**Hear & Now**

**Group 6**

1. **Biodiversity focus**

Our goal is to develop an interactive web application where the users can get an immersive experience in the Achterhoek region. Notably, we want to provide the users with information about the bird diversity in the region, its relationship with the ecosystems found there and the effects of agricultural pressure on the habitat loss of the birds that are present in the area.

The web application will give this immersive experience by scaling down from satellite imagery to terrestrial laser scanned data with which the user, like a bird, will get the feeling of flying to their home habitat. The habitats that the user will be able to fly to are forests, crops, wetlands and urban areas. For each of these four areas an analysis of the vegetation present will be done by mixing vegetation indices (retrieved from UAV (Unmanned Aerial Vehicles) imagery) and forest structure variables (Retrieved from MLS (Mobile Laser Scanning)). Finally, the recording of birds singing will be available to listen for each of the habitats with one list of the bird species that were found during our visit to the area and another list of the birds that have been observed recently near this area (Citizen science data retrieval from eBird).

1. **People**

Objective personas for the interactive map application include various stakeholders interested in bird biodiversity and forest conservation. We are targeting people who are enthusiastic about nature, they care about preserving the biodiversity in the area and therefore are possible participants in nature conservation. We have categorized them into three different types of nature enthusiasts described below.

Afbeelding met tekst, Menselijk gezicht, persoon, person

Automatisch gegenereerde beschrijving

1. **Purpose**

The application aims to enhance people's awareness of bird biodiversity, raise awareness of the importance of biodiversity, and assist in the formulation of habitat management strategies. A immersive and interactive visualization is able to show the bird biodiversity situation, at the same time it is able to educate the users and also engage the users to contribute to the project and record audio files. Below a more detailed way of how these purposes will be achieved is described.

1. Comprehensive biodiversity assessment: The project aims to assess the biodiversity of different areas from three perspectives: Lidar 3d structure, biodiversity indices, habitat characteristics, and AudioMoths. Mobile Lidar provides detailed 3D information about forest structures, identifying and visualizing different vegetation layers, canopy density, and tree species composition. The obtained point cloud data is crucial for showcasing the habitats of different bird species. Biodiversity indices and habitat characteristics offer a holistic visual assessment of bird species distribution in the study area based on spectral data. AudioMoths capture acoustic data to capture the unique acoustic characteristics of various bird species. The combination of these datasets enhances the accuracy and richness of bird biodiversity assessment according to measured habitat characteristics.
2. Interactive visualization and engagement: The development of an interactive map allows users to explore bird biodiversity data in a user-friendly manner. By clicking on specific locations on the map, users can access 3D models of the trees where birds reside and listen to their unique vocalizations. This interactive experience fosters a deeper understanding and appreciation of bird species and their habitats.
3. Conservation and education: The interactive map serve as a valuable tool for educators, nature enthusiasts, and conservationists. It can be used to identify important bird habitats, their characteristics, track changes in bird populations over time, and raise awareness about the importance of bird biodiversity. Additionally, the data collected through the application can help in identifying critical habitats, areas of high biodiversity, and potential threats to the ecosystem. This knowledge can assist policymakers, environmentalists, and land managers in making informed decisions to protect and sustainably manage forest resources
4. **Personal motivation**

Climate change and industrialization have brought many drivers of biodiversity loss and we are in a critical moment for preservation of bird diversity as the recent article from Rigal & al. (2023) shared alarming results about bird decline in Europe. Biodiversity brings many ecoservices to humans and helps preserve the ecosystems, but we also care about the animal cause, the different species preservation and interspecies justice. One of the ecoservice of birds is also cultural recreation, some of us have interests in birdwatching and by understanding the bird species distribution and their habitat characteristics and by creating an immersive experience we want to recreate the feeling of exploration and share it.

In addition to that we are all also very interested in the technical execution of this project creation. We choose to work with audiomoth to add another dimension to the usual spatial dimensions we work with and go beyond our current knowledge to expand immersion possibilities.

**References**

Rigal, S., Dakos, V., Alonso, H., Auniņš, A., Benkő, Z., Brotons, L., Chodkiewicz, T., Chylarecki, P., de Carli, E., del Moral, J. C., Domşa, C., Escandell, V., Fontaine, B., Foppen, R., Gregory, R., Harris, S., Herrando, S., Husby, M., Ieronymidou, C., … Devictor, V. (2023). Farmland practices are driving bird population decline across Europe. *Proceedings of the National Academy of Sciences*, *120*(21), e2216573120. <https://doi.org/10.1073/pnas.2216573120>