy of 1966, California had many other anti-trans laws and policies from the 20th century. These laws and policies caused social and economic issues as stated in the section ”Effects of Anti-Trans Laws in California.

Sodomy laws in California, as in many other states, originated from English common law. These laws were based on moral and religious beliefs that condemned same-sex sexual acts as immoral or sinful.

In California, sodomy was criminalized under Penal Code Section 286, which prohibited various forms of sexual acts, including anal and oral sex. Originally enacted in the late 19th century, Section 286 criminalized both same-sex and opposite-sex sodomy..

Sodomy laws in California empowered law enforcement to arrest and prosecute individuals engaged in prohibited sexual acts. Convictions under sodomy laws could lead to imprison ment, fines, and being listed on the sex offender registry.

Sodomy laws faced significant challenges in the latter half of the 20th century. In 1976, the California Supreme Court, in the landmark case of People v. Onofre, ruled that the state’s sodomy law violated the right to privacy and was unconstitutional. This decision decriminalized private, consensual adult same-sex sexual activity. In 1982, the California Legislature repealed the sodomy law, formally removing it from the state’s Penal Code. This repeal reflected changing societal attitudes towards consensual sexual activities and the recognition of individual privacy rights [15].

Cross-dressing laws, also known as ”anti-cross-dressing” or ”masquerading” laws, were enacted in California and various other states in the United States during the late 19th and early 20th centuries.

These laws made it illegal for individuals to wear clothing that did not align with their assigned sex at birth.

Cross-dressing laws were often justified on the grounds of preserving public order, morality, and decency. They were seen as a means to maintain social stability and reinforce the perceived importance of conforming to gender roles and expectations. In California, the enforcement of cross-dressing laws led to arrests, fines, and potential imprisonment for individuals found to be violating the law.

The specific penalties and enforcement varied, but the underlying purpose was to discourage and suppress non-conforming gender expressions.

Over time, social attitudes and understandings of gender evolved, leading to challenges to the constitutionality and fairness of these laws. Court decisions and changing societal norms ultimately contributed to the repeal or invalidation of many cross-dressing laws.

The exact timeline for the end of cross-dressing laws in California is not easily pinpointed, as there was no single definitive event or legislative action that universally repealed them.

Instead, the decline and ultimate invalidation of cross-dressing laws were the result of a combination of factors, including changes in social attitudes, legal challenges, and the broader LGBTQ+ rights movement. As society progressed and gained a greater understanding of gender diversity, the enforcement and relevance of cross-dressing laws diminished, rendering them effectively obsolete [23].

Historically, transgender individuals in California faced employment discrimination without explicit legal protections. Prior to the passage of the Gender Nondiscrimination Act in 2003, there were no state laws explicitly prohibiting discrimination based on gender identity or expression.

Transgender individuals often faced discrimination during the hiring process. Employers may have harbored biases or stereotypes about transgender individuals, resulting in their exclusion from job opportunities.

Transgender employees were subjected to harassment, bullying, and a hostile work environment. This could include derogatory comments, intentional misgendering, and other forms of mistreatment, creating a toxic workplace atmosphere.

Transgender employees frequently experienced unfair treatment, such as being denied promotions, raises, or training opportunities due to their gender identity or expression.

This led to limited career advancement and wage disparities compared to cisgender counterparts.

In the past, many employment-based health insurance plans excluded coverage for transgender related healthcare, including gender-affirming treatments and procedures.

This lack of coverage created additional barriers to accessing necessary medical care for transgender individuals [16].

In the 20th century, transgender individuals in California faced significant barriers to accessing gender-affirming healthcare.

Medical providers often denied necessary treatments or surgeries based on discriminatory beliefs, impeding transgender individuals' ability to receive adequate healthcare.

Many healthcare providers have historically denied transgender individuals access to gender-affirming treatments such as hormone replacement therapy (HRT) or gender confirmation surgeries. These denials were often based on discriminatory beliefs and resulted in significant barriers to accessing necessary and life-affirming healthcare.

Transgender healthcare, including gender-affirming treatments and procedures, has been frequently excluded from insurance coverage.

This exclusion has placed a financial burden on transgender individuals, making it difficult to afford essential medical interventions and potentially leading to disparities in healthcare access.

Insurance companies and healthcare plans often excluded coverage for transition-related care, including hormones, surgeries, and mental health services specific to gender transition. These exclusions resulted in transgender individuals being unable to access crucial healthcare interventions that are essential for their well-being.

Mental healthcare for transgender individuals has historically been limited and inadequately provided. Many healthcare systems did not prioritize or offer specialized mental health services that address the unique needs and challenges faced by transgender individuals, such as gender dysphoria and the impact of societal stigma [9].

ın response to discrimination and marginalization, the trans community in California and across the United States has been actively advocating for their rights, visibility, and inclusivity.

Possibly the biggest development has been the development of Compton's Transgender Cultural District.

The Compton's Transgender Cultural District, established in San Francisco, California, is the first legally recognized trans-gender cultural district in the world. The district seeks to preserve and celebrate transgender history, culture, and contributions.

It provides a physical space where the trans community can thrive, fostering economic development, community support, and visibility.

The Transgender District emerged from the efforts of community organizers, activists and local residents. Its establishment was driven by the need to address issues faced by the transgender

Numerous organizations in California, such as the Transgender Law Center (TLC), Gender Health Center, and Transgender Economic Empowerment Project (TEEP), have emerged to advocate for transgender rights, provide legal support, offer resources, and promote community empowerment.

These organizations work to address discrimination, provide healthcare access, support transgender youth, and fight for policy changes.

TLC is one of the largest transgender advocacy organizations in the United States. It works to change laws and policies to protect transgender individuals' rights and improve their access to healthcare, employment, housing, and education.

TLC offers legal assistance, engages in impact litigation, and provides community education and leadership development programs.

NCTE is a prominent national advocacy organization that focuses on policy advocacy, community empowerment, and education.

NCTE works to advance transgender equality through policy advocacy, public education campaigns, and collaborating with lawmakers and other organizations to promote transgender-inclusive policies.

TEEP is a California-based organization that aims to address economic disparities faced by transgender individuals.

They provide employment assistance, career counseling, financial literacy programs, and entrepreneurship support to help transgender individuals achieve economic stability and empowerment [28].

These organizations are some examples of the larger social movement the trans community
undertook.

Transgender activists and allies have worked tirelessly to push for legal protections against discrimination based on gender identity and expression. California has been at the forefront of implementing inclusive policies, including the Gender Nondiscrimination Act (2003), which added gender identity and expression to the state's nondiscrimination laws. This act prohibits discrimination in employment, housing, and public accommodations.

TLDEF is a national organization that focuses on transgender legal advocacy, education, and policy initiatives. They offer probono legal services, engage in public education campaigns, and advocate for transgender-inclusive policies and protections [3].

The trans community has been instrumental in advocating for improved healthcare access. Transgender activists have successfully campaigned for insurance coverage for gender-affirming treatments and procedures. California passed legislation requiring insurance companies to cover gender-affirming care, including hormone therapy and gender confirmation surgeries [9].

Transgender individuals and allies have been instrumental in increasing visibility and representation across various fields, including media, entertainment, politics, and activism. Transgender activists and celebrities, such as Laverne Cox and Janet Mock, have used their platforms to raise awareness, challenge stereotypes, and advocate for transgender rights.

In the last few years, especially since the mid-2010s, there have been major laws and proposed bills aimed directly or indirectly at the transgender community. These laws are generally focused on limiting trans people and their activities in social life.

Proposition 8 (Prop 8) was a ballot initiative in California that aimed to eliminate the right of same-sex couples to marry in the state. It was proposed through the initiative process, which allows citizens to propose and vote on changes to state laws through a ballot initiative. The initiative was officially titled "Eliminates Right of Same-Sex Couples to Marry Act [21]."

Prop 8 was highly contentious and sparked intense debates and discussions. Supporters of Prop 8 argued that marriage should be defined as between one man and one woman, based on religious or moral beliefs. Opponents of Prop 8 argued for marriage equality, asserting that same-sex couples should have the right to marry and enjoy the same legal protections and benefits as heterosexual couples.

The campaign leading up to the vote on Prop 8 involved extensive fundraising, advertising, and grassroots efforts from both sides. Supporters of marriage equality organized protests and educational campaigns, while proponents of Prop 8 focused on traditional marriage arguments. Ultimately, Prop 8 passed in the November 2008 election.

Prop 8 faced legal challenges. In 2010, a federal district court ruled Prop 8 unconstitutional, stating that it violated the Due Process and Equal Protection Clauses of the United States Constitution. This ruling was appealed to the Ninth Circuit Court of Appeals, which upheld the district court's decision. The case, known as Hollingsworth v. Perry, eventually reached the U.S. Supreme Court [12].

The legal battles surrounding Prop 8 brought significant attention to the issue of marriage equality and LGBTQ+ rights. The Supreme Court ultimately decided the case on procedural grounds in 2013, allowing the district court's ruling to stand. This effectively restored the right of same-sex couples to marry in California [17].

"Bathroom bills" is a term commonly used to refer to proposed or enacted legislation that seeks to regulate transgender individuals' access to public restrooms and other gender-segregated facilities.

Despite the state's past and current efforts, it should be noted that California is still a safe haven for the transgender community and was one of the first states to protect the rights of transgender people. Here, are some examples of California's trans laws or proposed bills.

SB 179 aimed to simplify and streamline the process for transgender and non-binary individuals to obtain accurate identification documents that reflect their gender identity.

It recognized the importance of self-identification and sought to remove barriers and requirements that transgender individuals often faced when updating their gender markers on official documents.

The Gender Recognition Act expanded the options available for individuals seeking to update their gender markers on identification documents.

It allowed individuals to choose a gender category other than "male" or "female" for their driver's licenses, birth certificates, and other state-issued identification documents.

One significant aspect of SB 179 was the removal of the previous requirement for individuals to provide a physician's statement or proof of medical intervention, such as gender affirming surgery or hormone therapy, in order to update their gender markers.

This change recognized that gender identity is a matter of self-identification and removed medical gatekeeping from the process.

SB 179 also introduced a non-binary gender category, in addition to male and female, for individuals who do not identify strictly as male or female.

This acknowledgment of non- binary identities reflected a growing recognition of gender diversity and aimed to ensure inclusive identification options for all Californians [4].

Bathroom bills typically target transgender individuals, specifically transgender people whose gender identity does not align with the sex they were assigned at birth. These bills often aim to restrict transgender individuals' access to restrooms that align with their gender identity.

Bathroom bills have sparked significant controversy and debates. Supporters of these bills often argue that they are necessary to protect privacy, and safety, and prevent potential instances of harassment or assault. Opponents argue that such bills are discriminatory, stigmatizing, and unnecessary, as they perpetuate harmful stereotypes and infringe upon the rights of transgender individuals.

Bathroom bills can have legal implications and raise constitutional questions. Some argue that these bills violate anti-discrimination protections based on gender identity or sex in existing laws. Courts in some jurisdictions have ruled against bathroom bills, finding them to be unconstitutional and discriminatory.

The specifics of bathroom bills vary across jurisdictions. Some bills explicitly restrict transgender individuals' access to facilities based on their sex assigned at birth, while others propose alternative solutions such as creating separate or segregated facilities for transgender individuals [20].

In recent years, there have been proposed bills in California aiming to restrict transgender individuals' access to restrooms and other gender-segregated facilities based on their gender identity. These bills sought to force individuals to use facilities corresponding to their assigned sex at birth rather than their gender identity.

These laws or proposed bills were aimed at the transgender community of California; however, none of them had the ground to advance in California's deep-blue Assembly.

AB 2119 aimed to ensure that transgender and gender non-conforming foster youth in California have access to appropriate and supportive healthcare services.

The bill recognized the unique needs and challenges faced by these youth and sought to address potential barriers to accessing gender-affirming healthcare and support services.

AB 2119 recognized that providing appropriate healthcare to transgender and gender non-conforming foster youth is crucial to their overall health, well-being, and identity development. The bill sought to ensure that foster youth can access gender-affirming care.

Senate Bill 932, enacted in 2018, established the Transgender Wellness and Equity Fund. This fund aims to support transgender and gender non-conforming individuals in California by providing grants for programs nd services related to health, wellness, and equity [18].

Assembly Bill 2826, introduced in 2018, sought to prohibit the denial of gender-affirming healthcare coverage for transgender individuals by health insurance providers. While the bill did not progress beyond the committee stage, it reflected efforts to ensure equitable access to necessary medical care for transgender individuals [2].

In conclusion, this research paper provides a comprehensive examination of both past and current anti-trans laws in California, shedding light on the progress made and the challenges that persist for the transgender community.

Looking at the past anti-trans laws, such as sodomy laws and cross-dressing laws, it is evident that they were deeply rooted in societal norms, discrimination, and the desire to enforce binary gender roles.

These laws subjected transgender individuals to harassment, policing, stigmatization, and limited opportunities.

They reinforced societal expectations around gender, leading to social marginalization and psychological distress. The effects of these laws were far-reaching and had a detrimental impact on the well-being and livelihoods of transgender individuals.

In contrast, the current landscape of anti-trans laws in California reflects a significant shift towards inclusivity and protection of transgender rights. The state has implemented laws and policies that recognize and affirm gender diversity.

Examples such as the Gender Recognition Act (SB 179), the Foster Care Non-Discrimination Act (AB 2119), and the Transgender Wellness and Equity Fund (SB 932) highlight the efforts to remove barriers.

These current laws focus on streamlining the process for legal gender recognition, ensuring healthcare access and support for transgender youth, and establishing resources to address the unique needs of the transgender community.

They represent important steps towards creating a more inclusive society that respects and upholds the rights of transgender individuals. While there have been positive developments, it is important to acknowledge that challenges persist.

The paper reveals ongoing issues such as discrimination, limited healthcare access, and societal stigmatization that transgender individuals still face.

Furthermore, the emergence of proposed bills aimed at limiting transgender rights, as seen in the discussion of Prop 8 and bathroom bills, underscores the need for continued advocacy and vigilance.

In comparing the past and current anti-trans laws, it becomes evident that progress has een made in California.

The state has shifted from a history of oppressive and discriminatory laws to enacting legislation that seeks to protect and support transgender individuals.

However, it is crucial to remain vigilant and actively work towards dismantling the barriers that transgender individuals continue to encounter.

In conclusion, the trajectory of anti-trans laws in California showcases a complex and evolving landscape.

While there has been significant progress, there is still work to be done to ensure full equality, inclusion, and acceptance for transgender individuals in the state.

Continued advocacy, education, and policy changes are essential to create a society that recognizes, respects, and upholds the rights and dignity of all individuals.

Regardless of gender identity.

WOMEN RIGHTS IN THE USSR

WRITTEN BY: AVJIN AKTOP

Women have been subject to sexism, racism, and economic inequality for years especially after humanity settled down. With the agricultural revolution in the Neolithic Period, the matriarchal society structure gradually surrendered to patriarchy, and sexual freedom disappeared as the concept of private property emerged for the first time in history. That the man who owned the property had to restrict the sexual intercourse of the woman so that he could know that his children— whom he would inherit from his private property— was the underlying reason for the enslavement of women. The only and sacred job of women for centuries has been determined as motherhood by men; no other job has been assigned to them other than housework; they have not found a place in any social area other than the home; and worst of all, the concepts of morality and honor have always attributed to them by objectifying their bodies.

The women's problem has been the bleeding wound of the world for centuries but still has not been fully resolved. Since the issues that women encounter every day are varied across religions, cultures, and territories; it is hard to manifest one system over another. However, today, we will closely look into what socialism offers in the country which is the most known instance of where socialism was practiced, or at least, tried to be practiced, the Union of Soviet Socialist Republics (USSR). Although some reformations were made in women's rights at the time when it was first established, the inhumane conditions and heavy burden of Gosplan (5-year economic plan) receded not only women's rights but also all living on these bureaucratic territories.

Socialism is primarily a political-economic theory that proposes the abolition/ socialization of private ownership of the means of production.[1] Socialism first appeared in the 19th century with thinkers Robert Owen, Charles Fourier, and William Morris, but its real impact spread through Karl Marx and Friedrich Engels' (1848) book The Communist Manifesto. Described as a transitional system between liberal capitalism and communism, socialism found the opportunity to show itself in practice with the USSR, the former Russian Federation, which reigned between 1917 and 1991. Whether or not socialism has found a solution to the women's problem can also be observed from the laws and actions of the USSR.

According to the advocates of socialism, patriarchy and capitalism benefit from each other. The concrete foundation of patriarchy is reflected not only in raising children in the family, but also in all structures that allow men to control women's labor: they receive free service at home; they have a privileged position in the labor market vis-à-vis women.[2]

Karl Marx emphasized the significance of the social position of women for uplifting society as a whole and asserted that women will pioneer the change in regimes.[3]

As in the 1917 Bolshevik Revolution, women did so: they, who had no place in social life in the old administrative structure, rose to a cultural, economic, and social level that they had never been before until Stalin came to power in the newly founded socialist regime.

However, when the USSR collapsed in 1991, there was no wholesale development of women's rights, looking at the last century as a whole.

Although there are many parameters affecting this situation, the fact that socialism was not implemented in practice in the USSR was perhaps one of the most striking reasons.

However, to make any kind of comparison, it is necessary to look at the situation of women living in the Russian Empire first.

Women were under the pressure of husbands, religion, and the Tsarist power during the reign of the Russian Empire. No laws effectively protected women and their labor, and it was this deprivation of rights that determined the general conditions that they were in.[4]

Even the reduction of working hours to 11 hours a day was won as a result of great struggles. With all mental occupations close to them, more than 85% of women were already illiterate. In cultural and social life, women had difficulties in finding a place for themselves.

The day after the Great October Revolution, the Communist party—led by the proletariat—destroyed dogmas and made men and women equal before the law did, declaring that this was only the beginning of the long-term revolution.

At the same time, new executive bodies were established in order to enforce the representation and active participation of women in this novel system.

Rosenberg, one of the famous socialist feminists, mentioned in her book *Women and Perestroika*, that about 15 thousand women were the heads of collective production enterprises, about 500,000 were representatives, and 27 thousand women were either in the position of chairman or vice-president of the local Soviets.[5]

Apart from representation and active participation, the Soviet power also dealt with the issues of women's labor, protection of mother and child, childcare, and socialization of domestic activities, even in the first week of the revolution.

In the previous regime, schools and courses were opened for the rest of the society, the majority of whom were illiterate, their working hours were shortened for their active participation, and their children were given care

. In these schools, women not only learned to read and write, but also gained vocational knowledge.

As a result of such steps taken in the USSR towards the economic independence of women, the number of women literate in the 1930s dramatically increased.[6]

In the years it was founded, the USSR was one of the most progressivist countries for women to make decisions about their own bodies.

In 1920, it became the first country to grant women the legal right to abortion, and the number of women who had abortions reached 700 thousand in 1934.

The rights of men and women in the case of divorce were equalized, besides, divorces started to increase with the removal of justice from the influence of religion, and women were able to receive alimony with the new law arrangements.

Being able to receive alimony was of vital importance for women who at that time had no other source of income other than their father and their husband.

Thus, women who had nothing to sell but their fertility were prevented from prostitution. [7]

At the same time, women were directed to working life, and facilities were provided for mothers.

Maternity leave has been extended to 112 days, and breastfeeding leave was given every 3 hours for working mothers.

Women were forbidden to work in coal mines and keep watch during night shifts not to do harmful work to their health.[8]

Unfortunately, these acquisitions did not last forever: many of the gains made with the revolution faltered as Russia fell into a state of isolation in the despair of war and internal devastation.

Under the dictatorship of Stalin, who remained the sole authority at the end of the 1920s, the country was perhaps in a worse situation than in the last decade of the empire, from which, women and family life were affected at the highest level.

The issue of improving women's rights was pushed into the background, and even discussion of this issue was forbidden.

Although women had more rights than before, working conditions were not the same as men: officially they were paid equal wages for equal work, but women's wages amounted to 75% of men's.[9]

The women's working conditions were also deteriorated: The report in "*Sotsialisticheskaya Industria*"[10] states that textile factories were built before the revolution: the conditions in showers and toilets were poor, and the loud noises of the machines caused a great deal of hearing loss in women; nevertheless, the factory clinics were dysfunctional.

Another report presented in 1987 showed that women do 30-50% of heavy work in the timber, pulp and glass industries, which led to women having great difficulties in giving birth and increasing infant mortality.

Although the unions took the initiative and worked to improve these conditions, the recommendations were not accepted by the higher authorities who wanted to make the Gosplan (5-Year Plan) successful.

The Soviets could not put many decisions and amendments in old laws— framed regarding women's rights in 1917-18— into practice.

While trying to encourage saving due to the economic trauma experienced from the containment policy led by the US, women whose husbands were working were also fired. The ideological cover was created by stating that the first job of a woman is motherhood in the 17th Congress by Stalin.[11]

In 1936, a woman's right to decide about her own body was taken away with the prohibition of abortion.

The definition of "Soviet Family" was made in the Constitution, and an attack on the family institution was considered an insult to the state. It has been made almost impossible for a woman to divorce and receive alimony, and the courts have tried to persuade couples who want to divorce.

The Soviets, describing sexual freedom and abortion as immoral, awarded women who were far from these with superior maternity medals.

Although Khrushchev and Brezhnev, successors of Stalin, made superficial changes regarding the issues women faced, not much progress could be made.[12]

Abortion was legalized again after 20 years, but the surgery conditions were not improved. Women still haven't been able to get jobs in senior professions or in the party.

Working conditions in the industry were not enhanced, and pregnant women were subject to average wages on the days they were considered on permission.

Even though Soviet women pioneered the revolution to uplift their living conditions, what happened afterward hindered the rise. Yet it would be an anachronistic mistake to deny the enormity and significance of these historical struggles.

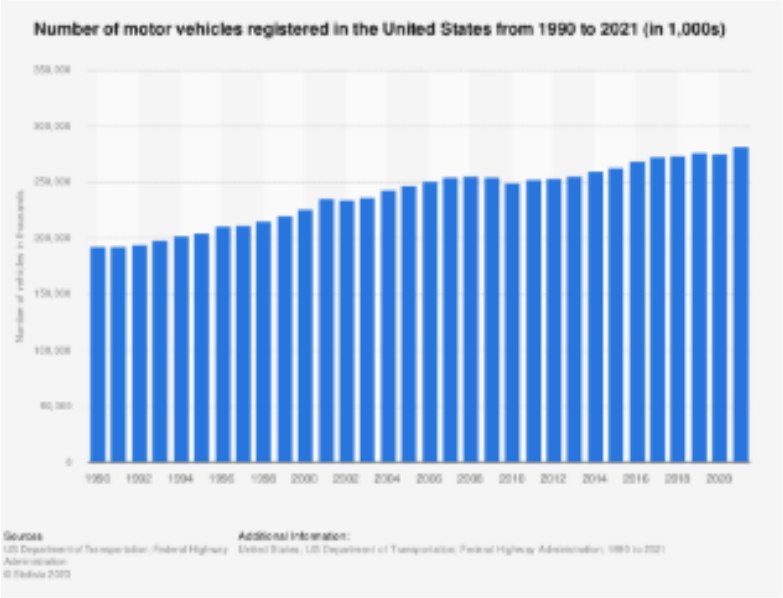
TRAFFIC CONTROL ANALYSIS: ROUNDABOUTS VS. SIGNALIZED INTERSECTION

WRITTEN BY: ADANUR NAS

Defined as “the vehicles that are on a road at a particular time” by the Oxford English Dictionary, the concept of traffic, in the context of transportation, has been around in various forms for centuries. From using camels in deserts to horse-drawn carriages to cars, humans have adapted to different means of transportation aligning with the accessibility and level of development and innovation of the time that they were living in.

As the human societies progressed, technological innovations and societal rules developed and improved interrelatedly as well. These developments and improvements can be observed through the development of traffic. The development of traffic is attributable to a couple of factors, including urbanization, the development of transportation infrastructure, the surge in the number of registered cars, population growth, and the need for efficient and fast transportation systems. According to the survey conducted by the U.S. Department of Transportation Federal Highway Administration, the number of cars registered in the United States between the years 1990-2021 mostly followed a positive trend [23].

That is, in 1990, the number of cars registered in the United States was 193,057,380, while this number increased to 282,366,290 by 2021. The histogram prepared by the Statista Research Department illustrates this change in detail [6]:



This increase in the number of cars registered resulted in the excessive occurrence of traffic congestions, traffic jams, and traffic accidents. According to data collected and shared by Global Traffic Scorecard by INRIX, the total number of hours spent in the traffic due to traffic congestion in London was the highest in global with 156 hours in 2022 [12]. This was followed by Chicago IL with 155 hours and Paris with 138 hours. Moreover, on aver- age, the United Kingdom spent 80 hours in traffic due to traffic congestion in 2022, which is a 7 hour increase from the previous year [12].

On the other hand, the United States spent 51 hours in traffic due to traffic congestion in 2022, which is a 15 hour increase from the previous year. Although this increase can be partially attributed to the annulment of rules and temporary laws implemented because of the COVID-19 pandemic, the economic costs of these congestions are non-negligible. In 2022, a typical commute cost $926 in the United Kingdom on average, which followed an increase of $147 compared to previous year.

Likewise, in 2022, a typical commute cost $869 in the United States on average, which followed an increase of $305 compared to previous year. One another significant example to effects of traffic problems was observed in People's Republic of China on the Beijing-Tibet Expressway. Started to form on 14th August 2010 and named as the biggest traffic jam in the world, this traffic jam lasted for approximately 12 days and stretched over 100 kilometers.

In order to combat these traffic problems, government authorities and transportation agencies have come up with various different policies and implementations. Two of them are roundabouts and signalized intersections with traffic lights, which we will investigate and compare in this paper.

Defined as “a place where two or more roads meet, forming a circle that all traffic must go around in the same direction” by Oxford English Dictionary, roundabouts are a type of circular junctions. In roundabouts, vehicles move counterclockwise around a central island. Drivers yield to those already in the circle, promoting smooth traffic flow.

The first emergence of roundabouts can be traced back to 1790s, to the designs of American- French architecture and engineer Pierre Charles L’Enfant [24]. His roundabout designs were not like modern roundabouts, which were introduced in 1960s, but they shared a couple of similarities, such as utilizing circular traffic flow and being a part of circular joints.

Although roundabouts first emerged in the United States, in 2014, there were 1118 intersections per a roundabout in the United States, while this ratio was 45 intersections per a roundabout in France [18]. A couple of reasons can be attributed to this difference in ratios, such as inefficient and late implementation of early roundabouts, different driving culture, and a widespread population in the United States [22]. Furthermore, the United States is not the only country experiencing a hardship in converting and adapting to roundabouts; with similar reasons, countries such as Japan, Canada, and the Republic of South Africa have experienced the same issue as well. In these countries, instead of roundabouts, government authorities and transportation agencies preferred to implement and utilize signalized intersections with traffic lights.

Defined as “a signal that controls the traffic on a road, by means of red, yellow, and green lights that show when you must stop and when you can go” by Oxford English Dictionary, traffic lights are an indispensable and pivotal component of modern urban traffic management systems. At traffic lights vehicles stop or proceed based on the color of the lights.

When the light is green, drivers can move. When it turns yellow, they should prepare to stop. And when it turns red, they must come to a complete stop. This system controls the orderly flow of vehicles at intersections.

Although far from its modern shape and system, the first traffic lights were introduced in 1868 at Parliament Square in London [31]. However, this attempt failed and turned into a disaster when the traffic light exploded and killed the police officer who was working the signs [31]. Government organizations and road engineers had to wait for electricity usage to become widespread in the world. In 1912, American policeman Lester Wire had devised the first electric traffic light in Salt Lake City, Utah. From that point, many engineers improved on his model, and countries systematically converted and adapted to traffic lights and the traffic regulations such a conversion and adaptation needed [17].

As stated earlier, the United States has a preference toward signalized intersections with traffic lights compared to roundabouts. In the United States, as of August 2018, there were 6,302,865 intersections for the 497 urbanized areas [5]. Approximately 360,000 of these intersections were signalized intersections operated by more than 15,000 city, county, and state traffic agencies [7]. This was an increase of approximately 95,000 signalized intersections than the number reported by the Institute of Transportation Engineers in 2004 [4].

This same pattern of increment in the number of signalized intersections can be observed not only in the United States but also in countries such as Japan and France, which is historically more inclined to implement roundabouts than signalized intersections with traffic lights as evidenced by France's position of having the most roundabouts in the world [13].

As much as they are one of the most used traffic control strategies, similar to roundabouts, traffic lights also brought economic burden to countries and, at times, resulted in significant time inefficiencies for drivers. According to an United Kingdom Institute of Economic Affairs report authored by Martin Cassini and Dr. Richard Wellings, then-head of transport, the number of traffic lights has increased by 25% since 2000, surpassing the 5% increase in the number of registered vehicles during the same period [29].

This disproportionate increase has shown that a two-minute delay to each car journey results in an annual loss of around £16 billion, equivalent to 1% of the United Kingdom GDP [29]. Many methods have been proposed and implemented to solve the problem. However, even one of the most suggested methods, traffic signal re-timing, comes with an average cost of $1,500 to $2,500 per signalized intersection [14]. Although this method is proved to be cost-efficient and relatively inexpensive compared to other method, it still needs a well-preserved city budget.

In summary, the main problem concerning roundabouts and signalized intersections with traffic lights is accurately and efficiently deciding which one is more appropriate to implement in a certain location by considering factors such as traffic light timing, density of registered vehicles, and other variables that are unpredictable and extraordinary events, such as accidents. Many researchers, engineers, government organizations, and transportation agencies have been investigating and comparing roundabouts and signalized intersections. Their main concerns regarding this investigation and comparison are determining which traffic control strategy is safer, and re time- and cost-efficient.

For roundabouts, Retting et al. (2006) showed that traffic congestion, as measured by the vehicle-to-capacity ratio, was reduced by 58-84% [25]. These results provide further evidence that roundabouts can improve traffic flow and public support for roundabouts increases after they are in place. For the safety of roundabouts, Gross et al. (2013) conducted an analysis and substantiated that roundabouts have the potential to significantly reduce crashes and severity of these crashes [10]. According to Retting et al. (2001), roundabouts can significantly reduce all crash severities by 38% and all injury crashes by 76%, making them an effective safety treatment for intersections, with a focus on the United States for their study [26]. To improve the safety at roundabouts, by reviewing past crash reports and visiting several roundabouts, Mandavilli et al. (2009) established that roundabout safety can be improved by adding design features such as entry deflection on approach roads, larger 'roundabout ahead' and 'yield' signs, enhanced landscaping of central islands, reflective pavement markers, and 'yield' signs at the entrance to roundabouts [15]. Moreover, Al-Marafi etal. (2020) conducted a study with similar objectives and further corroborated that increasing the number of entry lanes, entry width, entry radius, traffic volume, circulatory roadway width, weaving width, and speed limit have positive effects on roundabout safety [2]. However, a different study by Ahn et al. (2009) demonstrated that roundabouts provide efficient movement of vehicles when the approach traffic volumes are relatively low for their case study [1]. Their finding has been consistent with other studies we will discuss in the later parts of this paper.

For signalized intersections with traffic lights, Zaji et al. (2023) showed that, based on their results, in contrast to uncontrolled intersections without traffic lights, optimized traffic lights can significantly contribute to total travel time-saving [33].

To increase this travel time-saving, Li et al. (2018) conducted a different study and proposed a traffic control strategy which established that connected and automated vehicles can use traffic light information to optimize their velocity profiles and reduce idling at red lights, resulting in a 19.2% decrease in total trip time and an 18.1% decrease in fuel consumption [11].

Without proposing any traffic control strategy, Gershenson (2004) validated that just by using simple rules and no direct communication, traffic lights are able to self-organize and adapt to changing traffic conditions, reducing waiting times, number of stopped cars, and increasing average speeds [9].

Likewise, without also proposing any traffic control strategy, Olaverri-Monreal et al. (2018) put forward that their study's results show an increase in driving efficiency in the form of improvement of traffic flow, reduced gas emissions, and waiting time at traffic lights after the drivers adjusted their velocity to the speed calculated by the Traffic Light Assistance (TLA) system [21].

For the safety of signalized intersections with traffic lights, Yannis et al. (2013) demonstrated that nighttime lighting has great potential in improving traffic safety and reducing the accident severity, particulary for pedestritians and drivers killed and seriously injured [32].

However, another study by Uttley et al. (2017) had contradictory results which suggested that there is a significantly greater risk of a pedestrian road traffic collision at a crossing after-dark than during daylight, and while 98% of these crossings are lit by road lighting, this raises questions about the adequacy and effectiveness of the lighting used [30]. By this extent, Rudin-Brown et al. (2012) took a different direction with their study and asserted that the installation of traffic lights at real-world level crossings would not be likely to offer safety benefits over and above those provided already by flashing lights with boom barriers [27].

For investigating and comparing roundabouts and signalized intersections with traffic lights, Zhou et al. (2022) argued that roundabouts have a higher capability of vehicle passing than intersections, especially for a large traffic volume [34].

Correlatively, Oh et al. (2000) conducted a study and showed that roundabouts provide more capacity than signalized intersections with traffic lights for approaching traffic of up to 1,000 vehicles per hour per direction [20]. On the other hand, five years later, Bared et al. (2005) published their study, and by utilizing a traffic simulation software, they found that roundabouts perform similarly to signalized intersections with traffic lights in terms of average delay when operating below capacity, but signalized intersections perform slightly better at heavy volumes when roundabouts are operating at capacity [3]. This contradiction raised an important question among researchers about a possible replacement of roundabouts and signalized intersections with traffic lights based on each location's unique needs and external variables. However, Daniels et al. (2008) confirmed that roundabouts that replace traffic signals perform worse when compared to roundabouts at other types of intersections most of the time [8].

For instance, according to Esťevez Mauriz et al. (2018), when a roundabout becomes unbalanced and subsequently leads to a traffic congestion, the roundabout can become noisier than a signalised crossing at signalized intersections with traffic lights [16]. For comparing the safety of roundabouts to signalized intersections with traffic lights, Nambisan et al. (2007) conducted a study, and although high volume intersections with signalized traffic controls appeared to be safer than the corresponding candidate roundabouts in their study, the results were not found to be statistically significant [19]. Conversely, Saccomanno et al. (2008) demonstrated that roundabouts yield reduced exposure times to rear-end conflicts compared with signalized intersections [28].

In conclusion, some studies suggest that roundabouts provide more capacity and reduced exposure times to rear-end conflicts compared to signalized intersections with traffic lights, especially for lower traffic volumes, while other studies show that signalized intersections perform better at heavy volumes, have shorter optimal cycle lengths, and produce lower NOx emissions.

While numerous studies have investigated the merits and drawbacks of roundabouts and signalized intersections, a noticeable gap persists in the research landscape—a comprehensive comparison of these two traffic control systems that considers dynamic variables, such as traffic light timing, vehicle density, and the impact of unpredictable events like accidents.

This research paper aims to conduct rigorous simulations and analyses to comprehensively compare and investigate the performance of roundabouts and signalized intersections withtraffic lights. Our primary focus is on providing practical insights into the selection of ap- propriate traffic control systems for diverse contexts.

Through Python-based simulations, we will examine the impact of traffic light timing and vehicle density on system efficiency and traffic flow within roundabouts and signalized intersections. By manipulating these variables, we intend to assess the speed and efficiency of both control systems under varying conditions.

The core objective of this paper is to use simulations to:

(1) Evaluate the speed and efficiency of roundabouts and signalized intersections under different traffic light timings.
(2) Analyze how changes in vehicle density influence the safety and traffic speed of these control systems.
(3) Provide empirical evidence to aid in the decision-making process for selecting the ost suitable traffic control system for specific traffic scenarios.

In summary, this study will employ Python-based simulations as a mathematical tool to directly compare the performance of roundabouts and signalized intersections. The mathematical approach in this paper focuses on practical assessments, and the results will contribute to informed decision-making in transportation planning and infrastructure development.

In this paper, we primarily utilized Python to write the codes for two different simulations: 'roundabout' simulation and 'signalized intersection' simulation. These two simulations are inspired from real-life scenarios to enhance the articulacy and comprehensibility of the paper and study for the readers. In this subsection, we introduced and detailed the simulations that we used for our study. Both of the simulations follow similar structures with varying initial conditions, rules, and parameters. These simulations are integral to our research and enable a detailed evaluation of traffic control systems in diverse scenarios.

In this part, we emulate the dynamics of vehicles within a roundabout. This simulation allows us to explore how different factors affect the efficiency and speediness of roundabouts, offering insights into their performance under varying conditions.

The roundabout simulation is designed to simulate the behavior of vehicles within a roundabout traffic control system. We initialized the simulation with the following parameters:

```
x_cars = [8, 9, 10] # Initial positions of X Car 1 - X Car 2 - X Car 3 along
↪  the X-axis
```

```
y_cars = [8, 9, 10] # Initial positions of Y Car 1 - Y Car 2 - Y Car 3 along
↪  the Y-axis
```

```
iteration_count = 0 # Variable to count the total number of iterations
```

Then, we defined these initial conditions:

(1) The cars are assumed to have no velocity and acceleration.

(2) The roundabout has a radius of 1 and center at (0,0).

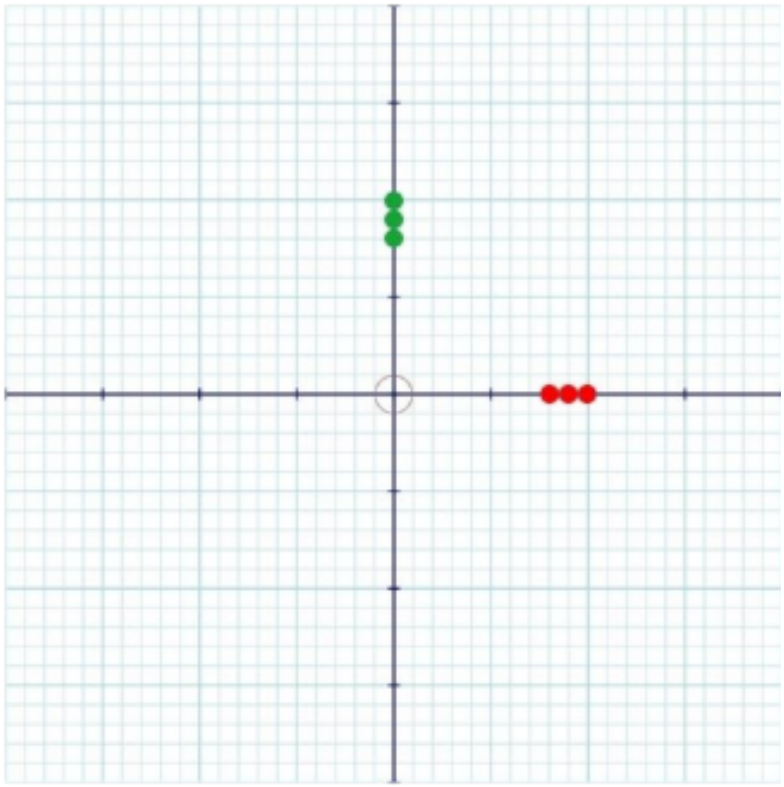
(3) All cars will be of the same type.

(4) All cars will accommodate 1 passenger.

(5) The driver behavior, such as reaction times or following distances, will be the same for all cars.

(6) Traffic-flow models are meant to describe normal conditions, while accidents are almost always caused by exceptional driving mistakes that are not part of normal driving behavior and thus not part of the intended scope of the model.

Therefore, our simulation initially will look like this:



in which red dots represent the X cars, green dots represent the Y cars, and brown circle represents the roundabout.

2.1.1.2. Rules. After setting the parameters and initial conditions, we defined these rules:

(1) There could be only one car in the roundabout at a time.
(2) Cars on positive X axis moves toward negative X axis.
(3) Cars on positive Y axis moves toward negative Y axis.
(4) It is assumed that there are no traffic lights, stop signs, lane changing, collision avoidance, and disrupting conditions such as wet ground.
(5) None of the cars will pass each other, and all of them will move in a queue-like way by being 1-unit apart.
(6) As defined specifically, iterations will be used to keep track of how many cycles or loops are required to complete the simulations with specific variables.
(7) The simulation will end when the last car is at either the point (–10, 0) or (0, –10) depending on its starting location.

After defining these rules, we also coded conditions on Python for two other important rules:

```
if not (x_cars[x] - 1) in x_cars: # Making sure that there are no cars at the
↪  left of X cars
    if x_cars[x] == 1 and 0 in y_cars: # If the current X car is at 1 and Y
    ↪  cars are at 0, X cars will not move left by one unit
        continue
    x_cars[x] = x_cars[x] - 1 # The current X Car is moving left by one unit
```

```
if not (y_cars[y] - 1) in y_cars: #Making sure that there are no cars at the
↪  down of Y cars
    if y_cars[y] == 1 and 0 in x_cars: # If the current Y car is at 1 and X
    ↪  cars are at 0, Y cars will not move down by one unit
        continue
    y_cars[y] = y_cars[y] - 1 # The current Y Car is moving down by one unit
```

In this part, we replicate the vehicle interactions at a conventional signalized intersection controlled by traffic lights. By manipulating parameters such as traffic light timings and vehicle density, this simulation enables us to analyze the behavior and performance of signalized intersections. It serves as a vital component in our comparative study of traffic control systems. As stated previously, the simulations for both roundabouts and signalized intersections follow similar structures with varying parameters and initial conditions. All initial conditions stated with codes for roundabout simulation apply for signalized intersection simulation with the addition of this condition:

```
if not (x_cars[x] - 1) in x_cars: # Making sure that there are no cars at the left of X cars
    if x_cars[x] == 1 and 0 in y_cars: # If the current X car is at 1 and Y cars are at 0, X cars will not move left by one unit
```

All initial conditions stated in a numbered list for roundabout simulation apply for this simulation except for the initial condition for roundabout shape, which is labeled as 2.

Moreover, we define another condition:

(1) The traffic lights are located at points (1, 0) and (0, 1).

Therefore, our simulation initially will look like this:

In which red dots represent the X cars, green dots represent the Y cars, and traffic light figures represent the actual traffic lights.

All the defined rules in the numbered list for roundabout simulation will also apply for signalized intersection simulation except for the rule for car behavior in the roundabout, which is labeled as 1. Moreover, these additional rules are defined specifically for this simulation:

(1) If the traffic light is red, the cars cannot move.
(2) If the traffic light is green, the cars can move.
(3) If the traffic light is yellow, it will be assumed that it does not have any affect on the simulation; thus, it will not be considered.

After defining these rules, we again coded conditions on Python for three other important rules:

```
if not (x_cars[x] - 1) in x_cars: # Making sure that there are no cars at the left of X cars
    if x_cars[x] == 1 and (0 in y_cars or traffic_light == 0): # If the current X car is at 1 and either Y cars are at 0 or the traffic light is Red in X direction, X cars will not move left by one unit
        continue
    x_cars[x] = x_cars[x] - 1 # The current X Car is moving left by one unit
```

```
if not (y_cars[y] - 1) in y_cars: # Making sure that there are no cars at the down of Y cars
    if y_cars[y] == 1 and (0 in x_cars or traffic_light == 1): # If the current Y car is at 1 and either X cars are at 0 or the traffic light is Red in Y direction, Y cars will not move down by one unit
        continue
    y_cars[y] = y_cars[y] - 1 # The current Y Car is moving down by one unit
```

```
if iteration_count % 10 == 0: # After each iteration, if the remainder is 0, the traffic light changes color
    print("Traffic Light is Changing", traffic_light)
    if traffic_light == 0:
        traffic_light = 1 # Changing the traffic light color
    else:
        traffic_light = 0
```

```
if not (x_cars[x] - 1) in x_cars: # Making sure that there are no cars at the left of X cars
    if x_cars[x] == 1 and (0 in y_cars or traffic_light == 0): # If the current X car is at 1 and either Y cars are at 0 or the traffic light is Red in X direction, X cars will not move left by one unit
        continue
    x_cars[x] = x_cars[x] - 1 # The current X Car is moving left by one unit
```

```
if not (y_cars[y] - 1) in y_cars: # Making sure that there are no cars at the down of Y cars
    if y_cars[y] == 1 and (0 in x_cars or traffic_light == 1): # If the current Y car is at 1 and either X cars are at 0 or the traffic light is Red in Y direction, Y cars will not move down by one unit
        continue
    y_cars[y] = y_cars[y] - 1 # The current Y Car is moving down by one unit
```

```
if iteration_count % 10 == 0: # After each iteration, if the remainder is 0, the traffic light changes color
    print("Traffic Light is Changing", traffic_light)
    if traffic_light == 0:
        traffic_light = 1 # Changing the traffic light color
    else:
        traffic_light = 0
```

Both of the simulations serve as mathematical models to evaluate the performance of roundabouts and signalized intersections with traffic lights under varying conditions. While these simulations do not involve complex mathematical equations, they still provide valuable insights into traffic flow dynamics and system efficiency. By manipulating number of cars and traffic light timings, we can observe how these factors influence traffic behavior.

Both of the simulations are implemented using Python as the programming language. Code snippets for both the roundabout and signalized intersection simulations have been provided in their respective sections above. These code snippets are instrumental in conducting the simulations and collecting data for analysis. Moreover, complete simulation codes for both roundabout and signalized intersection simulations can be found in 9.

As part of the simulations, we collect data on the movement of vehicles, traffic light changes, and iteration counts. Subsequently, we analyze the data to evaluate the speediness and efficiency of both roundabouts and signalized intersections with traffic lights under different conditions. In our simulations, we frequently use print function to document the results we obtain. When each simulation is concluded, in order to make inferences, we use this code to print the total number of iterations:

```
    iteration_count += 1 # Increasing the iteration count by 1 in each loop

print("Total Iterations:", iteration_count) # Printing the total number of
↪  iterations
```

We conducted a series of simulations to investigate the impact of varying vehicle density and different traffic light timings on the efficiency and speediness of roundabouts and signalized intersections with traffic lights as stated previously in 1.3. In this section, we present the outcomes of our simulations, including changes to key variables and printout results.

In our first set of simulations, we focused on varying the number of vehicles within the roundabout simulation and signalized intersection simulation while keeping other factors constant—for all simulations under this subsection, we set the traffic light timing to 4. This allowed us to assess the effects of vehicle density on comparing the effectiveness and speediness of both traffic controlling systems.

In the first comparison, we set the number of cars to 3 for both of the simulations:

```
x_cars = [8, 9, 10]
y_cars = [8, 9, 10]
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 23” printout. For the signalized intersection simulation, we received “Total Iterations: 24” printout.

In the second comparison, we set the number of cars to 4 for both of the simulations:

```
x_cars = [7, 8, 9, 10]
y_cars = [7, 8, 9, 10]
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 24” printout. For the signalized intersection simulation, we received “Total Iterations: 28” printout.

In the third comparison, we set the number of cars to 8 for both of the simulations:

```
x_cars = [3, 4, 5, 6, 7, 8, 9, 10]
y_cars = [3, 4, 5, 6, 7, 8, 9, 10]
```

```
    iteration_count += 1 # Increasing the iteration count by 1 in each loop

print("Total Iterations:", iteration_count) # Printing the total number of
↪  iterations
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 28” printout. For the signalized intersection simulation, we received “Total Iterations: 30” printout.

In the fourth comparison, we set the number of cars to 10 for both of the simulations:

```
x_cars = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
y_cars = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 30” printout. For the signalized intersection simulation, we received “Total Iterations: 36” printout.

In the fifth and last comparison, we set the number of cars to 11 for both of the simulations:

```
x_cars = [0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
y_cars = [0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 31” printout. For the signalized intersection simulation, we received “Total Iterations: 36” printout. However, after increasing the number of cars to 11, the printout results did not change for both roundabout simulation and signalized intersection simulation.

In the second set of simulations, we focused on altering traffic light timings at signalized intersections to explore their impact on traffic flow and efficiency while keeping other factors constant—for all simulations under this subsection, we set the number of cars to 4. The codes and printouts below depict the behavior of vehicles at signalized intersections with varying traffic light timings and its comparison to
roundabouts.

In the first comparison, we set the traffic light timing to 1 for both of the simulations:

```
if iteration_count % 2 == 0:
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 24” printout. For the signalized intersection simulation, we received “Total Iterations: 32” printout.

In the second comparison, we set the traffic light timing to 2 for both of the simulations:

```
if iteration_count % 3 == 0:
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 24” printout. For the signalized intersection simulation, we received “Total Iterations: 28” printout.

In the third comparison, we set the traffic light timing to 3 for both of the simulations:

```
if iteration_count % 3 == 0:
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 24” printout. For the signalized intersection simulation, we received “Total Iterations: 28” printout.

In the fourth comparison, we set the traffic light timing to 4 for both of the simulations:

```
if iteration_count % 4 == 0:
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 24” printout. For the signalized intersection simulation, we received “Total Iterations: 28” printout.

In the fifth comparison, we set the traffic light timing to 5 for both of the simulations:

```
if iteration_count % 5 == 0:
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 24” printout. For the signalized intersection simulation, we received “Total Iterations: 28” printout.

In the fifth comparison, we set the traffic light timing to 8 for both of the simulations:

After running our codes, for the roundabout simulation, we received “Total Iterations: 24” printout. For the signalized intersection simulation, we received “Total Iterations: 32” printout.

In the second comparison, we set the traffic light timing to 2 for both of the simulations:

```
if iteration_count % 3 == 0:
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 24” printout. For the signalized intersection simulation, we received “Total Iterations: 28” printout.

In the third comparison, we set the traffic light timing to 3 for both of the simulations:

```
if iteration_count % 3 == 0:
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 24” printout. For the signalized intersection simulation, we received “Total Iterations: 26” printout.

In the fourth comparison, we set the traffic light timing to 4 for both of the simulations:

```
if iteration_count % 4 == 0:
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 24” printout. For the signalized intersection simulation, we received “Total Iterations: 28” printout.

In the fifth comparison, we set the traffic light timing to 5 for both of the simulations:

```
if iteration_count % 5 == 0:
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 24” printout. For the signalized intersection simulation, we received “Total Iterations: 25” printout.

In the sixth comparison, we set the traffic light timing to 8 for both of the simulations:

```
if iteration_count % 8 == 0:
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 24” printout. For the signalized intersection simulation, we received “Total Iterations: 25” printout.

In the seventh comparison, we set the traffic light timing to 10 for both of the simulations:

```
if iteration_count % 10 == 0:
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 24” printout. For the signalized intersection simulation, we received “Total Iterations: 25” printout.

In the eighth comparison, we set the traffic light timing to 10 for both of the simulations:

```
if iteration_count % 11 == 0:
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 24” printout. For the signalized intersection simulation, we received “Total Iterations: 26” printout.

In the ninth comparison, we set the traffic light timing to 50 for both of the simulations:

```
if iteration_count % 50 == 0:
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 24” printout. For the signalized intersection simulation, we received “Total Iterations: 65” printout.

In the tenth and last comparison, we set the traffic light timing to 50 for both of the simulations:

```
if iteration_count % 100 == 0:
```

After running our codes, for the roundabout simulation, we received “Total Iterations: 24” printout. For the signalized intersection simulation, we received “Total Iterations: 115” printout.

As seen from the last three comparisons, as the traffic light timing increases, the number of iterations for the last car to reach the point either (–10, 0) or (0, –10) increases by that much.

Our simulations were accompanied by clear code visualizations and explanations to facilitate a comprehensive understanding of the results.

These visual aids and explanations were essential for interpreting the impact of varying variables on the efficiency and speediness of roundabouts and signalized intersections.

In the following sections, we delve into a detailed analysis of the results, highlighting key findings and patterns that emerged from our simulations. We aim to provide a thorough evaluation of how changes in vehicle density and traffic light timings affect the performance of these traffic control systems.

In this section, we analyze the outcomes of our simulations, considering the impact of varying vehicle density and traffic light timings on the efficiency and speediness of roundabouts and signalized intersections with traffic lights. We aim to provide a comprehensive understanding of the observed patterns, discuss the validity of our arguments, and communicate the reasoning behind our results.

The simulations we conducted in 3.1 focused on changing the number of cars while keeping other factors constant, particularly the traffic light timing which is set to 4. The results revealed these patterns:

Traffic flow is stochastic and influenced by various unpredictable factors, including driver behavior, vehicle types, and unforeseen and disrupting events. While our simulations did not incorporate these factors, they still offered valuable insights into the consistency and variability of traffic patterns. Therefore, consequently, the simulations exhibited variations in performance metrics, leading to different outcomes under similar conditions.

As we increased the number of cars, one notable observation we observed was the inconsistency in the iteration difference between roundabouts and signalized intersections. In some instances, this difference was as low as 1, while in others, it grew to 4. This phenomenon underscores the complexity of traffic interactions within simulations.

After reaching a certain vehicle density threshold (specifically, when we increased the number of cars to 11), the iteration difference between roundabouts and signalized intersections did not change. This observation demonstrates a saturation effect, indicating that the traffic systems might have reached a capacity limit beyond which additional vehicles do not significantly impact performance.

The simulations we conducted in 3.2 focused on exploring the influence of traffic light timings on traffic flow, with a constant number of cars set at 4. The results exhibited these patterns:

Traffic light timings play a central role in governing the flow of vehicles at signalized intersections. Our simulations demonstrated that when we increased the timing to 10, the system reached a point of optimal synchronization, resulting in highly efficient traffic flow.

Lower traffic light timings (ranging from 1 to 5) led to increased delays and iterations due to insufficient green time for vehicles to clear the intersection. Beyond a threshold (in this case, 10), further increases in green time did not proportionally reduce delays, resulting in a consistent increase in iteration differences.

Our findings highlighted the interrelated and complex interactions between traffic light timings, vehicle densities, and their impact on traffic flow. Seemingly unexpected results, such as the pattern observed until a traffic light timing was set to 5, underscore the complexity of traffic simulations and the role of multiple variables.

As stated in 1.3, our research objectives focused on assessing the efficiency and speediness of roundabouts and signalized intersections under varying conditions. While our simulations revealed unpredictable and interesting patterns, they also offered valuable insights into the nuanced dynamics of traffic control systems.

The complex nature of traffic simulations provides opportunities for further investigation. Future studies could explore additional variables and factors that may influence traffic flow and shed more light on the observed patterns. Additionally, real-world data collection and validation of simulation results could provide a more comprehensive understanding of traffic control systems.

In summary, accompanied by clear code visualizations and explanations, our simulations have contributed to our understanding of the performance of roundabouts and signalized intersections. The variations observed underline the intricate nature of traffic flow, emphasizing the need for continued research and the importance of traffic engineering in optimizing transportation systems.

While we conducted our simulations and drew inferences from them, it is still essential to acknowledge the boundaries of our approach and simulations. While our study provided valuable insights, it is important to recognize the limitations within which our findings can be applied. We grouped the following limitations into four categories:

Simplifications in Simulation.

Homogeneous Vehicle Properties. Our simulations assumed uniformity in vehicle driving behaviors, car properties, and traffic characteristics, which may not fully represent the real-world traffic diversity.

Simplified Environment. We conducted our simulations in a controlled and simplified environment, devoid of external factors such as weather conditions or road obstructions.

Traffic Control System Assumptions.

Lack of Yellow Phase in Traffic Lights. We did not consider the “yellow” phase in our signalized intersection simulation, which prevented our simulations from demonstrating realistic traffic light transition and affected intersection dynamics.

Location-Specific Traffic Light Timings. Fixed traffic light timings in our simulations did not account for location-specific adjustments based on different traffic regulations and conditions, time of day, or intersection characteristics.

Vehicle Behavior and Realism.

Velocity and Acceleration Variability. Variability in individual car velocities and accelerations, which can significantly influence traffic dynamics, was not considered in our simulations.

Realistic Speed Changes Near Traffic Control Systems. Speed adjustments that occur as vehicles approach traffic control systems were not modeled and considered, although they impact overall system efficiency and speediness.

Scope and External Factors.

Roundabout Size and Rules. Our study focused on a single standard roundabout size and a specific set of rules governing vehicle movements, which does not account for the diversity of real-world roundabouts.

Scope of Simulation Variables. While we examined vehicle density and traffic light timings, various other factors—such as road geometry, lane configurations, and driver demographics —were beyond our study's scope.

It is important to note that these limitations underscore the simplified nature of our simulations. While our simulations may not fully replicate real-world complexity of traffic dynamics, our study still provided valuable insights and laid the groundwork for future research in traffic engineering.

In the previous topics, we introduced and detailed our study by investigating the results we obtained and limitations we acknowledged. In this section, we talk about the key findings and implications of our study, while shedding light on the efficiency and speediness of roundabouts and signalized intersections under varying conditions. We also emphasize the significance of our work and its contribution to the field of traffic engineering.

Key Findings. Our simulations, while acknowledging their simplified nature, uncovered several noteworthy findings:

Traffic Flow Complexity. Traffic flow is inherently stochastic, influenced by numerous dynamic variables such as driver behavior, vehicle diversity, and external factors. Despite our simulations and models being simplified, our study revealed the complex nature of traffic dynamics, highlighting the challenges in replicating real-world conditions.

Varying Vehicle Density. The influence of vehicle density on the performance of roundabouts and signalized intersections showed unpredictable results. While an increase in vehicle density generally favored roundabouts, our results showed that the iteration differences varied, emphasizing the stochastic nature of traffic flow.

Traffic Light Timing Optimization. Our simulations underscored the essential role of traffic light timings in governing intersection efficiency. Notably, we found that increasing the timing to 10 led to optimal synchronization and highly efficient traffic flow, demonstrating the potential for optimization in signalized intersections with traffic lights.

Implications and Future Directions. These key findings hold significant implications for traffic engineering and transportation planning. As the number of studies conducted on this topic gradually increases, several opportunities for further research and practical application emerge:

Real-World Validation. Our study serves as a foundational exploration of traffic dynamics, albeit simplified. Therefore, future research can focus on validating our findings through real-world data collection and analysis, while providing a bridge between simulations and practical implementation.

Advanced Simulation Models. The complexity of traffic flow guarantees the development of more advanced simulation models that consider individual car behavior, diverse vehicle properties, and real-world traffic conditions. Such models can offer enhanced accuracy in predicting traffic dynamics.

Location-Specific Traffic Control. Adjusting traffic light timings to location-specific factors, such as traffic regulations and intersection characteristics, has the potential to optimize traffic control systems further. Research in this direction can contribute to more efficient urban planning.

In conclusion, our research advances our understanding of traffic control systems' performance, even within the constraints of being simplified simulations. While we acknowledge the limitations of our approach, our study lays the groundwork for future investigations and underscores the intricate dynamics of different variables in traffic engineering.

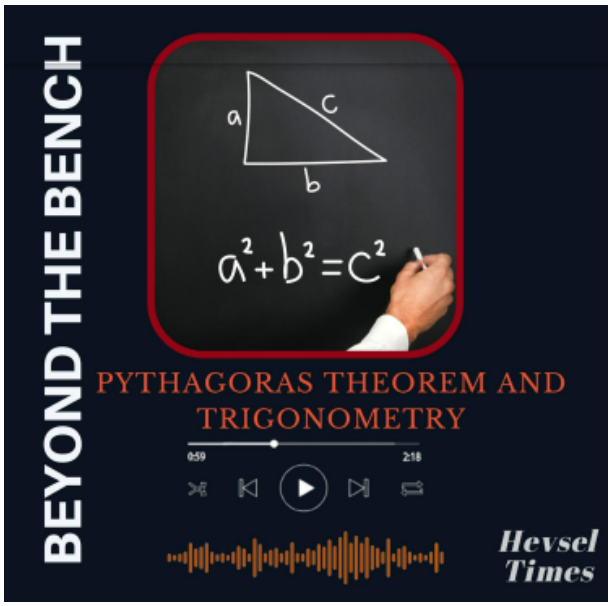
Thus, we encourage researchers and practitioners interested in this dynamic field to delve deeper into it and explore innovative solutions to enhance the efficiency and speediness of current transportation systems. By continuing to bridge the gap between simulations and real-world applications, we can pave the way for more sustainable and streamlined traffic management.

YOUTUBE CATALOGUE

Israel-Palestine Conflict: Explained provides a historical overview of the Israel-Palestine conflict, highlighting major events and wars from the early 20th century to the early 2000s, emphasizing the ongoing disunity and turmoil in the region.

Will Dune: Part 2 Dominate The Film Industry? provides an overview of Dune: Part Two, its major actors, plot summary of both Dune films, and discusses the potential success of the sequel in the film industry.

PODCAST CATALOGUE

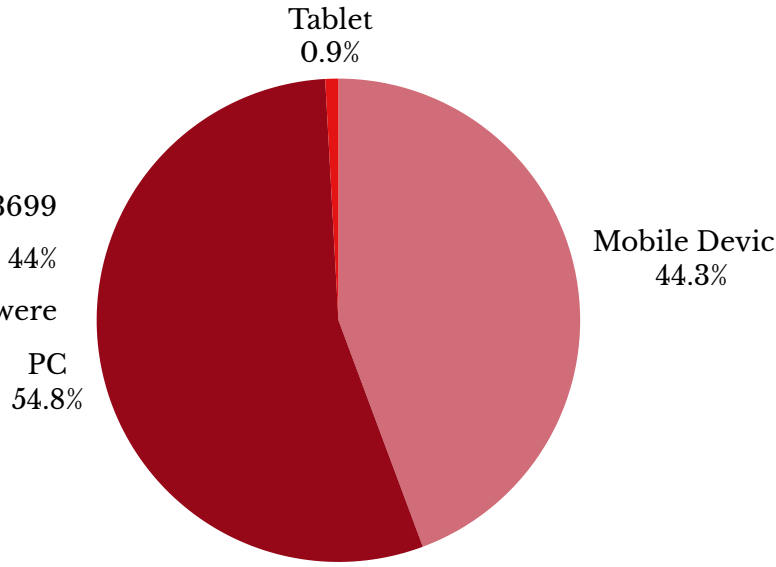


Beyond the Bench: Pythagoras Theorem and Trigonometry explores the profound impact of Pythagoras' theorem on the development and understanding of trigonometry.

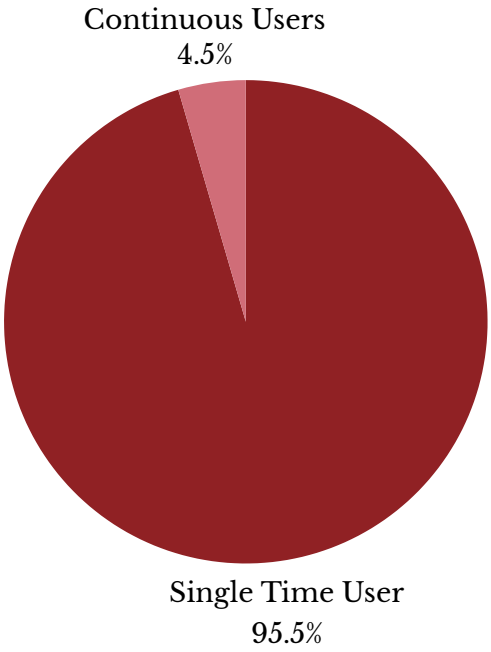
Science in a Twist: Japanese Culture explores the evolving beauty standards and aesthetic ideals in Japanese culture, focusing on the Heian and Edo periods, and discusses the influence of globalization on contemporary Japanese beauty standards..

STATISTICS

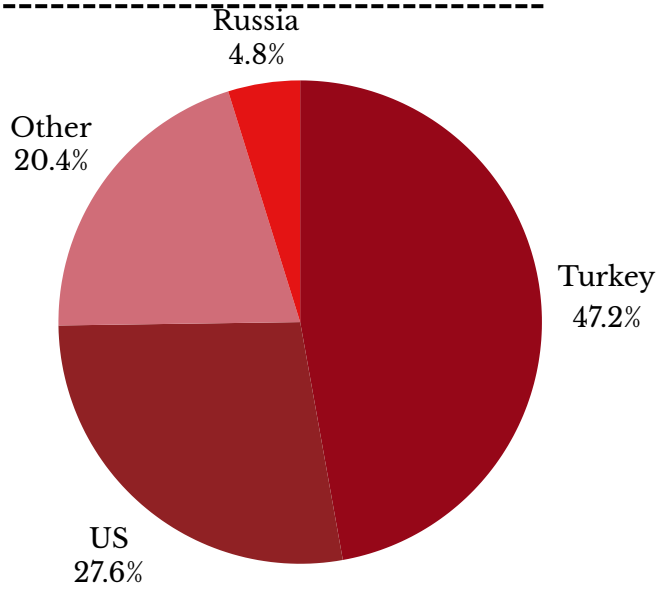
This year, Hevsel Times was visited for 3699 times. 55% of these visits were made by PC users, 44% were made by Mobile Device users and the 1% were made by Tablet Users.



This year, 2845 users visited the Hevsel Times website. While 911 of these users visited once, 43 of them visited our website more than once.



Approximately 1745 of our visitors were from Turkey. Meanwhile, around 1021 visits were made from the US, 178 visits were made from Russia, and 755 visits were made from the rest of the world.



PROJECTS

As Hevsel Times, we value projects that cater to work for the betterment of our society, protection of our planet, and preservation of our culture. Therefore, we support several projects, such as:

Cosmopolitan Library

The Cosmopolitan Library documents underrepresented cultures, including Kurdish heritage, and provides accurate information through scholarly articles. It aims to create a lasting resource for future generations by preserving diverse cultural histories and promoting understanding.

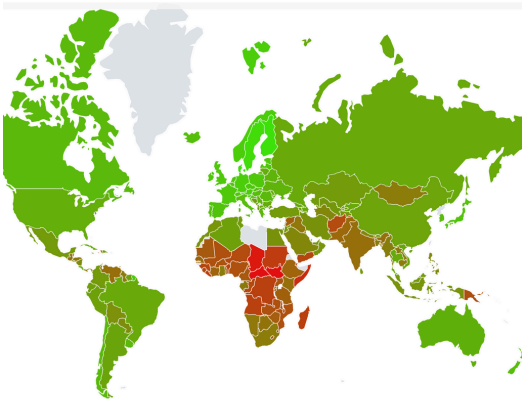
Technohear

TechnoHear is a platform designed to bridge gaps in technological access and understanding. It aims to enhance digital literacy and connectivity by providing resources and training to underserved communities, ensuring they can fully participate in the digital age.

PROJECTS

Around the Globe

Around the Globe is an interactive world map on our website, created by Hevsel Times to celebrate our students' global success. Each country on the map features photos and success stories of our students studying at top universities, allowing you to see and be inspired by their achievements.



SDG Map

Sustainable Development Map serves as a way to learn more about the developmental levels and development based issues of countries all over the globe. This way, more people become knowledged regarding global issues, such as poverty and natural disasters.

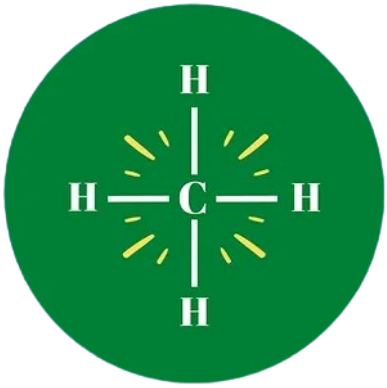
Via these projects, Hevsel Times contributes to the preservation of our planet, promotion of unknown and dying cultures, and protection of groups in need, becoming a successful project hub.

INITIATIVES

Hevsel Times supports several initiatives that cater to better their environment and society in unique ways, providing its society with value.

Animal Savehicle

Animal Savehicle develops a sensor-based circuit to detect and deter animals. If any of the sensors detect the animal, the system warns the driver and sends sound waves to deter this animal.



Metharise

MethaRise represents a comprehensive worldwide climate initiative devised to mitigate methane emissions.

Firmocret

Firmocret reaches out to earthquake victims, supports the students in earthquake zones with educational material, and develops a sustainable, feasible, zero-waste, and durable concrete.

INITIATIVES

Hemi Change

Hemi Change is a sustainable plastic produced from hemicellulose and glycerol in order to respond to widely known problems of plastic products.

Delavo

Delavo developed ECaundry—water filtration apparatus designed to be implanted within the washing machines to manage their water and energy use.

Taxikonomi

Taxikonomi is a podcast series in which Turkish people from different social classes are interviewed. Taxikonomi examines how the ongoing financial crisis affected them.

Neurolize Youth

Neurolize Youth aims to “neurolize” the next generation by creating accessibility and empowerment as they unlock the mysteries of brain and behavior.

CREW QUOTES

Gul Karen Aca

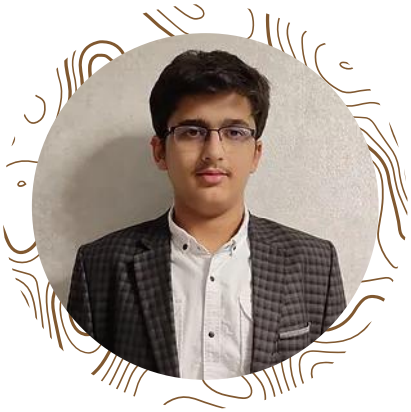
"Since its founding, Times catered to globally represent the cultural values, issues, needs, and traditions of its region and raised awareness; and it will always take pride of this."

Yigit Efe Nas

"With dedication, Hevsel Times greatly diversified and raised the quality of its content. I firmly aspire the continuation of our satisfaction in the future."

Elif Gulce Batgi

"Hevsel Times expanded beyond its region and built its' own vision. I believe Hevsel Times will keep raising awareness with its passion."



Bedirhan Atabay

"As the biggest student journal of Southeastern Anatolia, Hevsel Times shares the less known traditions and visions of its region, and I am proud of partaking."

TIMES JOURNAL

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