Predicting a safety score for Women in Costa Rica
Challenge Provider: Urbanalytica

Urbanalytica is a collaborative platform of urban innovation run by women specialized in urban planning. It currently is supported by a group of 10+ collaborators with backgrounds that include engineering, architecture and social sciences, among others. This team is made up of people from different parts of the world whose common goal is to further goal 11 of the Sustainable Development Goals.

Our mission is to work for the development of smart, sustainable and just communities. Our methodology is interdisciplinary and collaborative, based on emerging technologies and sustainable development.

Context

According to a study by the United Nations Entity for Gender Equality and the Empowerment of Women, Gender violence in cities, specifically in public spaces, has become an increasingly public issue, especially in Latin America. The lack of adequate urban infrastructure, policies, and governance models exacerbates it. Thus, addressing the main obstacles women face regarding their right to an inclusive and safe city, becomes a priority.

Police statistics have shown that 70.6% of the complaints of street sexual harassment in Costa Rica in 2019 were submitted by women. While no current strategy from the public authorities is in place, women are raising their voices creating awareness groups on social media to report aggressions, missing persons, etc. This is why we wish to give women a mapping tool to identify but also report whenever they feel like their right to enjoy public spaces without being harassed is being threatened.

Further Background Information

Tools like this already exist in other parts of the world, for example in India the Red Dot Foundation created the SafeCity web app (https://reddotfoundation.org/).

There are also several scientific research papers available about the factors for safety in cities, for example:
- Environmental factors like weather and air quality:
  https://www.jstor.org/stable/26329867 (only abstract available)
- Street lighting: https://link.springer.com/article/10.1007/s10940-020-09490-6 (only abstract available),
  https://www.sciencedirect.com/science/article/pii/S0198971516304240 (full paper available)

- Heatmaps to identify areas prone to violence can be constructed using household survey data: https://crimesciencejournal.biomedcentral.com/articles/10.1186/s40163-020-00125-6 (full paper available)
- Configuration of the street network: https://link.springer.com/article/10.1007/s10940-016-9306-9 (full paper available)
- Spatial features in urban environments: https://crimesciencejournal.biomedcentral.com/articles/10.1186/s40163-020-00125-6 (full paper available)

Other resources:
- Urban design and crime prevention information from the UK government: https://www.crimeprevention.vic.gov.au/resources/urban-design-and-crime
- Analysis of violence against women in Costa Rica in 2020: https://infosegura.org/en/2021/06/18/violence-against-women-costa-rica-2020/

Goal

With this challenge we want to address poor conditions, insecurity and gender violence in public spaces where citizens who identify themselves as women and girls can find useful information that supports their daily activities in public spaces.

Sustainable Development Goal

GOAL 11: Sustainable Cities and Communities
Target 11.7: Provide access to safe and inclusive green and public spaces

Outcome

The outcome of this challenge is two-fold:
1. Create a safety index/metric based on the data in Costa Rica.
2. Predict the trend of the safety index/metric per geographic zone by trimester and by year.

Available Resources

All the data resources can be found here:
https://wdl-data.fra1.digitaloceanspaces.com/urbanalytica/urbanalytica_datasets.zip

The description of the datasets can be found in the data dictionary.

As a reminder, you can also use any data that is open, free and legally available.

Besides the data, the following resources are available:
- Demographic Data: https://www.inec.cr/
- Several Maps of the Costa Rican Ecosystem (land use, vegetation, paving etc): https://atlas-servicios-ecosistemicos-gam.github.io/

Tips

- **Special consideration:** When dealing with sensitive issues, such as the prediction of safety/crime, it is very important to consider the explainability and fairness of your model. Make sure that you explore both and include any mitigation strategy needed to be considered.
- How big should be the geographical zone: You can define it based on what you would like to include. It should be at least at a district level.
- When creating the index, make sure that it is backed up by previous research on safety factors in cities.
- OpenStreetMaps is your friend: You can download a lot of information from which you can extrapolate the safety factors.
- If you find it overwhelming to work on the whole country, feel free to focus on the province or canton of San José, since it's the capital of the country and where more data can be found online.
- Keep in mind that Spanish uses some characters that might get corrupted in datasets.
- You can browse the arcGIS data visually under these two links:
  - https://msjcr.maps.arcgis.com/apps/webappviewer/index.html?id=2fee9920df334d6688c2eaf0e749349c
  - https://msjcr.maps.arcgis.com/apps/webappviewer/index.html?id=7da481f022c74e79882ca6052afad0ba

Submissions

Deadline: Monday, 23rd of May 23h59 AoE (Anywhere on Earth)

Don't forget that you will need to submit the solution report (notebook template with the link below) and executive summary (markdown template below). You also need to submit a **3-minute** video summary of your solution.

Solution report template: https://bit.ly/wdl_2022_jupyter_template
Executive summary template: https://bit.ly/wdl_2022_exec_sum