



## Unraveling the Impact of Human Activities on Wildlife: An AI Powered Multimodal Data Analysis

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**Abstract:** In an era defined by climate change and rapid urbanization, the interplay between human activities and wildlife has intensified, frequently instigating conflicts and disturbing the equilibrium of natural ecosystems. The effects of sound and light pollution, which are integral to these interactions, are frequently understated, despite their potential to disrupt wildlife. This project, therefore, proposes the deployment of artificial intelligence (AI) and machine learning (ML) techniques to discern and quantify the consequences of human activities, including movement, sound and light pollution, on wildlife behavior and their habitat utilization. The research is motivated by a commitment to social good and a profound respect for all life forms. By developing AI solutions to monitor and mitigate the impact of human activities on wildlife, we aim to foster a more equitable coexistence between humans and other species, thereby advancing social justice and ethical considerations in technology development. Our work will promote transparency by revealing the often hidden costs of human activities on wildlife and habitats. It will also empower individuals and communities to make more informed decisions about their behavior and its potential environmental consequences, fostering greater social consciousness and accountability. By ensuring the privacy of individual data during the implementation of our AI models, we intend to uphold the principles of data ethics and privacy. Additionally, the project will be designed with inclusivity in mind, considering the impact of sound and light pollution on a broad range of species and habitats. Finally, the project will involve diverse stakeholders, including local communities, policy makers, and conservationists, in the process of developing and implementing AI solutions. By doing so, we aim to ensure that our research not only contributes to scientific understanding, but also meaningfully advances the cause of social good, justice, equity, and sustainability.

### Research Questions:

- R1: What patterns can we discern in large-scale human activity data that relate to the frequency and intensity of human-wildlife interactions and conflicts?
- R2: How can the impact of different types of sound and light pollution on wildlife behavior and visitor experiences in protected areas be quantified and predicted?
- R3: What are the optimal strategies for managing soundscapes and lightscapes in protected areas to enhance both wildlife conservation and visitor satisfaction?



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## **Big Ideas Grant**

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- R4: How can adaptive management strategies for protected areas be designed considering the dynamic nature of human activities and wildlife responses and effectively communicated to visitors?